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# Reciprocal teaching and its effect on inference skills to enhance reading comprehension

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**RECIPROCAL TEACHING AND ITS EFFECT ON INFERENCE SKILLS TO**

**ENHANCE READING COMPREHENSION**

by
Amber Rosenberger

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Science in Teaching Degree
of
The Graduate School
at
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Thesis Chair: Marjorie Madden, Ph.D.

# Abstract

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RECIPROCAL TEACHING AND ITS AFFECT ON INFERENCE SKILLS TO
ENHANCE RADING COMPREHENSION
2010/2011
Marjorie Madden, Ph.D.
Master of Science in Teaching

The purpose of this study is to determine how the use of reciprocal teaching affects the learning of inference skills in four, 4th grade excel readers. By utilizing reciprocal teaching as the instructional component and incorporating engaging read alouds, this study seeks to determine how these effect the development of inference skills. The students in this study received explicit instruction about inference skills and the reciprocal teaching model. Students participated in daily read alouds and reciprocal teaching for twenty minutes over the period of four weeks. Through teacher observations, focus group discussions, excerpts from teacher research journal, and video clips the study showed some increase in inference making among focus group participants. Out of four focus group participants, all participants increased their ability to make inferences in reading. The findings of this study suggest that read alouds along with reciprocal teaching, teacher questioning, and reader's schema effect students' development of inference skills in reading.

## Acknowledgments

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Chapter 1

Introduction


*If teachers can slow down their thinking and notice what they do as expert readers of their content, they will know how to design effective reading strategy instruction. They can show students through modeling their own reading process how proficient readers attack different kinds of texts.*
-Chris Tovani


In this fast paced world that we live in, the waiting time before receiving what we request and desire has been sped up to almost instantaneous because of the technological advances made- scholarly articles and passages of books through the library databases online, updates and immediate responses through text messages and emails received from one's cell phone, and remote starters to heat, cool, and start one's car. Education, like everything else in our society has been forced to adapt to our fast paced lives. In addition, when problems arise, our society prefers instant and quick solutions. People don't like to wait anymore and one could expect United States' citizens to say, "We don't have time to wait for gradual change; we need it now!"

So, when the United States students' academic performance dropped from its ranking as number one in the world to average, the solution was to 'teach for the test' in order to improve standardized testing scores for reading, writing, and math in hopes to regain its top ranking. As of 2009 the OCED Program for International Student Assessment (PISA) reported that the "U.S ranked 14th in reading, 17th in science, and 25th in mathematics" out of the total 34 OCED countries (Zeitvogel, 2010). The National Center on Education and the Economy (NCEE) suggests that the United States can

improve its ranking "by using the educational strategies of successful nations [and recommends] students to pass gateway tests" used in other countries thriving in education (Koebler, 2011). These gateway tests are unlike the standardized tests that the United States is familiar with. NCEE states how the gateway exams are "very high quality, they cannot be 'test prepped;' the only way to succeed on them is to actually master the material" (Koebler, 2011). This indicates that the United States' needs to reevaluate how they assess the academic performance of its students' which could affect the types of educational strategies used with the schools. Though standardized tests are needed, thorough instruction and practice of skills are also essential in the learning process of United States' students. There should be checks and balances to assure that the one component does not outweigh the other, since both are equally as important for the success of our children in education.

Purpose of Statement

One of the reasons why the United States may be ranked average in reading could be the results of students' performance in overall reading comprehension of various texts.

According to the National Assessment of Educational Progress reading tests in 2003, "many young adolescents [struggled] with reading comprehension of academic texts [for the reading tests in 2003]; 26% of American eighth-grade students performed at the *below basic* level" (National Center for Education Statistics, 2005). Though reading comprehension is a very complex conception, there is one aspect that teachers have control over…the instructional component for reading comprehension strategies that support children's reading comprehension of texts. One of the most effective instructional approaches that teachers can use to increase his/her students' reading comprehension of

academic texts is reciprocal teaching (National Institute of Child Health and Human Development, 2000). Palincsar and Brown (1986) found that reciprocal teaching increased the reading comprehension of students from 30% to 80%; a 50% increase. Since the 1980s, many studies continue to test the efficiency of reciprocal teaching. The outcomes of these studies remain positive its implementation within different settings, age groups, and populations (Hart & Speece, 1998; Le Fevre, Moor, & Wilkinson, 2003; Lysynchuk, Pressley, & Vye, 1990).

Another plausible cause affecting the declined performance of United States' students' in reading could be the consequence of the limited instruction and opportunities for the students to apply higher-order thinking strategies to their readings. Lauer (2005) proposes "that teachers may not know how to incorporate critical thinking into their lessons." Drapeau (2009) found that teachers felt like they lacked the knowledge and confidence to properly teach higher-level thinking skills. More specifically, inference is a very challenging higher-level thinking skill to teach, since it involves 'thinking about thinking' or metacognition. Guszak (1972) recorded in his study how teachers tended to ask more "direction literal comprehension questions about five times as often as inferential questions," which produced a higher student performance "on literal than inferential questions." Even though researchers have stated that inferential comprehension is more difficult for children than literal comprehension, again the type of educational strategy the teacher decides to use is the key component that will help address the reading issue in America (Hansen & Pearson, 1983). Dole et al. (1991) recommends "using explicit instruction to provide students with an explanation of what they will be learning, followed with guided practice, and opportunities for the students to

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use what they have learned on their own" (Kopitski, 2007, pp. 20-21) as an effective

teaching approach for teaching inference. McGee and Johnson (2003) support this notion

from the results comparing two types of instruction. An 'active' group of pupils were

trained to derive all the implicit meanings themselves (through teaching and practice in

integration of prior-knowledge with text concepts) while a 'passive' group were given all

the inferences in an overview by the teacher." They discovered that inference training

raised performance in less skilled comprehenders by 20 months, while comprehension

practice had resulted in an improvement of 10 months (Kispal, 2008).

Nevertheless, there is a correlation between inference and overall reading

comprehension. Suh and Trabasso (1993) state, that inference is the glue that cements the

construction of meaning. Anderson and Pearson (1984) suggest that overall reading

comprehension can improve when students know how to infer texts, since they believe

that inference is "the overall process of comprehension". Other researchers, such as Caine

and Oakhill (1999) and Keen and Zimmerman (1997) agree that inference is a crucial

strategy needed to comprehend text. However, inference should not be taught in isolation

(Kopitski, 2007). The Report of the National Reading Panel (2000) states, that "it is most

effective when a variety of reading strategies are learned together" in order to improve a

student's ability to infer text.

<center>Statement of Research Problem and Question</center>

Subsequently, the predicament lies with addressing both teaching inference skills

and improving students' overall reading comprehension through an educational strategy

that is equally beneficial and suitable for teachers to use within their classrooms. In

addition, this teaching method should produce more qualitative measurements, since there is a possibility that in the near future the United States will opt to use 'gateway tests' similar to those used by other leading countries in education.

One instructional approach used to improve overall reading comprehension and use of various reading strategies is reciprocal teaching. Since its origin in the 1980s, reciprocal teaching has produced time and time again positive outcomes towards improving reading comprehension. Rosenshine and Meister (1994) concluded that reciprocal teaching improves reading comprehension, after reviewing 16 studies of reciprocal teaching. Furthermore, Doolittle, Hicks, Triplett, Nichols, and Young (2006) commended "the flexibility and transferability of the reciprocal teaching strategy", which suggest that reciprocal teaching can be used to address other reading strategies besides questioning, predicting, clarifying, and summarizing.

Consequently, is it possible that reciprocal teaching, which is used to address the reading strategies of questioning, predicting, clarifying, and summarizing, could also be utilized to teach inference, a higher-level reading strategy? Yes, there are very limited studies that suggest this incorporation of inference into the reciprocal teaching method is possible. Cromley and Azevedo (2007) suggest it's possible through their research using the Direct and Inferential Mediation (DIME) model. This process focused on the "relationship among background knowledge, inferences, reading comprehension strategies (i.e. summarizing), vocabulary, and word read['s] effects…on comprehension" (Cromley and Azevedo, 2007). The study found that "all five predictor variables made significant contributions to reading comprehension, directly and/or mediated by strategies and inference" (Cromley and Azevedo, 2007). Another supporter is David Hicks who did

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a case study labeled: *Facilitating Historical Inquiry in the Social Studies*, which incorporated inference in a modified version of reciprocal teaching to teach students how to analyze historical sources (Doolittle, Hicks, Triplett, Nichols, and Young 2006, p.110). The findings for this case study illustrated ways that this altered style of reciprocal teaching proved effective for students as they analyzed historical sources.

Similar to Hicks' study, I will be using a case study for my thesis to examine reciprocal teaching and its possibilities for teaching inference skills to enhance reading comprehension.

Organization of the Thesis

Chapter 2 provides a review of the literature on reciprocal teaching, teaching inference skills, graphic organizers, and incorporating the reading strategy inference into the reciprocal teaching model. Chapter 3 will describe the context of the study and research design. Chapter 4 analyzes the data and discusses the results of the study. The final chapter 5 presents the conclusion and findings of the study as well as implications for teachers and education.

Chapter 2

Review of the Literature

*"For us to be able to make a cohesive cloth, we would need to be taught the weaving process step by step. We would need to watch a proficient weaver, then attempt to mimic her movements while she held our hands in the correct position. We'd need her to watch over our shoulder and instruct us as we tried it out on our own. And as we gained skill, we'd still need that expert to oversee our work and make suggestions along the way. After all these experiences, we might finally be ready to weave a decent cloth completely on our own."*

(Kelly and Clausen-Grace, 2007, p.3)

Reciprocal teaching is a procedure which aids the instructional process through dialogue between the teacher and students on the following reading strategies: questioning, predicting, clarifying, and summarizing. It is a teaching activity that has acquired much popularity since its origin in the 1980s. This tactic has been implemented within grades K-12, as well as, at the college level. It has produced positive results for all of the above educational levels within the four reading strategies of questioning (Lederer, 2000; Rosenshine, Meistry & Chapman ,1996), predicting (Greenway, 2006; Field, Anderson, & Pearson, 1990; Hansen, 1981), clarifying (Todd, 2006), and summarizing (Allen, 2003). It is a type of instructional activity that shifts the teacher role from the instructor to the possession of the students. Each student is given the opportunity to take on the position as teacher. The students alternate the teacher role amongst their peers by asking, "Who wants to be the next teacher?" As the teacher, the student reports his/her metacognitive thinking to his/her peers about the text. Then the students, as a whole,

begin to discuss questions and settle disputes by rereading the text. Lastly, the student

playing the teacher role summarizes, clarifies, and predicts the text read thus far and what

is to come. As a result, the individual and whole group reading comprehension is fostered

through this procedure.

Is it possible that reciprocal teaching, which is used to address the reading

strategies of questioning, predicting, clarifying and summarizing, could also be utilized to

teach inference, a higher-level reading strategy? On a weekly basis, teachers attempt to

engage their students in various readings, as well as, assessing their reading

comprehension by initially using reciprocal teaching to foster engagement and

comprehension. Consequently, reading engagement and reading comprehension through

questioning, predicting, clarifying, and summarizing are increased. When it comes to

engaging students in texts using reading strategies that involve higher-level thinking

(analyze, evaluate, and create) to promote comprehension, it is not particularly clear how

thinking and reasoning should be taught. Therefore, the students are usually given the

definition of these higher level reading strategies (analyze, evaluate, and create) and

expected to respond accurately when they do arise in their 'think and response' questions.

Guszak's 1972 study supports this discrepancy  between students' higher-level

thinking capability and required curriculum ability from documenting how teachers tend

to ask more "direct literal comprehension questions about five times as often as

inferential questions," which produces a higher student performance "on literal than

inferential questions" (Guszak 1972, as cited in Hansen, 1981, p. 392). Therefore,

inference is a comprehension strategy that needs explicit instruction (think aloud and

modeling) to improve students' abilities to infer information (Hansen, 1981; Hansen & Pearson, 1983; Mantione & Smead, 2003; Raphael & Wonnacott, 1985).

The first part of this chapter centers on what reciprocal teaching is and how researchers and scholars have viewed reciprocal teaching and its development over time. The second section focuses on how and why it is important for teachers to teach inference skills as well as the benefits for teaching inference strategies through reciprocal teaching. The third portion of the chapter focuses on the need and benefits of inference charts, types of graphic organizers. The final component of the chapter discusses how this study will add to the existing limited body of research on reciprocal teaching for instructing the inference strategy. Likewise, it addresses how the use of reciprocal teaching for expanding inference should be studied further due to its potential to increase the positive engagement and knowledge about inferring text.

## What is Reciprocal Teaching?

The founders of reciprocal teaching, Annemarie Sullivan Palicsar and Ann L. Brown, define reciprocal teaching as follows:

*Expert scaffolding and proleptic (in anticipation of competence) teaching; in the context of instruction refers to situations where a novice is encouraged to participate in a group activity before* [one] *is able to perform unaided, the social context supporting the individual's efforts.*

*Literacy for the 21st Century A Balanced Approach* by Gail E. Tompkins reiterates Palicsar and Brown's meaning and puts it into simpler terms by breaking it up into steps:

1. *Teach the comprehension strategies.*
   -The teacher defines predict, question, clarify, and summarize then models how to use them through a think aloud. Teacher instruction is supported by posters hung in the room about each strategy to be used as a reference.

2. *Introduce reciprocal teaching.*
   -The teacher states the purpose of reciprocal teaching, and precedes to model through a think aloud the above strategies; however, the teacher engages the students through shared reading. At the closure of this step, the teacher and students discuss how this activity improves their comprehension of text.

3. *Practice in teacher-led small groups.*
   -In guided reading groups, the teacher scaffolds students as they read and comprehend short sections of text using the four reading strategies. The students use post-it notes as they read and utilize the reading strategies for comprehending the text.

4. *Practice in student-led small groups.*
   -The students continue to participate in the same procedure listed under step 3; however, teachers are not scaffolding and students discuss within their group the strategies they used, and notes written and/or charts created.

5. *Continue to use reciprocal teaching with longer texts.*
   (Tompkins, 2006, p. 495)

These steps define the procedure of reciprocal teaching, an instructional method geared towards assisting students as they learn to use and apply reading strategies independently.

Why is Reciprocal Teaching Important?

A. Overall Significance

Reciprocal teaching is important since it "helps make children aware of [the reading] strategies [they automatically use as they read] in order to improve their understanding" (The Moray Council, n.d.). The students are given explicit instruction on reading strategies that help the students comprehend text. The instruction during reciprocal teaching includes not only the definition of the strategy, but also the significance of why that strategy is being taught. Next, the teacher models how to properly use that strategy in various texts. During modeling, the teacher uses a 'think aloud' to share with his/her class his/her thinking process or metacognitive thinking. These attributes of reciprocal teaching "allow the teacher and students to scaffold and

construct meaning in a social setting by using modeling, think-alouds, and discussion" to improve the usage of skills and reading comprehension (Oczkus, 2003, p. 1-2). In addition, the teacher places posters around the room defining the strategy and 'check lists' to embed the understanding of the strategy within their long-term memory (Palincsar and Klenk, 1991). These posters also served to build student confidence in using the strategies being learnt as they read (Hashey et al., 2003). Oczkus (2007) witnessed the confidence boost that reciprocal teaching gives struggling readers when she used it as an intervention within an inner-city school in Berkley, California. She stated, "We saw their attitudes change from reluctant and negative to more confident and assured" (p. 4).

B. Flexibility

Reciprocal teaching can also be used with any type of text narrative or expository. This is supported by Palincsar, Brown, and Purcell (1986) who define reciprocal teaching's purpose as reading to learn rather than learning to read. This aligns with Vygotsky's (1978) developmental theory that states " children first experience a particular set of cognitive activities in the presence of experts, and only gradually come to perform these functions themselves" (Palincsar and Brown, 1984, p.123). Other researchers and scholars (Oczkus, 2003) have also praised reciprocal teaching since "strategies are modeled and monitored in the context of actual reading" (Gunning, 2006, p.438).

Therefore, as teachers, we should be using various reading materials, both narrative and expository, as tools to help students develop comprehension through reading. This development occurs when students learn how to apply comprehension

strategies, such as visualizing, connecting, and summarizing to what they are reading. We must also teach them how to identify the deeper, less explicit information (inference) and meanings of texts and apply critical thinking (analyze, evaluate, and create) components to texts (McMillen, 1986). All in all, reading provides many opportunities for individuals to learn reading strategies that guide the level of comprehension they attain from each text. This is supported by Worthington (1979), who noted, "literature offers children more opportunities than any other area of the curriculum to consider ideas, values and ethical questions" (Carr, 1988, p.3)

C. Cooperative Learning

As the teacher moves into the position of observer and permits the students to take on the teacher-role within their small groups, the students discuss their metacognitive thinking while they practice the four reading strategies to comprehend the text. This component enables "students [to] assist each other in applying reading strategies" (Oczkus, 2003, p. 1). This is beneficial since teachers cannot always clearly instruct students in a way that it "makes sense" to them. Sometimes students can make better sense and understand an idea presented by the teacher when one of his/her peers explains the concept, using their grade and age appropriate level to clarify and condense the gaps for students that are confused (Kohn, 1999). Peer interaction is also valued by Vygotsky (1978) and Piaget (1926) on learning. Vygotsky (1978) states how meanings are formed initially within a group before retained independently by an individual. Similarly, Piaget (1926) states how the development of social-arbitrary knowledge can only be learned through interaction with others. The teacher walks from one group to the next, listening to each group's thinking process and level of mastery for the skill in the correct usage.

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D. The Impact on Student Learning

Lori D. Oczkus lists the objectives in Reciprocal teaching at work: strategies for improving reading comprehension as follow:

- Improve student's reading comprehension

- Scaffold the four strategies

- Guide students to become metacognitive and reflective

- Help students monitor their reading comprehension

- Use the social nature of learning to improve reading comprehension

- Strengthen instruction in a variety of classroom settings

- Be a part of the broader framework of comprehension strategies

(Oczkus, 2003)

Likewise, there are many other researchers and scholars that view reciprocal teaching positively for enhancing reading comprehension. Reading comprehension, as defined by RAND Reading Study Group, is "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language (Snow, 2002, p. xiii). This means reading comprehension is the result of the reader actively engaging with the text and using different reading strategies and reading with a purpose by taking information from the text and combining it with his/her own knowledge to make sense of the text. Similarly, Palincsar and Brown define reading comprehension as "the product of three main factors: (1) considerate texts, (2) the compatibility of the reader's knowledge and text content, and (3) the active strategies the reader employs to enhance understanding and retention, and to circumvent comprehension failures (Palincsar and Brown, p.118). Cathy Block, author of *Teaching Comprehension -The*

*Comprehension Process Approach,* wrote, "Reciprocal teaching models competent use of comprehension and metacognitive processes" (Block, 2004, p.92).

The National Reading Panel commends reciprocal teaching for improving students' reading comprehension (National Institute of Child Health and Human Development, 2000). Rosenshine and Meister (1994) concluded that reciprocal teaching improves reading comprehension, after reviewing 16 studies of reciprocal teaching (Oczkus, 2003, p.3). According to the National Assessment of Education Progress reading tests in 2003, "many young adolescents [struggled] with reading comprehension of academic tests-26% of American eighth-grade students performed at the below basic level" (National Center for Education Statistics, 2005; Cromley, 2007, p.1). Consequently, there is a great need for additional instructional options for teachers to use in teaching comprehension. Reciprocal teaching may be one effective approach to use for instruction in comprehension to alleviate this issue.

E. Research Findings

Palincsar and Brown (1986) discovered that reciprocal teaching increased the reading comprehension of the students from 30% to 80%; a 50% increase (Palincsar & Brown, 1986). Since this finding, many studies have addressed the effectiveness of reciprocal teaching across different settings, age groups, and populations (Hart & Speece, 1998; Le Fevre, Moor & Wilkinson, 2003; Lysynchuk, Pressley, & Vye, 1990; Palincsar, Brown, & Martin, 1987; Spörer, Brunstein, Kieschke, 2009). In 1977, Markman's study found how reciprocal teaching positively impacted all comprehension measures used in the study, especially summarization and question-generation skills. Similarly, Rosenshine and Meister (1994) found that the comprehension strategies of summarizing and self-

questioning most improved from the reciprocal teaching approach. The practice of reading comprehension skills through reciprocal teaching to increase reading comprehension remains effective even in the 21st century (Palincsar & Brown, 1984; Tompkins, 2006; Blakey & Spence, 1990). The study of 75 freshmen high-school students by Alfassi (1998) showed that students who learned through reciprocal teaching scored significantly better on their posttest (78.7%) in comparison to their pretest (64.6%) after 20 days of intervention for measuring passage comprehension (Alfassi, 1998). When Lubliner (2004) used this instructional activity as an intervention plan for three struggling 5th grade students, the use of reading skills and comprehension of social studies content improved. Before the intervention, John, David, and Janis scored between 30 to 40% from the teacher's resource book of reading comprehension assessment (Mueser & Mueser, 1997). In addition, their holistic reading assessment was below 40% from the fifth-grade basal series (Harcourt Brace, 1997). After these three struggling fifth-grade readers completed the reciprocal teaching intervention plan, they scored as follows on their posttest:  John 78%, David 76%, Janis 57% (Lubliner, 2004). Overall their use of reading skills and comprehension increased by 30 to 40% for John and David, and 10 to 20% for Janis. Janis was the lowest of the group, so her achievement was important as well.

<div align="center">What is Inference and Why is it Important?</div>

Inference is defined as "the ability to connect what is in the text with what is in the mind to create an educated guess" (Beers, 2003, p.61-62) and stretching "the limits of the literal text by folding our experience and belief into the literal meanings in the text, creating a new interpretation, an inference" (Keene and Zimmermann, 1997, p.147).

Inference is an important strategy to increase a student's reading comprehension of text because it is "the overall process of comprehension" (Anderson & Pearson, 1984, p.269), and the glue that cements the construction of meaning (Suh & Trabasso, 1993). The importance of inference is also supported by Caine and Oakhill (1999) and Keen and Zimmerman (1997) as a crucial strategy needed to comprehend text (Kopitski, 2007). Furthermore, researchers have stated that inferential comprehension is more difficult for children than literal comprehension (Hansen & Pearson, 1981; Guszak, 1967; Pearson, Hansen, & Gordon, 1979; Raphael, 1980).

Kopitski (2007), who explored the teaching of inference skills for her Masters of Arts degree in English as a Second Language noted that many of her students were low in interpretive/inferential comprehension. She defined this type of inference as, "based on students' ability to make reasonable predictions before, during and after reading, drawing inferences necessary for understanding, recognizing cause-effect relationships, and summarizing and synthesizing information from a variety of written material" (Kopitski, 2007, p.10). These are the ways that inference assists an individual's reading comprehension of text. This is why it is important to teach students how to properly use inference to become better, active readers.

How to Teach the Reading Strategy Inference

Many teachers agree that critical thinking, necessary in making inferences, is an important part of the learning process (Futrell, 1987; National Education Goals Panel, 1991; Drapeau, 2009); yet state how they lack the knowledge and confidence to properly teach these higher-level thinking skills. Samavedham (2006) suggested that providing

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students opportunities to engage in higher-level thinking could help them think more critically. As a result, the instructional activity, reciprocal teaching, is one method that would offer continuous exposure to reading comprehension skills.

How can Reciprocal Teaching be used to teach the strategy of inference?

A. Adaptability

Reciprocal teaching can be used to teach the strategy of inference by incorporating the inference strategy alongside the original predicting strategy for this procedure. Though there is limited research supporting this variation of reciprocal teaching, the research done by Doolittle, Hicks, Triplett, Nichols, and Young (2006) suggest that this variation would be plausible since they commended "the flexibility and transferability of the reciprocal teaching strategy" (p.109). They found reciprocal teaching to be effective when the Miami-Dade County Public Schools Project MERIT successfully added the strategy of visualizing to Palincsar and Brown's original four strategies; summarizing, predicting, clarifying, and questioning. (Doolittle, Hicks, Triplett, Nichols, and Young, 2006). This variation of reciprocal teaching implies that it is possible for reciprocal teaching to be effective, not only for strengthening a child's ability to summarize, predict, clarify, and question while reading, but also other reading strategies that a student utilizes as he/she visualizes or makes an inference.

B. Comparing Reading Strategies

Kopitski (2007) noted that many reading strategies share commonalities that overlap one another, such as the following: making connections, inferring, predicting, asking questions, summarizing, visualizing, using context clues, drawing conclusions,

and determining main ideas. She states that inferencing is a complex skill, included in many other types of reading strategies, such as asking questions, making connections, using context clues, predicting, and summarizing (Kopitski, 2007). This supports the notion of effectively implementing inference alongside prediction within the reciprocal teaching method format. Hicks (2006) conducted a case study labeled: *Facilitating Historical Inquiry in the Social Studies*, which incorporated inference in a modified version of reciprocal teaching to teach students how to analyze historical sources (Doolittle, Hicks, Triplett, Nichols, and Young 2006, p.110). The study (Doolittle et. al) supports the idea of using reciprocal teaching to teach inferencing in content areas.

Adding inference alongside the prediction strategy in reciprocal teaching should not be too dramatic or traumatizing since many readers confuse and use predicting and inferring interchangeably when they are not the same strategy. Research has illustrated how prediction is a part of inference (Kopitski, 2007). Prediction is when "a reader makes an educated guess about the course of events in a story or the kind of information that will be contained in a nonfiction piece; forces an activation of prior/[background] knowledge" (Gunning, 2006, p. 365). These predictions are confirmed or denied as the reader progresses through the text. At the conclusion of the text all predictions are completely verified or refuted. On the other hand, inference is when "a reader draws logical conclusions when limited facts are available, but clues or hints are presented" (Hall, 2002, as cited in Kasten, Kristo, & McClure, 2005, p.327). Prior or background knowledge may help a student as he/she uses the inference strategy; however, it does not explicitly state that it's needed in order to properly infer text to attain the reading comprehension of the story or passage. An inference is something that may or may not be

answered by the end of the reading. It's a logical and possible implicit cause created

through explicit evidence within the text, such as quotes, events, and details.

Furthermore, implementing inference into reciprocal teaching by pairing it with the

reading strategy prediction is supported by Keene and Zimmerman (1997) who state that

"readers who infer make predictions about the text, confirm or disconfirm those

predictions based on textual information, and text their developing comprehension of the

text as they read" (Keene and Zimmerman, 1997, p.23). This suggests that the reading

strategies inference and prediction, when paired, work reciprocally to strengthen a

reader's ability to use these strategies when comprehending what he/she read.

C. Teacher Questioning

When explicitly teaching students how to infer, Keene and Zimmerman (1997)

offer these questions to ask when developing a reader's ability to infer text.

**Infers**

[Select an event or fact that would call for a conclusion or interpretation. Refer to the

event or

fact when asking questions under number 2 below.]

1. [For narrative text] Can you predict what is about to happen? Why did you make that

prediction? Can you point to (or identify) something in the book that helped you to make

that prediction? [Or] What do you already know that helped you to make that prediction?

2. What did the author mean by _____? What in the story (text) helped you to know

that? What do you already know that helped you to decide that?

3. We have just discussed (talked about) predicting and inferring. [Restate child's response.]

What do you understand now that you didn't understand before?

(Keene and Zimmerman, 1997, p. 229)

This further shows the strong connections between the reading strategies inference and prediction.

D. Comparing the Components of Reciprocal Teaching with other Instructional Methods used to Teach Inference Skills

Reciprocal teaching is an appropriate method to use when teaching students inference skills, since the effective teaching strategies for teaching inference skills share commonalities with the reciprocal teaching method of other reading strategies. Dole et al. (1991) recommends "using explicit instruction to provide students with an explanation of what they will be learning, followed with guided practice, and opportunities for the students to use what they have learned on their own", as an effective teaching approach for teaching inference (as cited in Kopitski, 2007,p.21). The same guided practice is included within reciprocal teaching; "reciprocal teaching is an instructional approach that features "guided practice in applying simple, concrete strategies to the task of text comprehension" (Brown & Palincsar, 1989, p.413). In addition, the gradual release of the child to practice inference skills on their own during independent practice is similar to the reciprocal teaching process where children "first experience a particular set of cognitive activities in the presence of experts, and only gradually come to perform these functions

by themselves" (Brown & Palincsar, 1989, p.123). When teaching students how to use inference skills, the students receive explicit instruction by their teacher, then apply the inference strategy under the supervision of their teacher during 'guided practice', until they are finally released to try using the inference strategy on their own during 'independent practice' which could be an activity that they do in a small group or by him/herself.

Also, since capable readers rarely ever use one comprehension strategy at a time, the reciprocal teaching approach appears to be the most suitable to teach inference skills. As Kopitski (2007) explored teaching approaches to teach inference skills, she noted how inference should not be taught in isolation. In the Report of the National Reading Panel (2000) it stated how "it is most effective when a variety of reading strategies are learned together" (as cited in Kitpitski, 2007, p. 14). In addition, reading practitioners have agreed that teaching multiple reading strategies, all at once, increase reading comprehension (Harvey and Goudvis 2000, Tovani 2000, Beers 2003, and Armbruster 2003). The three other components of the original reciprocal teaching are strategies (questioning, summarizing, and clarifying) that could help support the reader as he/she infer the text for comprehension. Likewise, research has supported that reciprocal teaching should be applied to help students develop higher-level thinking skills. Omari and Weshah (2010) found that the studies they reviewed all agreed that higher order thinking skills are developed by the reading strategies used in reciprocal teaching (Hacker and Tenent, 2002). Additionally, other researchers have agreed that teachers need to apply this method [reciprocal teaching] in order to develop students' higher order

thinking skills (Plinscar & Brown, 1989; Carter, 1997; Greenway, 2002; Allen, 2003; Todd & Tracey, 2006 as cited in Omari & Weshah, 2010).

E. Defining Higher-order Thinking Skills

Higher-order thinking skills have also been referred to as critical thinking skills (Carr, 1988,p1). Bloom's Taxonomy is the most highly accepted triangular graph, in education, that lists the six, most important, intellectual levels within the cognitive domain. It is the graph that shows the higher-order/ critical thinking skills in order from lowest to highest. Kathryn S. Carr states "teaching students to think while reading-critical reading-should be central to any discussion of thinking skills. Critical reading has been defined as learning to evaluate, draw inferences and arrive at conclusions based on the evidence" (Zintz & Maggart, 1984; Carr, 1988, p.2) Therefore, inference is a higher-order thinking skill. Resnick (1897) after reviewing research "demonstrate[ed] that higher order thinking skills-"elaborate the given material, making inferences beyond what is explicitly presented, building adequate representations, analyzing and constructing relationships"- are involved in even the most apparently elementary mental activities (Lewis and Smith, 1993, p.133). Resnick goes on to state that, "in order for children to understand what they read, they need to make inferences and use information that goes beyond what is written in the text. Thus the teaching of reading involves an interweaving of basic and higher order thinking skills (Lewis and Smith, 1993, p.133). Therefore the questioning component of reciprocal teaching can be altered to direct the students to think more critically by requiring them to infer, draw conclusions, or evaluate (Gunning, 2006). Accordingly, "teaching students the strategies utilized in reciprocal teaching

develops [students'] higher order thinking (Hacker and Tenent, 2002; Omari & Weshah, 2010).

Conclusion

This literature review discusses ways that reciprocal teaching can be an effective teaching strategy in building academic skills, obtaining comprehension of text (Oczkus, 2003, 1-2), and monitoring the learning of students. In addition, it argues for teaching the students how to infer text through explicit direction, guided practice, and opportunities to utilize it on their own using authentic literature (Dole et al. 1991).

This literature review also suggests connections between the effective teaching strategies for inference skills (Dole et al. 1991) and reciprocal teaching (Brown & Palincsar, 1984). The commonalities are explicit instruction, guided practice, and independent practice in small groups which all are a part of the cooperative learning model. The available literature on graphic organizers and charts suggest that inference charts can be an effective tool during reciprocal teaching to construct inference skills (Block, 2004), attain comprehension for higher-level thinking questions (Hacker and Tenent) and evaluate the student's ability to infer text.

In chapter 3, a description of the research design and data sources utilized in this study are presented. In addition, the type of procedure used to analysis the data is also discussed. Lastly, a description of the study and participants is documented.

Chapter 3

Methodology

Introduction

This chapter examines the research design used in this study and the methods of data collection and data analysis. The final section concludes with a description of the context of the study and the participants.

Research Design

To evaluate the effectiveness of combining reciprocal teaching and inference, more information is needed than reading comprehension test scores. Consequently, the research paradigm selected is qualitative. Qualitative research is "an investigative process where the researcher gradually makes sense of a social phenomenon by contrasting, replicating, cataloguing and classifying the object of study" (Creswell, 2003, p. 161) by immersing oneself in the everyday events of the setting of the study. As the student teacher in this classroom, I will be completely immersed in and a part of the natural environment of this study. Qualitative research is also most appropriate for this study because it focuses on the development of fourth graders' use of various reading strategies, as well as, cooperative learning's impact on the students' overall reading comprehension of texts.

Teacher Research

The type of qualitative research used for this study is known as a teacher research which is specific to the education setting. Teacher research does not set out to solve large

scale problems but rather a specific problem identified by the classroom teacher. Cochran-Smith and Lytle (2009) explain teacher research as "teacher -led inquiries to examine their own assumptions, develop local knowledge by posing questions and gathering data…to work toward social justice by using inquiry to ensure social justice" (p.40). Hubbard and Power (1999) suggest that "teacher research is a natural extension of good teaching, observing students closely, analyzing their needs, and adjusting the curriculum to fit the needs of all students have always been important skills demonstrated by fine teachers" (p. 3). My study is teacher research because it takes place within the education setting and uses multiple methods of data collection such as teacher observations, student work (reading journals, teacher research journal, video tapes, photography), and questionnaires.

## Research Plan & Timeline

The research strategy used for this study is a case study using four, excel reading 4th grade students from a suburban area school district. These students go to the resource center to practice implementing various reading strategies to 5th grade level material books.  The rationale for pulling these students out during their independent reading time was to challenge them further at their instructional level, as well as, to better prepare them for 5th grade reading, by exposing them to the type of leveled reading material that they will be working with next year. Likewise, the decision to pull these students out was to assist them as excel students, in hopes that they will remain as excel students in reading next year.

The material used in this case study was the novel *The Sign of the Beaver,* reading journal notebooks, and a hand-out packet providing additional information and references about the content of reciprocal teaching and its reading strategies, papers defining inference and guidelines to use when inferring texts, and inference graphic organizing charts.

The time frame for this examination was four weeks, meeting every day for 20/25 minutes. The study was carried out by first getting to know the students and them getting to know me. On that same day, I also handed out the materials they would need for this investigation, as well as, introduced the concept of reciprocal teaching and the reading strategy inference. During that time, I guided them as they headed the pages of their reading journals for chapter 7 of the novel. We began with ch.7 for this study, since they read chapters 1-6 with the resource center teacher and independently within their class during reading time. The first few days following the introduction, the teacher modeled the meta-cognition that went into reading this book through the reciprocal teaching mode. Then the teacher engaged the students to help her comprehend the chapters through group discussions. Eventually, the teacher became the active observer as she released total responsibility into the hands of the students, as they took turns taking on the teacher-role in the whole group, student lead conversations about the chapters of The Sign of the Beaver. The teacher utilized both whole group and paired student lead discussion within the reciprocal teaching method. Throughout the whole process, April 4th-27th, the teacher reported her findings using a video camera for each group meeting, observations, teacher research journal, and reviewing the reading journals of each individual student. The teacher also took a few photographs while the students were engaged in whole group and

paired reciprocal teaching styles. At the final meeting with the students, May 6th, the teacher thanked the students for their participation and hard work. Then she handed out an open-question questionnaire for each of the four, 4th grade students to fill out. This concluded the data collection of the study.

Sources of Data

To begin with, teacher observations are an imperative portion of data in teacher research since observations assist the teacher as he/she critiques one's performance and practice of presenting lessons by adjusting the instructional component of the lessons, in order to meet the diverse learning styles of the individual students.

Secondly, student work is a vital piece of data in teacher research, since it shows what each individual student can do on their own, which portrays their strengths and weaknesses within the area being assessed in this study. This data is appropriate for this case study, since student work enables teachers to "understand what students know and are able to do, assess academic growth over time, [and] design instructional practices to reach all students" (Turning Points *Transforming Middle Schools,* 2001, p. 5).

Third, the teacher research journal is used to reflect on the lessons and the cooperative learning meetings. The teacher utilizes his/her own recollection of the group meeting, as well as, the student work to record competent and effective reflections in order to critique the case study to more efficiently answer the research question. The teacher research journal is fitting for this research examination, since reflections permit teachers to evaluate experiences and make revisions (Sherry Swain, 1998).

Fourth, video tapes are used as an important data collection method. As a participant in the study, the teacher researcher can miss vital information to document in her research journal, so video tapes allow the researcher to revisit the group meetings (Hubbard & Powers, 1999). The fifth source of data collection is photography. The use of pictures is fitting for this study, since it serves as a visual aid to the other data sources being analyzed. Photography is used as visual evidence for the characteristics of this study, as well as, permitting the readers to examine the students' facial expressions and activity to determine precision of the researcher's analysis of all the sources used in the data collection.

Lastly, questionnaires are the final component of the data collection for this teacher research. The open-ended questionnaire mode is a crucial element for this study, since it gives a personal insight about the opinions of the 4$^{th}$ grade subjects used in this case study. This is enriching since it will provide group and individual data on the effectiveness of reciprocal teaching to teach inference skills to improve overall reading comprehension.

Data Analysis

After collecting the data from these different sources, I critically reviewed each source to know what it was saying. My analysis focused on asking the following questions: What commonalities does the data show? Are these common actions or traits of a developmental stage the students exhibited? Were the students learning inferencing? What instructional components and activities aide students learning inference skills?

First I looked across all data sources and condensed and organized them into various categories. These categories were coded to help order the ideas. All sources of data were used to draw conclusions about students' learning of the higher-level thinking skill, inference. Reciprocal teaching, as a cooperative learning strategy, was also a focus of the study; both were studied to determine the impact on overall reading comprehension. The text used was a historical fiction novel, <u>The Sign of the Beaver</u>. The information gathered was helpful in drawing conclusions about the effectiveness of the instructional approach and cooperative learning for teaching inference skills.

## Context of Study

*District*

This study took place in Blackwood Elementary School in Gloucester Township School District, Camden County, NJ. According to the United States Census Bureau of 2010 the town's population was 42, 891. Gloucester Township School District consists of 11 schools: 8 elementary schools and 3 middle schools. Gloucester Township School District spends about $12,880 per pupil while spending 63% of their budget on instruction, 32% on support services, and 5% on other school expenditures (US Census Bureau, 2010).

*School*

Blackwood Elementary is culturally diverse. The Blackwood Elementary community consists of the following students: Caucasian, African, Hispanic, and Indian descent. Diversity is acknowledged and celebrated, as observed throughout the hallways and within the classrooms. Like other elementary schools in Gloucester County, this is a

title I school. Out of the total student population, 26% receive free and reduced lunch, based on family income.

*Classroom/Participants*

The participants in this case study are 4th grade, excel students. They were pulled out during their independent reading time to practice applying reading skills to 5th grade level material readings in the Resource Center. This 4th grade, excel reading group consists of 4 students: 2 boys and 2 girls. All students had parental permission to participate in this study.

## Looking Ahead

Chapter four will discuss the results of the study found by looking closely at individual data sources and then across all data sources. Chapter five will address the findings, limitations and implications of the study as well as suggest areas of further research.

Chapter 4

Data Analysis

Introduction

Chapter four analyzes and discusses the findings of the study to answer the key research question, "How will reciprocal teaching affect students learning to inference?" A look across all data sources seems to suggest three main themes that recur throughout the research. The three themes are: the role of read alouds in learning inferencing; significance of teacher questioning; and importance of schema.

Revisiting the Study

As stated in chapter three, I collected data during and after the study. Initially the 4th grade, excel reader case study was going to focus on student dialogue, responses, and interactions with the novel, The Sign of the Beaver; however, this alone was not feasible because of the high demands of the curriculum, preparing for the NJ ASK. As a result, I incorporated daily read alouds alongside reciprocal teaching and noted teacher observations of student engagement. In addition, I reviewed the student work in their reading journals where they shared their summaries and drawings during their reading discussions. Evaluating the reading journals gave insight into the students' individual ability to apply inference skills to the novel. While the students read aloud and conversed about each chapter, I recorded these meetings on my camcorder to review at a later time any interactions or dialogue. Also, I documented student dialogue and responses in my teacher research journal.

The Role of Read Alouds in Learning Inferencing

When analyzing the data collected during the group meetings, findings seemed to suggest a relationship between read alouds and students learning to inference. As the four students participated in the read aloud, students frequently interrupted the chapter reading to share inferences they made. This is illustrated by student responses to the excerpts below.

Chapter 6 excerpt: "The Indian had put something on the table as he came in. When he had gone, Matt hobbled over to see what it was and found a wooden bowl of stew, thick and      greasy, flavored with some strange plant, wonderfully filling and strengthening. With it there was a cake of corn bread, coarser than his own but delicious."

Mia: "I made an inference. The stew is a type of soup and it was Matt's dinner."

Jake: "It may be his lunch, since Matt said on the other page 'good morning'."

Mia: "I think it was his dinner since the next sentence after the meal says 'the next day'."

Jake: "Well the stew was his lunch or dinner, because stew isn't something you would eat for      breakfast."

Mia: "I agree. I never heard of someone eating stew for breakfast."

Chapter 7 portion: "How long Attean learn signs in book? It will take some time, Matt said. …One moon? One month? Of course not. It might take a year. With one swift jerk of his arm, Attean knocked the book from the table. Before Matt could speak, he was out of the cabin and gone."

Hope: "He'll be back."

Jake: "Yea, because his grandfather is going to force him to."

Mia: "These lessons are going to be dreadful. Attean is going to want to find a way out of learning to read."

Nick: "Yea, I think instead of learning to read, Attean is going to teach Matt how to survive on his own."

Jake: "I think that's a good idea. It would definitely get him out of reading. Besides Matt needs to learn how to hunt and get food since he has no gun and is short on food, since Ben ate it all."

Chapter 11 passage: "Matt couldn't make out why the Indian kept coming since he made it so plain he disliked the lessons. So often Attean made him feel uncomfortable and ridiculous. But he had to admit that on the days when Attean did not come the hours went by slowly. Often Attean seemed in no hurry to leave when the morning's lesson was over."

Hope: "Attean kept coming because maybe he promised his grandfather he would, even though he hated the lessons."

Jake: "Maybe Attean enjoys teaching Matt how to fish and hunt."

Mia: "I think that Attean is starting to like Matt and wants to be his friend. In chapter 10, Attean smiled at Matt for the first time when they ate the fish they caught."

Nick: "Yea and I think Matt wants to be Attean's friend because he is so lonely and bored when Attean isn't around."

These peer interactions suggest that students are able to make inferences on their own when given the opportunity to engage in dialogue during read alouds. Above, the reading discussions appear to correlate with the beliefs of Vygotsky's zone of proximal development and Piaget's theory that students acquire knowledge through social interactions.

Students also asked questions during the read alouds that required the group to infer the answers. As the students read aloud chapter 11, the readers are introduced to a new character in the novel, Attean's dog. The following exemplifies ways student questioning led to inference making.

Chapter 11 piece: "Sometimes Attean brought an old dog with him. It was about the sorriest-looking hound Matt had ever seen, with a coat of coarse brown hair, a mangy tail, and whitish patches on its face that gave it a clownish look. Its long pointed nose was misshapen with bumps and bristles. By the look of its ears, it had survived many battles."

Nick: "How did Attean get a dog?"

Jake: "Probably his family. Use the dog to help him hunt."

Chapter 7 passage: "A In Adam's fall/ We sinned all. That would hardly do. To be honest, he wasn't sure to this day just what it meant. He would feel mighty silly trying to explain it to a heathen."

Mia: "What does heathen mean?"

Jake: "Heathen means dumb, can't read, and not smart. It's a name to call Indians."

Nick: "It also means uneducated, but I don't think Attean is dumb. Just because he can't read doesn't mean he isn't smart. Indians do everything by hand and work with nature to survive, while white men have guns to hunt and stores to get food."

Hope: "With what Nick said, I infer that Matt is going to need Attean to survive."

Mia: "Looking at it that way, Matt will be the heathen, since he doesn't know how to survive out in the wild."

This same interaction was recorded for the initial pages of chapter 17. Chapter 17 described what Matt saw after waking up from the feast of the bear that he contributed to Attean killing. It also reveals why Attean stayed behind while his grandfather lead the hunt for deer and what Attean's grandmother thinks of Matt. This chapter disclosed the Indian's thoughts and feelings towards white men.

Mia: "Does Attean have a mother? Because we see him with his grandfather and the book talked about his grandfather and grandmother, but not about his parents."

Nick: "Maybe she's at the beaver house, but the author just hasn't talked about her yet."

Jake: "Maybe she's away like Matt's parents or dead because I think we would have seen them at the bear feast in chapter 16."

After the students completed the read aloud for chapter 17, they found out that Attean's mother was shot and killed by white men and that his father went out on a war trail to find the white man that killed his mother. Unfortunately, his father never returned home.

Students also naturally stopped reading to reveal an inference they made while reading aloud to the group. According to Calkins (2000), read alouds should be used to

demonstrate the thinking process while reading, but also engage readers. Here are

excerpts from the teacher research journal of students reading aloud and then pausing to

share their inference with the group:

Chapter 11excerpt: "Indian make sign," Attean said. "Always make sign to tell way. Matt

must same. Not get lost in forest." Matt had paid no mind. He saw now that Attean had

carefully been leaving markers. "Of course," he exclaimed. "But my father always made

blazes on the trees with his knife." Attean nodded. "That white man's way. Indian maybe

not want to show where he go. Not want hunters to find beaver house." So these were

secret signs. Nothing anyone following them would notice. It would take sharp eyes to

find them, even if you knew they were there."

Nick: "I have an inference. Attean trusts Matt because he shows Matt the signs on the

trees to head to the beaver house."

Chapter 13 passage: "Even though Attean annoyed him, Matt was constantly goaded to

keep trying to win this strange boy's respect."

Mia: "Uh, I have an inference. I think Matt is trying to win Attean's respect to show him

not all white people are bad."

Jake: "I agree. Matt is getting angry that Attean is always trying to show him that Indians

are better than white people."

Chapter 15 piece: "He was walking behind Attean, swinging the rabbit carelessly by the

ears as Attean always did, when the Indian suddenly halted, his whole body tensed. Matt

could see nothing unusual, and he had opened his mouth to speak, when Attean silenced him with a jerk of his hand."

Hope: "I...I think I have an inference. Attean's body tensed and he silenced Matt because there was danger."

Nick: "The danger was probably some white men or dangerous animal like a pack of wolves, wild cat, or a bear."

The discussions that evolved naturally during the read alouds imply that inference making was easier for the students while engaged with the novel in a whole group, than reading and reflecting on the chapters independently. Whether students shared their inference as they read, interrupted another student reading, or inferred answers to the questions posed, these student led reading discussions suggest that read alouds and reading discussions, together, assist students learning inference skills.

<center>Significance of Teacher Questioning</center>

Through analysis of my teacher research journal, reviewing the reading journals of the individual students, and observations of their reading discussions about the predictions and inferences they made, I found that the students infrequently talked about or wrote predictions with an inference in their reading journals. These sources of data suggested that the students did not feel confident predicting and inferring text, as well as, possibly found the task confusing and/or too challenging. Nevertheless, it showed that the students' ability to make inferences on their own or without teacher supervision was poor. Therefore, I decided to intervene during the reading discussions to ask what they predicted and inferred in the chapters. In addition, I listened attentively to the types of

predictions and inferences they were making to know when they needed teacher

prompting to create deeper meaning inferences. When the students made inferences, they

appeared to be more surface inferences, more superficial. For example, in the reading

journals and during the read alouds, I found students write and/or verbalize the following:

"I predict that Attean will teach Matt Attean's way of fishing. Infer- I predicted that

because I read that chapter and Attean told him how" (write); "I predict that Matt will

join the Beaver Tribe. Infer-I read this on the back of the book" (write); "I predict that

Matt and Attean will share stories. I infer this because I read the chapter" (oral); "I

predict that Matt and Attean will go on a hunt. I infer this because I read the chapter and

they did" (oral).

As I intervened and asked questions about how they inferred their predictions

using textual evidence within the chapter, as well as, presenting my own inference

questions for the students to collaboratively answer, findings revealed a connection

between teacher questioning and students learning to inference. Elder and Paul (1998)

believe that "students need questions to turn on their intellectual engines." *The Role of

Socratic Questioning in Thinking, Teaching, and Learning* suggests that "Socratic

questioning is important for the critical thinker because the art of questioning is important

for excellence of thought. The word *Socratic* adds "systematicity," depth, and a keen

interest in addressing the truth or plausibility of things."

The following are examples of student predictions with inferences directed by

further teacher questioning to guide the students to make more meaningful inferences.

Also there are examples of teacher inference questions that were asked for the group to

collaboratively answer using textual support from the chapters. These examples were

obtained by observations, teacher research journal, and video clips of student dialogue. The data is listed by chapters, not by the source in which they were attained. Furthermore, the data for each chapter is labeled as student prediction and inference (sp&i) or teacher inference question (tiq). Lastly, each chapter is labeled by the source where it was retrieved; observation (o), teacher research journal (trj), or video (v).

Chapter 10 (sp&i)/ (trj)

After completing the read aloud for chapter 10, the students predicted and inferred that Matt and Attean would form a friendship. As shown, their prediction is presented but not their inference. I proceeded to ask, "What textual supports, from chapter 10, lead you to infer that they will form a friendship?"

Hope: "Because Attean taught Matt how to fish with a spear."

Mia: "Matt and Attean are always doing something together in each chapter."

Nick: "They worked together to cook the fish."

Jake: "Attean is forced to go see Matt to learn how to read. Since he has to but doesn't want to learn to read, they find fun things to do which is making them be friends."

Chapter 11(sp&i)/ (v)

During the reading discussion for chapter 11, Nick and Jake shared their 'predict and infer' page for chapter 11 from their reading journals. Jake wrote, "I predict his family will not come back." Similarly, Nick wrote, "I predict Matt's father will not come back." I praised them for coming up with a prediction, and then requested the group to find evidence from the chapter that was used to infer this prediction.

Nick: "The back of the book says (reads back of book) '"many months pass with no sign of Matt's family,"' so they aren't coming back."

Jake: "The seven notches are in the seven sticks and they aren't back."

Chapter 12 (tiq)/ (trj)

Near the end of our reading session for chapter 12, I posed an inference question, since the students did not make any inference during the read aloud. I reverted their attention to the last sentence of the chapter, "Soon, he promised himself, the squirrels would have more respect than to frisk about so boldly over his head." The question presented was, "What do you think Matt is going to do once he knows how to properly use the bow and arrow?"

Mia: "Shoot one of the squirrels so they won't play around and eat his food."

Another teacher question for this topic, "How do you think Attean will do if Matt does this?"

Nick: "Attean will be mad."

Jake: "Attean will say, '"No shoot animal for fun, only for food."'"

Chapter 13(tiq)/ (v)

Another illustration of a teacher inference question addressed to the 4th grade, excel readers for this case study was, "Do you think the Turtle Clan are bad Indians?"

Hope: "Yes, because they have iron traps."

Mia: (adding onto Hope's response) "Not the Indian way to trap animals."

The next question asked by the teacher, "Who do you think is the 'white men' paying the Indians to hunt for them?"

Nick: "Ben because he can't use the gun he stole from Matt, because he has no more gun powder."

Jake: "He might be living with the Turtle clan since he told Matt he may live with Indians for awhile and trade furs."

Chapter 15(tiq)/ (o)

When constructing a question that required the students to infer a character's emotion, the responses were as followed for "How did Matt feel when Attean told him that he moved quick like an Indian?"

Hope: "Happy."

Mia: "Embarrassed."

Teacher questioning continued, "What evidence from the chapter made you infer this?"

Jake: "He was embarrassed because his cheeks turned red."

Mia: "His cheeks turned red because he got embarrassed from Attean's compliment."

Nick: "He was happy because your cheeks turn red when you are blushing."

Chapter 17(sp&i)/ (o)

The student predictions depicted here were done during paired read aloud and reciprocal teaching method. The teacher role was held by the girls, since they completed the assignments for chapter 17 in their reading journals, while the boys were the "students". Both pairs predicted that Matt would join the Beaver tribe, yet had no inference to support their prediction. Therefore, I met with each pair and again asked, "What evidence from the chapters, read so far, made you infer this?"

Pair Hope and Nick:

Nick: "All seven sticks have seven notches and his family isn't back."

Hope: "Attean and Matt do a lot of things together like fishing, hunting, and Matt is learning the ways of the Indians."

Pair Mia and Jake:

Mia: "It's been months and Matt's family isn't back yet."

Jake: "Attean invited Matt to the bear feast and is teaching him the Indian's way of life."

Mia: "Yea, like fishing and trapping animals."

The teacher questioning suggests that students are able to make inferences with greater success than when asked to make a prediction and support that prediction with an inference they made using context clues and schema. As shown, students naturally made predictions, yet left out the inference. However, when students were presented with inferential questions, it appears that they were able to utilize the inference strategy more sufficiently to create thought provoking inferences.

Importance of Schema

Looking closely at four, 4<sup>th</sup> grade excel readers, there was one student who was able to make accurate inferences for many of the inferential questions that I posed throughout this case study. Nick's natural ability to make inferences for the novel, <u>The Sign of the Beaver</u>, were observed by the teacher, documented within the teacher research journal, and recorded in the video clips throughout the case study. The findings obtained from theses sources propose that schema plays a major role in a student's ability to make inferences. <u>Learning to read in American schools: basal readers and content texts</u> deem one of the six functions of schema is to "enable inferential elaboration." Anderson (1978) believes "a reader's schema provides the basis for making inferences that go beyond the information literally stated in a text." Here are the inferential questions, followed by Nick's responses that support the idea that the greater the schema the better the inference made.

Chapter 6-Teacher inference question: "Why does Saknis want Attean to learn 'white man's signs'?" What would Attean be able to do once he learns to read 'white man's signs'?"

Nick: Saknis wants Attean to learn how to read, so he can read the treaties the white men give the Indians. Long ago, the white men kept trying to move the Indians off their lands and into reservations."

Teacher: "Why is it important for Attean to know how to read the treaties?"

Nick: "So the Indians know what they are agreeing to when asked to sign the treaties."

Chapter 8-Teacher inference question: "Why did Attean prefer to listen to Matt read Robinson Crusoe than learn the letters of the alphabet and how to read the white men signs?"

Nick: "Because Indians learned through storytelling. That's how information was passed on in Indian history."

Teacher: "How do you know this?"

Nick: "I watch the history channel with my parents and saw some shows about Indians."

Chapter 10-inference question: "Why do you think Attean talked to the fish, while he was fishing?"

Nick: "Attean talks to the fish because he thinks they can understand him."

Teacher: "Do you think they understand him?"

Nick: "I don't know, but it worked. In Pocahontas, the animals and nature understood Pocahontas and the other Indians. Maybe Attean believes animals have souls like us and can understand us if we talk to them in their language."

Chapter 11-inference question: "Why did the dog's hair go straight up on its back and let out a mean growl when it saw Matt?"

Nick: "Because Matt was not an Indian and it's use to Indians. He was trying to protect his owner since Matt was a white boy. There were wars between the Indians and white men in the past."

Teacher: "How do you know about wars between the Indians and white men?"

Nick: "Movies."

Teacher: "What types of movies?"

Nick: "BrainPop."

Chapter 17-Teacher inference question: "Why didn't Attean's grandmother want Matt at the feast or sleeping in her house?"

Nick: "She doesn't trust Matt because he is a white boy. She hasn't had good experiences with white people in the past. She remembers the wars between the Indians and white men."

While I presumed that teacher scaffolding and student practice alone would help children learn inference skills, the inferential questions, inquired by the teacher, suggest that a learner's schema also plays a pivotal role in assisting a child as he/she develops inferential skills. It proposes that when a child's schema is familiar with the genre or topic being discussed, they will make more profound inferences than if they had little to no schema, producing more surface inferences.

## Summary of Data Analysis

As discussed previously, learning inference skills, in large part, occurs when a student is explicitly instructed through think alouds and scaffolding, followed by guided practice and opportunities to use the acquired inference skills during independent reading times (Dole et al, 1991). In addition, reading discussions are believed to positively contribute towards students' usage of reading strategies and reading comprehension by interacting with texts among their fellow peers (Vygotsky, 1978). Prior to conducting my

research, I believed these were the most pivotal components in teaching students inference skills. Though I was not incorrect, now I am able to understand further that students obtain inference skills beyond just teacher instruction, reading discussions, and through guided and independent practice. Reading discussions are not fruitful if the students are unable to read the chapters and complete the reading journal assignments. Incomplete reading journal entries for chapters and lack of confidence and understanding of inference skills produce lack of conversations about inferences made while reading. Students having little to no background knowledge in the genre or topic discussed results in the child's inability to make profound inferences. Therefore, other factors contribute to students learning inference skills. These components are read alouds, teacher questioning, and learner's schema.

After conducting the study I learned students developed inference skills through read alouds and teacher questioning to promote discussions about the readings which included making inferences. In addition, I noticed that the learner's schema played a major role in making thoughtful inferences during the read alouds as well as for answering questions inquired by the teacher. Giving the students the opportunity to read the chapters aloud and engage in student led reading discussions promoted natural pauses during the read alouds to pose questions and make inferences. When examining the inferences made by the students on their own, in their reading journals, in comparison to students sharing inferences made during the read alouds, there was a noticeable difference. For chapters 6-17, there was little to no evidence of inference making or attempts made by the students separately; this was documented within their individual reading journals. In contrast, when the students were brought together to read aloud and

participate in reading discussions for chapters 6-17, there were at least one or two inferences made per chapter. These inferences came naturally through student dialogue by way of questions that required inferential answers, determining the meaning of unfamiliar words by using their schema and context clues, and/or students sharing what they believed to be inferences that they made during the read aloud. Concurrently, the teacher intervened during these reading discussions to guide students as they made apparent inferences to become more profound inferences through teacher questioning. As the students noticed a common pattern reoccurring throughout the novel, they began to infer the activities that the main characters would do in the next chapter; a type of surface inference. Through teacher questioning, the teacher challenged them to find the deeper meaning to the reoccurring adventures; an example of a thoughtful inference. This teaching strategy increased both the students' ability to make deeper inferences, and produce inferential responses. Additionally, dialogue between students and teacher, once the teacher presented an inferential question, generated an obvious improvement in the students' ability to construct inferential answers. This suggests that the students are in the initial developmental stage of learning inference skills. Student dialogue indicates they understand how to utilize inference skills to answer inferential questions, but are not comfortable and/or know how to use inference skills to create inferences on their own. Although it is evident that students performed better when answering inferential questions in comparison to creating inferences on their own, much teacher guidance was needed to foster the learning of the inference skills. Though the reading discussions suggested students were able to construct sufficient inferential answers, the responses varied according to the learners' schema. The relationship between a student's schema

and learning inference skills was discovered through inferential questions created by the teacher. While my data suggests a slight increase in student learning inference skills through the reciprocal teaching model, a student's ability to inference is not something easily measured through assessments and discussions alone in this time frame, but rather through observations of participation during read alouds and reading discussions. Students wanted to read and participate in the read alouds and reciprocal teaching, share with others, and unveil their learning of inference skills with the assistance of teacher questioning and peer interactions. Their conversations do indeed suggest that learning inference skills improved during the case study in this particular group.

Chapter 5

Summary, Conclusions, Limitations, and Implications

Restatement of Findings

After reviewing and interpretation of the data sources, three overriding themes emerged: the role of read alouds in learning inferencing; significance of teacher questioning; and importance of schema.

First, read alouds encouraged natural interactions and discussions regarding the novel. Students engaged in making inferences as they conversed during the read alouds more than when they read independently and attempted to make inferences on their own. Secondly, working in small groups to collaboratively respond to teacher questioning seemed to generate better inferences from predictions. And finally, students' schema contributed to the type of inferences made during the read alouds and discussions. Student schema also contributed to the type of inferences made during the read alouds and discussions. The greater the schema on the topic being conversed, the more profound the inference appeared to be. The study suggested that read alouds, dialogue, teacher questioning, and schema work together to in reciprocal teaching to promote the development of inference skills.

Conclusions

Based on my findings and the research of others in the field, I learned a great deal about the role that instruction can play in promoting inference skills. Read alouds and reciprocal teaching, accompanied by teacher questioning should be considered when choosing an instructional method to provide means to guide young readers as they apply inference skills to texts.

Most of the research supported the idea of teaching inferencing using the reciprocal teaching model. While I could not implement my study for the novel reading to its entirety, I noticed that proper use of inference skills increased slightly in only a few weeks. Students wanted to read and participate in meaningful discussions with the assistance of teacher modeling and questioning (Dole et al., 1991, Keene, 1997). Utilizing read alouds and reading discussions together played a large role in the outcome of the students' development of inference skills. When students can come together to assist one another as they read aloud and share opinions along with inquiries, they have an increased sense of purpose thus fostering the development of learning inference skills through cooperative learning (Vygotsky, 1978). Time spent on modeling how to inference and what engaged readers do by the teacher, serves as a starting point for the students to develop an understanding and significance of inferencing in reading (Kopitski, 2007). Taking the time to critique student inferences and promoting inferences through teacher questioning, encourages students to utilize inference skills while they read and make more profound inferences (Elder and Paul, 1998). Anderson (1978) found that a learner's schema assists him/her in one's growth and application of inference skills while reading. The development of inference skills appears to be driven by explicit instruction and when students are given the opportunity to engage in reading discussions within cooperative learning groups during guided reading sessions.

These themes and relationships emerged from the findings of my study and support the current research that suggests read alouds, conversations, teacher questioning, and reader's schema promotes inference learning within small group settings in the classroom.

Limitations

This study was conducted in my Clinical Internship placement; therefore, the time allotted for our meetings was not in my control. I had only 40/45 minutes in the afternoon to meet with two different 4th grade reading groups, consequently, it was challenging to complete the read aloud and conversation about each chapter within 20 minutes, since the chapters varied in length. The explicit instruction and scaffolding were condensed within two days, due to the time restraint to complete the study in four weeks. Likewise, the implementation of the study was during the end of the school year, April-May, when the study was constantly interrupted by vacation days for spring and Easter break, along with preparation for the NJ ASK test. Also, the completion of the reading journals for each chapter seemed to be a great challenge for the students to accomplish. The feelings toward this work was eager yet hesitant due to the workload already expected of them to get ready for the NJ ASK, as well as, the likelihood that this additional work would interfere with their extracurricular activities after school; sports (baseball) and enjoying the summer weather. Because the students were bombarded with assignments to prepare for the NJ ASK, and were beginning to get into the end-of-the-year/summer mode, the results may have been skewed.

Implications of the Study for Future Research

After reviewing the findings from my data sources, I realized there are a few more areas of inference development that could be researched to determine the effectiveness within a guided reading group. Concerning students making inferences on their own, I wonder how beginning each meeting with a different mini-lesson on inferencing, such as

emotion, setting, or character traits would have impacted the students' level of independence in making inferences on their own during the reading discussions. I wonder if student independence would have been achieved if students were given certain inference tasks for each chapter reading at the beginning, then released to make any inferences learnt for the chapters at the end of the study in student led reciprocal teaching in whole group and pair settings.

Secondly, I would be interested to see results periodically throughout the school year. By completing the study in just four weeks, students were introduced to an entirely new way of teaching reading skills, but that only lasted the duration of the study. I would be eager to see if the results varied dramatically over the course of the school year. This further investigation would assist teachers in formulating a reading strategies teaching plan for the school year in order to develop more critical thinking readers from September to June.

Thirdly, I would be curious to see results providing more insight on the role a learner's schema plays in the development of inference skills. During the study, I noticed one child who had great schema in history and information about Indians and white settlers. I would be excited to see if the results fluctuate considerably in regards to a child's schema used to infer text during the entire school year's guided reading meetings of different books, genre and topics. This would provide greater awareness of the importance that schema plays in active, critical thinking readers. In addition, this would assist teachers as they decide on the instructional method and material to use when teaching higher-level thinking skills.

Lastly, a few other things to consider with further research would be the impact of utilizing reciprocal teaching and read alouds for struggling 4th grade readers and in younger grade levels. With participants that were 4th grade excel readers inference development was easily attainable, since these students are already active readers. This case study was to assist these engaged readers to think more critically and be exposed to 5th grade material reading. The graphic organizers that were optional for the students used in this case study would most likely be mandatory for struggling 4th grade readers and students in younger grade levels. Adjustments would need to be made in the instructional component and reading journal assignments to meet the needs and developmental stage of the individual students. It is important that all students are participating during the read alouds because that paired with reciprocal teaching is essential in promoting the development of inference skills.

References

Alfassi, M. (1998). Reading for meaning: the efficacy of reciprocal teaching in fostering reading comprehension in high school students in remedial reading classes. *American Educational Research Journal*, 35(2), 309-332 Retrieved December 10, 2010, from the JStor database.

Allen, S. (2003). An analytic comparison of three models of reading strategy instruction. *International Review of Applied Linguistics in Language*, 41(4), 319-339.

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives* (Complete ed.). New York: Longman.

Anderson, R. C., Osborn, J., & Tierney, R. J. (1984). *Learning to read in American schools: basal readers and content texts*. Hillsdale, N.J.: L. Erlbaum Associates.

Anderson, N.A., & Pearson, P.D (1984). A schema-theoretic view of basic processes in reading comprehension. In P.D Pearson (Ed.), *Handbook of reading research*, 255-291. New York: Longman.

Anderson, N.A., & Richards, J. C. (2003). How Do You Know? A Strategy to Help Emergent Readers Make Inferences. *Reading Teacher*, 57(3), 290-293. Retrieved December 10, 2010, from the ERIC database.

Armbruster, B.B., Lehr, F., Osborn, J. (2003). *Put reading first: The research building blocks of reading instruction, kindergarten-grade 3.* (2nd ed.). National Institute for Literacy.

Beers, K. (2003). *When kids can't read:* What teachers can do, Portsmouth, NH: Heinemann.

Blakey, E., & Spance, S. (1990). Developing metacognition. ERIC Digest, 1-5. Retrieved
    December 10, 2010, from the ERIC database.


Block, C. C. (2004). Crafting Accurate Literal Understandings. *Teaching comprehension:
    the comprehension process approach* (pp. 91-92). Boston: Pearson/A and B.


Block, C. C. (2004). Developing Inferential, Predictive, and Interpretive
    Comprehension. *Teaching comprehension: the comprehension process approach*
    (p. 106). Boston: Pearson/A and B.


Brown, A. L., Palincsar, A. S., & Purcell, L. (1986). Poor readers: Teach, don't label. The
    school  achievement of minority children: New perspectives (pp. 105-143).
    Hillsdale, NJ:  Lawrence Eribaum Associates, Publishers.


Brown, A. L., & Palincsar, A. S. (1989). Guided, cooperative learning and individual
    knowledge acquisition. In L. B. Resnick (Ed.), *Knowing, learning, and
    instruction: Essays in honor   of Robert Glaser* (pp. 393-451). Hillsdale, NJ:
    Erlbaum.


Buskist, W. (2004). APS Observer - Ways of the Master Teacher. *Association for
    Psychological  Science*. Retrieved May 28, 2011, from
    http://www.psychologicalscience.org/observer/getArticle.cfm?id=1637


Cain, K., & Oakhill, J.V. (1999). Inference making ability and its relation to
    comprehension failure in young children. *Reading and Writing: An
    Interdisciplinary Journal,* 11. 489503.


Calkins, L. (2000). Let the Words Work Their Magic. *Instructor*, 110(3), 25.


Carr, K. S. (1988, Winter). How can we teach critical thinking? *Childhood Education,
    65*(2), 69–73.

Carter, C.J. (1997). "Why Reciprocal Teaching?" *Educational Leadership,* Vol. 54(6), p. 64-68.

Center for Collaborative Education. (2001). Turning Points - Transforming Middle Schools. *Turning Points - Transforming Middle Schools*. Retrieved May 28, 2011, from http://www.turningpts.org

Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education* (Six ed.). Abingdon: Routledge.

Cooper, J.D., Boschken, I., McWilliams, J., & Pistochini, L. (2000). "A Study of the Effectiveness of an Intervention Program Designed to Accelerate Reading for Struggling Readers in the Upper Grades," In T. Shananhan & F.V. Rodriguez-Brown (Eds.), *49$^{th}$ Yearbook of the National Reading Conference* (pp. 477-486). Chicago: National Reading Conference.

Cromley, J., & Azevedo, R. (2007). Testing and Refining the Direct and Inferential Mediation Model of Reading Comprehension. *Journal of Educational Psychology*, *99*(2), 311-325. Retrieved December 10, 2010, from http://azevedolab.autotutor.org/files/publications/Cromley%20%26%20Azevedo%20%282007%29%20JEP.pdf

Dole, J. A., Duffy, G.G., Roehler, L.R., & Pearson, P.D. (1991). Moving from the old to the new: Research on reading comprehension instruction. *Review of Educational Research,* 61(2), 23964.

Doolittle, P., Hicks, D., Triplett, C., Nicholas, W., & Young, C. (2006). Reciprocal Teaching for   Reading Comprehension in Higher Education: A Strategy for Fostering the Deeper Understanding of Texts. *International Journal of Teaching and Learning in Higher Education*,   *17*(2), 106-+118. Retrieved June 1, 2011, from www.isetl.org/ijtlhe/pdf/IJTLHE1.pdf

Drapeau, P. (2009). "Infer": Drawing Conclusions. *Differentiating with graphic organizers: tools to foster critical and creative thinking* (pp. 51-63). Thousand Oaks, Calif.: Corwin Press.

Educational Psychology Service - Reciprocal Teaching and Book Detectives. (n.d.). *The Moray Council*. Retrieved December 10, 2010, from http://www.moray.gov.uk/moray

Elder, L., & Paul, R. (1998). The Role of Socratic Questioning in Thinking, Teaching, and Learning. *The Clearing House*, *71*(5), 297-298. Retrieved June 15, 2011, from the JStor database.

Fielding, L. G., Anderson, R. C., & Pearson, P. D. (1990). *How discussion questions influence children's story understanding* (Tech. Rep. No. 490)*. Urbana, IL: University of Illinois, Center for the Study of Reading.

Gallagher, C. (1999). Lev Semyonovich Vygotsky. *Muskingum College: Department of Psychology*. Retrieved May 28, 2011, from www.muskingum.edu/~psych/psycweb

Greenway, C. (2002). The process, pitfalls and benefits of implementing a reciprocal teaching intervention to improve reading comprehension of a group of year 6 pupils. *Educational Psychology in Practice*, 18(2), 113-138.

Gunning, T. G. (2006). Reading to Learn and Remember in the Content Areas. *Assessing and correcting reading and writing difficulties* (3rd ed., p. 365, 438). Boston: Pearson/Allyn and Bacon.

Guszak, F.J. (1972). *Diagnostic reading instruction in the elementary school*. New York: Harper & Row.

Hacker, D & Tenent, A. (2002). Implementing reciprocal teaching in the classroom: overcoming obstacles and making modifications. *Journal of Educational Psychology, 94 (4),* 699 –718.

Hansen, J. (1981). The Effects of Inference Training and Practice on Young Children's Reading Comprehension. *Reading Research Quarterly*, 16(3), 391-417. Retrieved December 10, 2010, from the Jstor database.

Hansen, J., & Pearson, P.D (1983). An instructional study: Improving the inferential comprehension of fourth grade good and poor readers. *Journal of Education Psychology*, 75(6), 821-829. Retrieved December 10, 2010, from the ERIC database.

Harcourt Brace. (1997). *Signatures. Teacher's materials assessment choices*. Orlando, FL: Author.

Hart, E. & Speece, D. (1998). Reciprocal teaching goes to college: Effects for postsecondary students at risk for academic failure. *Journal of Educational Psychology*, 90(4), 670-681.

Harvey, S., & Goudvis, A. (2000). *Strategies that work: Teaching comprehension to enhance understanding*. Portland, ME: Stenhouse Publishers.

Hashey, J., & Connors, D. (2003). Learn from our journey: Reciprocal teaching action research. *The Reading Teacher*, *57*(3), 224-232. Retrieved May 28, 2011, from the JStor database.

Hubbard, R., & Power, B. M. (1999). *Living the questions: a guide for teacher-researchers*. York, Me.: Stenhouse Publishers.

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Kasten, W. C., Kristo, J. V., McClure, A. A., & Garthwait, A. (2005). *Living literature: using children's literature to support reading and language arts*. Upper Saddle River, N.J.: Pearson/Merrill/Prentice Hall.

Keene, E. O., & Zimmermann, S. (1997). *Mosaic of thought: teaching comprehension in a reader's workshop*. Portsmouth, NH: Heinemann.

Kelley, M., & Grace, N. (2007). The Metacognitive Teaching Framework in Your Classroom. *Comprehension shouldn't be silent: from strategy instruction to student independence* (p.3). Newark, DE: International Reading Association.

Kispal, A. (2008). *Effective teaching of inference skills for reading: literature review*. Nottingham: Department for Children, Schools and Families.

Koebler, J. (2011, May 25). U.S. Can Learn From Other Countries' Education Systems - High School Notes (usnews.com). *US News & World Report | News & Rankings | Best Colleges, Best Hospitals, and more*. Retrieved June 1, 2011, from http://www.usnews.com/education/blogs/high-school-notes/2011/05/25/us-can-learn-   from-other-countries-education-systems

Kohn, K. (1999). Molecular interaction map of the mammalian cell cycle control and DNA repair systems. *Mol. Biol. Cell*, 10, 2703-2734.

Kopitski, M. (2007). *Exploring the teaching of inference skills* (Unpublished master's thesis). Hamline University, Saint Paul, Minnesota.

Kucan, L., & Beck, I. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. *Review of Educational Research*, 67, 271-299.

Lauer, T. (2005). Teaching critical-thinking skills using course content material. *Journal of College Science Teaching*, *34*(6), 34-44.

Le Fevre, D. M., Moore, D. W., & Wilkinson, I. A. G, (2003). Tape-assisted reciprocal teaching: Cognitive bootstrapping for poor decoders. British Journal of Educational Psychology, 73(1), 37-59.

Lederer, J. (2000). Reciprocal teaching of social studies in inclusive elementary classrooms. *Journal of Learning Disabilities*, 33(1), 91-107. Retrieved December 10, 2010, from the EBSCOhost database.

Lewis, A., & Smith, D. (1993). Defining Higher Order Thinking. *Theory Into Practice*, *32*(3), 131-137. Retrieved December 10, 2010, from the JStor database.

Lubliner, S. (2004). Help for Struggling Upper-Grade Elementary Readers. *The Reading Teacher*, *57*(5), p430-438, 9p. Retrieved November 24, 2010, from the ERIC-EBSCO database.

Lysynchuk, L. M., Pressley, M., & Vye, N. J. (1990). Reciprocal teaching improves standardized reading-comprehension performance in poor comprehenders. *The Elementary School Journal,* 90(5), 469-84.

Mantione, R., & Smead, S. (2003). Weaving through words: Using the arts to teach reading comprehension strategies. *Newark, DE: International Reading Association.*

Markman, E. M. (1977). Realizing that you don't understand: A preliminary investigation. *Child Development*, 48, 986-992.

McGee, A. and Johnson, H. (2003). The effect of inference training on skilled and less skilled comprehenders. *Educational Psychology*, 23(1), 49-59.

McMillen, L. "Many Professors Now Start at the Beginning by Teaching Their Students How to Think." Chronicle of Higher Education (March 5, 1986): 23-25.

Miles, M. B., & Huberman, A. M. (1984). *Qualitative data analysis: a sourcebook of new methods*. Beverly Hills: Sage Publications.

Muesear, A., & Mueser, J. (1997). *Reading*. New York: McGraw-Hill.

National Center for Education Statistics. (2005). *The nation's report card.*

Retrieved August 18, 2005, from http://nces.ed.gov/nationsreportcard/ reading/results2003/natachieve-g8.asp on

National Institute of Child Health and Human Development. (2000).*Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. Reports of the subgroups* (NIH Publication No. 00-4754). Washington, DC: U.S. Government Printing Office. Retrieved June 1, 2011, from http://www.nichd.nih.gov/publications/nrp/report.htm

National Reading Panel. (2000). *Teaching children to read: An evidence based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC: National Institute for Child Health and Human Development.

Nokes, J. (2008). The Observation Inference Chart: Improving Students' Abilities to make Inferences while Reading nontraditional. *Journal of Adolescent & Adult Literacy*, *51*(7), 539. Retrieved November 24, 2010, from the JStor database.

Oczkus, L. D. (2003). Introduction. *Reciprocal teaching at work: strategies for improving reading comprehension* (pp. 1-2). Newark, DE: International Reading Association.

Omari, H.A., & Weshah, H.A. (2010). Using the Reciprocal Teaching Method by Teachers at Jordanian Schools. European Journals of Social Science, 15, 26-39. Retrieved December 10, 2010, from the Google database.

Orasanu, J. (1986). Literacy in the Secondary School. *Reading comprehension: from research to practice* (p. 207). Hillsdale, N.J.: L. Erlbaum Associates.

Palincsar, A. & Brown, A. (1984). Reciprocal teaching of comprehension fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*, 117–175.

Palincsar, A.S., & Brown, A.L. (1986). Interactive teaching to promote independent learning from text. *The Reading Teacher*, 39, 771-777.

Palincsar, A.S., & Klenk, L. (1991). *Learning Dialogues to Promote Text Comprehension* (PHS Grant 059).  Bethesda, MD: National Institute of Health and Human Development.

Piaget, J. (1926). The language and thought of the child. New York: Harcourt Brace.

Raphael, T.E., & Wonnacott, C.A (1985). Heightening fourth-grade students' sensitivity to sources of information for answering questions. *Reading Research Quarterly,* 20, 282-296. Retrieved December 10, 2010, from Jstor database.

Rosenshine, B., Meister, C. (1994). Reciprocal teaching: A review of the research. *Review of Educational Research*, 64, 479-530.

Rosenshine, B., Meister, C., & Chapman, S. (1996). Teaching students to generate questions: a review of the intervention studies. *Review of Educational Research, 66* (2), 181 – 221.

Samavedham, L. (2006). Teaching Students to Think: A Matter of Engaging Minds. *Centre of Development and Teaching Learning*, *9*(2), 3.

Schwartz, D. (1989). Visual Ethnography: Using Photography in Qualitative Research. *Qualitative Sociology*, *12*(2), 119-154. Retrieved May 28, 2011, from the Academic Search Premier database.

Smith, M., & Lytle, S. L. (2009). *Inquiry as stance: practitioner research for the next generation*. New York: Teachers College Press.

Sporer, N., Brunstein, J., & Kieschke, U. (2009). Improving students' reading comprehension skills: Effects of strategy instruction and reciprocal teaching. *Learning and Instruction*, *19*(3), 272-286. Retrieved December 10, 2010, from the SciVerse Science Direct database.

Suh, S., & Trabasso, T. (1993). Inference during reading: Converging evidence from discourse analysis, talk-aloud protocols and recognition priming. *Journal of Memory and Language*, 32, 270-301.

Swain, S. (1998). Studying Teachers' Transformations: Reflection as Methodology. *Clearing House*, *72*(1), 28-34. Retrieved May 28, 2011, from the ERIC database.

Todd, R. B., & Tracey, D. H. (2006). Reciprocal Teaching and Comprehension: A single Subject Research Study, Kean University, 1-48.

Tompkins, G. (2006). Compendium of Instructional Procedures. *Literacy for the 21st century: a Balanced Approach* (4th ed., p. 495). Upper Saddle River, NJ Columbus, Ohio: Pearson Education/Merrill/Prentice Hall.

Tovani, C. (2000). Reading Comprehension - Yesterday and Today. *Choice Literacy*. Retrieved June 1, 2011, from www.choiceliteracy.com/public/421

Vygotsky, L.S. (1978). Mind in Society (Edited by M. Cole, V. John-Steiner, S. Scribner, & E. Souberman. Cambridge, MA: Harvard University Press.

Williams, J. (1973). Maturity Cards: An Alternative to the Letter Grade System. *The Journal of Higher Education*, *44*(8), 644-648.

Zeitvogel, K. (2010, December 7). AFP: US falls to average in education ranking. *Google*. Retrieved June 1, 2011, from http://www.google.com/hostednews/afp/article/ALeqM5juGFSx9LiPaur6eO1KJ AypB2ImVQ?docId=CNG.5337504e8f65acf16c57d5cac3cfe339

Zintz, M. V., and Z. R. Maggart. (1984). The Reading Process, the Teacher and the Learner. Dubuque, IA: Wm. C. Brown.