THE EFFECT OF METACOGNITIVE THINK-ALOUD STRATEGY ON READING COMPREHENSION OF KINDERGARTEN STUDENTS

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled THE EFFECT OF METACOGNITIVE THINK-ALOUD STRATEGY ON READING COMPREHENSION OF KINDERGARTEN STUDENTS by Kristi L. Bentley, Candidate for the Degree of Master of Science in Education, Curriculum and Instruction in Inclusive Education, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

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Abstract

Comprehension is the key to reading success. Best practices for teaching children to read conventionally begins in the Emergent Stage of literacy. In this study, five Kindergarten students participated in read-aloud lessons using high-quality children’s literature. The researcher taught students to use the metacognitive think-aloud strategy to increase story comprehension. Students then employed the strategy during read-aloud lessons in order to increase their comprehension. Treatment versus non-treatment sessions provided data to see the effectiveness of the metacognitive strategy on reading comprehension. Findings show that the metacognitive Think-Aloud strategy increases reading comprehension of Kindergarten students. The participants were identified as above average, average and below average in literacy skills, but there was an increase in overall comprehension assessment scores by all participants, showing that the participants internalized the strategy and were able to use it independently to increase their comprehension.
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Introduction

In a Kindergarten classroom, students are sitting on the carpet as they listen to Sylvester and the Magic Pebble by William Steig being read aloud by their teacher. The majority of the students are excited to look at the illustrations and see Sylvester’s journey unfold on each page. The story is about to reach an interesting point when Sylvester finds a shiny, red pebble. As he is sitting in the rain admiring his remarkable pebble, he wishes for the rain to stop. The teacher’s voice gets quiet as she begins reading the next page, “To his great surprise the rain stopped. It didn’t stop gradually as rains usually do”. She pauses, somewhat raises her voice, and continues reading, “It CEASED.” Some students were in awe as the teacher read about the sun coming up as if it hadn’t rained and the sunny illustration that brought together the story. Others did not seem phased by the rapid change in weather as Sylvester’s wish came true. Before turning the page, the teacher asked her students, “What do you think made the rain stop so quickly?” Hands shot up in the air as the students eagerly waited to be called on. She called on a few students, gave positive feedback as they contributed to the story, and continued reading.

How did the students respond to the teacher as she asks them to predict what event caused the rain to stop? Some responses may have been relevant, while others were completely off topic. The exposure to previous literacy experiences would sculpt the way in which a student would respond to such a prediction. The larger question at hand is: As the students give an answer to what event made the rain stop, do they know that they are using a thinking strategy, predicting to understand the story plot. Are they aware of their own thinking?

In 1966, Marie Clay first employed the term, “emergent literacy”, to refer to, “a period of a child’s life between birth and when the child can read and write at a conventional level”
(Tracey & Morrow, 2006, p.85). The Emergent Literacy Theory posits that children typically reach a conventional level of reading by third grade. Researchers define reading as a multifaceted cognitive process of decoding symbols for the purpose of constructing meaning (Gambrell, Morrow & Pressley, 2007). The process of reading is a complex system of skills needed to understand a given text, which accounts for students being functioning gatherers of information; rather than passive receivers of information. Following the Emergent Literacy theory, students’ abilities to comprehend a given text begin with their earliest experiences with print materials. Also, the theory proposes that the aspects of literacy: speaking, listening, reading and writing are interrelated in that if children are experienced in one aspect, they will easily learn to excel in the others. Accordingly, it is never too early to engage children in literate-rich activities.

Learning to read is the most important achievement children need to accomplish in their early years of school because it is the basis of their educational future, which is during the emergent stage of literacy. Therefore, reading instruction must be constant and ongoing in the classroom. Once students are able to effectively apply literacy skills to other contexts, they spend most of their time reading to learn about content area material and real-world applications. The notion that students are reading to learn as they reach a conventional level puts an extreme amount of pressure on early childhood educators to lay the foundation for students’ future endeavors by teaching reading through a comprehensive, balanced curriculum. However, educators are faced with a diverse population of students with differing needs and skill levels as students enter school. Students may enroll in Kindergarten with several literacy experiences such as being read to by parents or family members, having an array of children’s literature to explore at home and having attended formal “story hours”. In contrast, others may walk into
their Kindergarten classroom without ever having been in contact with a book or engaged in a literacy activity. From Kindergarten to third grade, educators must guide students in reaching a proficient level of reading, with the ability to understand the *what* and *why* of the reading process. But how do early childhood educators create a reading curriculum in order to develop conventional readers?

Before the comprehension revolution beginning in 1970, it was believed that students reached a proficient level of reading when they were able to decode symbols in order to read words and fluently recite a text. The focal point of reading instruction was skill-based training, which emphasized decoding activities, along with rigid phonics programs. However, reading is much more comprehensive. To be a strong reader, students need the skills to comprehend a text and the ability to implement cognitive strategies in order to deepen understanding, as well as with decoding skills and fluency. The past 30 years of existing research has narrowed in on the importance of comprehension instruction and how to effectively implement this instruction into reading programs. Comprehension has become known as a cognitive conceptualization theory, in which the reading process is purposeful and active (National Institute of Child Health and Human Development, 2000).

As an innovative Early Childhood Education teacher, it is essential that I develop an in-depth understanding of the reading process and what constitutes as an effective literacy program for emergent students. I want my students to be surrounded by high-quality children’s literature, allowing them choices to read about a variety of topics and interests. My goal is to motivate students to engage independently in the reading process, to encourage students to get lost in the adventures of a book and to help develop successful thinkers during the reading process. To
achieve my goal, I will constantly model the use of thinking strategies to understand and grasp the full concept of a text.

This research inquiry is based on the theoretical working of John Dewey and his strong influence on preschool and kindergarten practices, which consist of "themed units of study that connect learning to meaning and purpose" (Gambrell et al., 2007). Balanced comprehensive instruction significantly influences the inquiry, which is made up of the best evidence-based practices to meet the needs of all individual students (Gambrell et al., 2007). Lastly, the Whole Language Theory plays a role in the research problem, being that high-quality children's literature will be used. "Whole Language theory suggests that reading, like oral language, is a natural process that children will acquire if immersed in high-quality literacy environments and exposed to meaningful, authentic literacy experiences and high-quality literature" (Tracey & Morrow, 2006, p.59-60). The specific research question is: Can the implementation of the metacognitive Think-Aloud strategy with high quality children's literature increase reading comprehension of Kindergarten students?

A Literature Review

Comprehension has been termed the "essence of reading" (Durkin, 1978-1979), along with the ultimate goal of successful literacy (Gambrell et al., 2007). From their earliest experiences with print, children need to become mentally active learners who are motivated to succeed. To create such learners, the use of age and grade level appropriate literacy activities for beginning readers is crucial. Evidence-based best practices for literacy instruction are the most valuable to educators in order to create classroom cultures that encourage children to be successful readers. "The most basic goal of any literacy program should be the development of readers who can read and who choose to read" (Gambrell et al., 2007, p.19). Research
demonstrates that one of the most important activities for building success in literacy is reading aloud to children. The experience is most valuable when accompanied by interactive discussions between adults and children (Gambrell et al., 2007). Literacy conversations, as described above, allow for children to comprehend what is being portrayed throughout the story pages.

Reading comprehension, as a *process*, is an important aspect of early reading development. It is a skill that emerges early in a reader's life and continues throughout a lifetime (Alexander, 2006; Dooley, 2010). Development occurs in everyday contexts of the home, community, and school through meaningful and functional experiences that require the use of literacy in natural settings (Gambrell et al., 2007). The establishment of genuine connections between a young reader and a text can be constructed with high-quality children's literature. Teaching metacognitive strategies to young learners allows them to internalize meaning within the text. The National Reading Panel (NRP) defines comprehension strategies as “specific procedures that guide students to become aware of how well they are comprehending as they attempt to read and write” (National Institute of Child Health and Human Development, 2000, p. 4-40). In particular, the Think-Aloud strategy is an evidence-based method that increases reading comprehension (Klesi:is & Griffith, 1996; Liang, Peterson & Graves, 2005; Migyanka, Policastro & Lui, 2005; Santoro, Chard, Howard & Baker, 2008). The research in this study will answer the question: Can the implementation of the metacognitive Think-Aloud strategy with high quality children’s literature increase reading comprehension of Kindergarten students?

The NRP suggests that further research is needed on the effectiveness of specific comprehension strategies for emergent literacy students; therefore the research aims to respond to this need (National Institute of Child Health and Human Development, 2000). The bodies of literature reviewed will emphasize the investigation of best practices taught to emergent literacy
students in order to increase reading comprehension. To obtain the most accurate results, the review of literature will analyze: (1) Reading Comprehension, (2) Metacognition, (3) Think-Aloud Strategy, (4) Emergent Literacy Developmental Stage and (5) Children's Literature.

**Reading Comprehension**

Comprehension instruction.

The improvement of reading comprehension has been given much attention by the state and federal government in order to increase reading performance in schools (Reading First, No Child Left Behind Act [NCLB], 2009). Reading comprehension is the process of simultaneously extracting and constructing meaning through interaction and involvement with written language (Shanahan et al., 2010). Before the 1970's, text comprehension was used to understand content area material. However, it was overlooked when actually engaged in reading instruction. Within the last three decades, an array of research has found the process of comprehension to be more important than the notion of simply understanding the context. (National Institute of Child Health and Human Development, 2000) Comprehension instruction has changed into a view that reading is a functioning process, which leads researchers to theorize comprehension as a cognitive conceptualization of reading (National Institute of Child Health and Human Development, 2000). “According to this view [cognitive conceptualization of reading], a reader reads a text to understand what is read, to construct memory representations of what is understood, and to put this understanding to use” (National Institute of Child Health and Human Development, 2000, p.4-39). Research being conducted on how to teach comprehension is creating new methods of instruction within the classroom. “Data suggests that comprehension instruction should increase students’ abilities to understand text and technology-based print by
encouraging readers to be active in ways that good comprehenders are active” (Gambrell et al., 2007, p.225).

**Best practices in teaching comprehension.**

There is significant weight lying on a reader’s ability to comprehend while engaged in a literacy activity. A key component of successful literacy is the ability to comprehend a text. Comprehension instruction has made significant gains because of the research employed on the subject. Therefore, it is imperative that educators implement evidence-based teaching practices in order to help students become strong readers. Gambrell, Morrow and Pressley (2007) state that highly effective comprehension instruction comprises the learning activities that enable students to leave a reading experience with fresh perspectives, vital information, and new ideas. The teaching of cognitive strategy use to increase comprehension consists of: (1) a reader’s awareness development of the thought processes during reading that allow proficient understanding to occur, (2) a teacher modeling the techniques that a reader can use to amplify comprehension processes used during reading, (3) a reader practicing the use of strategies with teacher assistance until the reader attains a level of independency to effectively use those processes (National Institute of Child Health and Human Development, 2000). Stahl (2004) concludes that teacher questioning that employs student interactions throughout the reading process plays a vital role in enhancing student comprehension. By explicitly teaching strategies to students to comprehend text, students gain knowledge and ability to implement such strategies. From the earliest experiences with literacy, evidence-based practices need to be put into practice.

**Emergent literacy comprehension.**
The beginning behaviors and concepts that children develop and reinforce as they are introduced to literacy is known as the emergent stage, which in turn leads to conventional literacy (Dooley, 2010). The emergent stage begins at birth and is ongoing until children can employ the necessary steps of literacy and utilize them in any context, typically occurring in third grade (Tracey & Morrow, 2006). Emergent comprehension instruction is similar to the teaching of older students; younger students are able to utilize comprehension strategies through a more active and visible approach. Kindergarten teachers are able to use teaching instruction strategies from primary grades; adapted with developmentally appropriate and child-centered approaches to meet the needs of their students (Dorl, 2007). Teaching comprehension strategies to emergent literacy learners allows for meaning to be constructed and better understanding to be developed for what is read. A three-year study conducted by Strommen and Mates (1997) explored young students’ ideas about reading in order to determine if they would develop a progression of what readers do. The study consisted of eighteen three-year-old preschoolers who were followed on their educational path until the completion of Kindergarten at age five to six. To gather data of students’ perspectives on the reading process, the researchers used open-ended dialogue and provided a variety of reading material during 15-minute sessions with each student, five times each year. At the conclusion of the study, they found that children from age three to six connected print to meaning within a text when asked what readers do (Strommen & Mates, 1997). Researchers have found that from the earliest interactions, literacy activities create meaning and serve a profound purpose in the life of a child (Alexander, 2006; Dooley, 2010; Gregory & Cahill, 2010, Strommen & Mates, 1997).

Metacognition

Metacognitive strategies.
Metacognition is the process of thinking about one's own thinking (Tracey & Morrow, 2006). Teaching metacognitive strategies to emergent readers allows for comprehension to occur before, during and after literacy activities (Block & Israel, 2004; Dorl, 2007; McGee & Schickedanz, 2007; Santoro et al., 2008; Stahl, 2004). The use of modeling and scaffolding metacognitive strategies by educators enables children to master the task being presented. Once the task is learned effectively, children are likely to use it in order to create meaning while reading independently. Studies show that teaching students to use and implement multiple metacognitive strategies during the process of reading increases reading comprehension (Klinger et al., 2004; Newby, Caldwell & Recht, 1989; Rottman & Cross, 1990). When knowledgeable about multiple strategies, students are able to select the strategy, which best correlates with the activity at hand. These strategies include, but are not limited to: visualizing, summarizing, questioning, making connections, and predicting. At the conclusion of nearly three decades of research, Baumann, Seifert-Kessell, and Jones (1992) summarize that there is a sufficient amount of research in existence supporting the effectiveness of cognitive strategy training during reading as a way to improve students’ comprehension.

A federally funded project conducted by Baker, Chard and Edwards (2002) found that explicitly teaching metacognitive strategies during a read-aloud lesson format promotes increasing reading comprehension and overall performance of first-grade students as they are learning to read. The project developed a first grade curriculum, for three classrooms, to teach comprehension of narrative and informational texts during read-aloud time. To compare data and determine the affect of the instruction on comprehension, the researchers assessed students at risk for overall reading and high-achieving students. Also, a comparison was made between students in participating classrooms and students who were in classrooms where the curriculum
was not implemented (Baker, Chard and Edwards, 2002). The overall finding supports the
notion that teaching students in the emergent literacy stage to use comprehension strategies
during a read-aloud lesson are metacognitively aware of their strategy use and can speak more
thoroughly about comprehension (Baker et al., 2002).

**Metacognitive strategy instruction.**

The underlying question of metacognitive strategy instruction that researchers are gaining
evidence on is: What do readers think about thinking? Furthermore, researchers are interested in
"how what we know about how our own thought processes affect reading comprehension”
(National Institute of Child Health and Human Development, 2000, p.4-41). Research has
answered the inquiries above, stating that proficient readers retain a number of metacognitive
strategies during reading to assist them in comprehending the text (Tracey & Morrow, 2006).
The goal of metacognitive strategy instruction is to create successful readers who are aware of
their own thinking while in the *process* (Gambrell et al., 2007; National Institute of Child Health
and Human Development, 2000; Tracey & Morrow, 2006). To obtain this goal, educators
provide explicit instruction on the use of metacognitive techniques that students can apply
before, during and after reading (Block & Israel, 2004; Dorl, 2007; McGee & Schickedanz,
2007; Santoro et al., 2008; Stahl, 2004). Repeated scaffolding of the techniques in a natural way
is essential for students to grasp the idea and retain it for independent use. However,
metacognitive strategy instruction must take place through a gradual release of responsibility;
moving from the teacher to the student as the student is able to use the strategy autonomously
(Tracey & Morrow, 2006).

Block (1993) designed a strategy instruction curriculum in which teachers describe and
model a reading comprehension strategy. Then, students apply the comprehension strategy as
they read a selected piece of children’s literature (Block, 1993). The curriculum was implemented into three schools in the southwestern United States: one private and two public schools from grades two to six for 32 weeks. To show the effectiveness of the strategy instruction, control groups and experimental groups were randomly assigned to classrooms. The results of the study found that experimental students scored higher than control students on reading comprehension assessments, supporting the teaching of metacognitive strategies to succeed in the reading process (Block, 1993). When students become independent users of metacognitive strategies, they gain an awareness of their own thinking; in turn allowing them to become better readers (Anastasiou & Griva, 2009; Block, 1993; Klinger et al., 2004; Lavadenz, 2003).

**Awareness of metacognitive strategy use.**

Beginning in the 1970’s with researchers, Flavell and Brown, the subject of children’s awareness of comprehension while reading became a prominent question. The importance of being aware of metacognition as students are actively participating in literacy activities holds just as much value as the knowledge of the strategy itself. Flavell (1985) termed cognition as a “game”; when players are aware of a number and a variety of strategies, they become better players. Winners of this game are those who are successful in making sense of information and who can recall and use it effectively (Camahalan, 2006). When readers are aware of strategy use, they are more able to monitor their comprehension; creating more meaningful experiences (Anastasiou & Griva, 2009; Block, 1993; Camahalan, 2006; Klinger et al., 2004; Lavadenz, 2003). Block (1993) concluded her study [strategy instruction curriculum with control and experimental groups] by asking students to explain in writing the significant things that were learned throughout the year. The experimental students employed all elements of thinking in
their responses while control students only used the two least complex dimensions of thinking (Block, 1993). The results of the curriculum study found that experimental students were better than control students at applying thinking strategies to real-world situations occurring outside of school; supporting the notion that metacognitive awareness encourages strategic thinking in many contexts (Block, 1993). When students are aware of their own thinking throughout the reading process, they are developing active reading skills, which lead to the establishment of effective literacy skills (Gambrell et al., 2007). Specifically, an active metacognitive strategy that has been proven to build a strong foundation for young readers is thinking aloud during reading (Block & Israel, 2004; Dorn, 2007; Gregory & Cahill, 2010; McGee & Schickedanz, 2007; Migyanka et al., 2005; Liang et al., 2005; Santoro et al., 2008).

Think-Aloud Strategy

**Effectiveness of think-aloud strategy.**

A think-aloud is a useful strategy to introduce students to their own metacognition while engaged in a literacy activity (Dorn, 2007). Harris and Hodges (1995) define a think-aloud as “a metacognitive technique or strategy in which a teacher verbalizes thoughts aloud while reading a selection orally, thus modeling the process of comprehension” (p. 256). As teachers model the use of think-alouds, students are able to become independent consumers of the strategy, promoting more in-depth meaning making (Block & Israel, 2004; Dorn, 2007; Walker, 2005). Think-alouds enable readers to stop periodically, reflect on the thinking they do to understand a text, and relate these literacy processes orally (Block & Israel, 2004; Dorn, 2007). Think-aloud prompts activate students’ ability to verbalize their specific comprehension process and replicate that process more effectively in the future (Block & Israel, 2004). To increase comprehension through the use the think-aloud strategy, the age and grade level of students and the type of text
being read need to be analyzed (Gambrell et al., 2007). Think-aloud prompts allow students to comprehend a text by: over viewing the text, looking for important information, connecting to the author’s big idea, activating prior knowledge, placing self as a character in the text, predicting what will happen, recognizing an author’s writing style, determining word meanings, asking questions, noticing novelties in a text genre and formulating the author’s message, making self-to text connections, and making text-to-text connections (Block & Israel, 2004). Gregory and Cahill (2010) conducted an observational study in a Kindergarten classroom to determine how teachers can help young learners analyze a text critically and at what age do students begin to construct meaning. The results of the study show that young students are able to use think-aloud strategies such as activate prior knowledge, make connections, visualize, ask questions, and infer to create meaning within a text (Gregory & Cahill, 2010).

Thinking aloud with kindergarteners adds another layer of richness and depth to read-aloud time. Just as we point out visible features of a text, such as lowercase letters or periods, we also can point out the invisible elements of our own thinking and increase ‘the power of read-alouds in literacy development [Fisher et al., 2004, 15]’. (Dorl, 2007, p.101)

**Impact of think-aloud strategy on emergent literacy reading comprehension.**

Emergent literacy combines the aspects of speaking, listening, reading and writing for students to become conventional readers [functional level of literacy performance] (Tracey & Morrow, 2006). This emergent stage of literacy accounts for children at the time of birth until an independent reading level is reached; therefore it is developmental age, rather than a chronological age limit (Tracey & Morrow, 2006). “From early interactions children develop knowledge about how to comprehend in ways that are essential to conventional reading
comprehension development” (Dooley, 2010, p.120) The teacher’s role during this foundational stage is to systematically model the application of literacy concepts, skills or strategies in order to increase comprehension of a text (Tracey & Morrow, 2006). Comprehension of a text begins before students reach a conventional level of reading. As a result, thinking aloud is a useful strategy in emergent literacy classroom; a tool to introduce young students to metacognition and allow them to actively monitor their thoughts to increase their understanding (Dorl, 2007). Gambrell et al. (2007) point out that combining read alouds with interactive conversations leads to increasing comprehension of the story.

Children’s Literature

When emergent literacy students interact with literature in any literacy activity, they possess the ability to construct meaning (Gregory & Cahill, 2010). The creation of classroom cultures that promote reading motivation is essential for students to become competent and willing readers (Dooley, 2010; Gambrell et al., 2007). Students must be immersed with a variety of literature, in response to which they can create authentic, open-ended responses before, during and after reading. Therefore, a range of topics, cultural backgrounds and content areas need to be at the hand of students. Research on the use of high-quality children’s literature in emergent literacy classrooms has proven that the material is crucial to the engagement of students and their abilities to connect with the given text (Block, 1993; Dooley, 2010; Hare & Smith, 1982; Liang et al., 2005; McGee & Schickendanz, 2007; Santoro et al., 2008). McGee and Schickendanz (2007) have observed hundreds of interactive read-aloud lessons in preschool and kindergarten and conclude that the use of high-quality picture books allow students to connect easily to the text, infer character’s motivations and thoughts, predict what will happen, and enjoy the text. The use of children’s literature to increase meaning making occurs in a naturalistic setting.
because students find the text and illustrations to be, “more about everyday life” (Hare & Smith, 1982, p. 159).

Emergent comprehension is different than conventional comprehension because the end goal is not necessarily to derive adult-like meanings from texts. Emergent comprehension affords flexible, child-driven meaning making. More attention needs to be paid to comprehension as an all-important aspect of early reading development. (Dooley, 2010, p. 120)

The National Reading Panel Report of 2000 suggests further research is needed to determine whether certain metacognitive strategies are more appropriate for specific age and grade level students. Therefore, this research inquiry intends to contribute to that need. Also, the NRP suggests research on different text genres and the effectiveness of metacognitive strategies with comprehension of the text (National Institute of Child Health and Human Development, 2000). The results of this research will contribute to teachers’ understanding of ways to increase early literacy reading comprehension through the use of the metacognitive think-aloud strategy employed with high-quality children’s literature.

**Methodology**

The question of inquiry for the experimental design is: Can the implementation of the metacognitive Think-Aloud strategy using high-quality children’s literature increase reading comprehension of Kindergarten students?

**Participants**

Participants in this study are five Kindergarten students from one classroom with a total class size of fifteen students. The classroom is located in a small school district made up of three schools (Elementary, Middle, and High School) with a majority population of 1,389 white
students, 30 Hispanic or Latino, 7 African American, 1 American Indian or Alaska Native, 8 Asian, 2 Hawaiian or other Pacific Islander, and 4 other races alone. There are 102 students with disabilities within the school district who are served with Individualized Education Plans (IEP’s).

The age range of participants is five to six years of age; depending on the participants’ birthdays at the time of the study. The classroom teacher, on the basis of literacy skills and reading comprehension ability, chose six students to be evaluated in the study. The data collection from formative and summative assessments, obtained in the first two quarters of the school year, allowed the teacher to make an informed decision on the participants of the sample. However, only five participants completed the study. One student chosen by the teacher was not able to remain in the study due to lack of school attendance. The teacher was adamant about his participation in the study because of his low reading level and need for intervention, in order to increase his literacy skills. Therefore, the student was not replaced with another student from the class with permission to participate. The researcher and teacher hoped that he would be able to make up sessions, which did not occur. As a result, the sample consists of one student identified as below grade level, two students identified as at grade level and two students identified as above grade level in reading. The rationale for the small sample size is to obtain the most authentic data possible for the effect of the metacognitive strategy on reading comprehension; the participants’ different levels of literacy skills allows for a reliable measure of modification in reading comprehension, whether the results are positive or negative.

To begin the study, initial consent was obtained from the elementary principal of the school district; permission to conduct the study was given to the researcher (Appendix A). The researcher obtained informed consent from the students of the selected classroom from a permission slip that was signed individually by each student, with the option to disagree to
participation. The permission slip is age appropriate in that students were orally given the terms of the study in short by the researcher. The researcher directly read from the permission slip (Appendix B). All students in the classroom were asked to participate in the study. Then, a permission slip was sent home to students’ households in order to gain parental consent for students to participate (Appendix C). The purpose of the study, along with the methodology is explained in order for all parents and guardians to accept or deny participation of their child in the research. The five students selected for the sample were not disclosed to the classroom to secure confidentiality within the study. If any of the five students decided to exit the research at any time during the study, alternate students with informed consent to participate would be included in the study. All participants were notified prior to the research that there would be no negative impact for those who do not participate or choose to leave the study at any time.

Setting

The study took place at a high-needs elementary school located in the southwestern corner of New York State. The school district is a small, rural district that serves 1,441 students from Pre-Kindergarten through Grade 12. Also, the school district is marked as an operational Title 1 establishment. A Title 1 school is one which serves high numbers or percentages of poor children and receives financial assistance from state educational agencies (SEA’s) for the purpose of ensuring that all children meet the challenging state academic content and student academic achievement standards (U.S. Department of Education, 2008). One of the three inclusive Kindergarten classrooms of the school was the setting of the study; the principal suggested the classroom of choice because she believed that the teacher would participate enthusiastically.
The implementation of the metacognitive Think-Aloud strategy using high-quality children's literature began on March 5th, 2012 and research concluded on March 30th, 2012, during the third quarter of the school year. The study consisted of 10 research sessions. Research was not conducted during the second week of March due to scheduling issues of the researcher. Research sessions were held daily (Monday through Friday) with each one being 40 minutes in length.

**Design**

The purpose of the study was to implement the metacognitive Think-Aloud strategy using children's literature to increase reading comprehension of Kindergarten students. The research was based upon an ABAB design, which alternates treatment and non-treatment. For a total of ten days, the treatment to non-treatment design was put into practice within two separate sessions. Each session was allotted a forty minute time block, in which the researcher executed a read-aloud lesson on a piece of children's literature using the Think-Aloud strategy or negating the strategy. The participants were assessed on their reading comprehension at the conclusion of each session. Whether the session included the treatment or negated the treatment, the identical assessment was given to all participants; a comparison of assessment results determined the effectiveness of the treatment. Also, treatment sessions [those containing the think-aloud strategy] were audio-taped to make certain that authentic data was gathered. Adapted from Reading Rockets (2011), the audio taped sessions were transcribed using a *Think-Aloud Checklist* which recorded numerically how many times each think-aloud strategy was used by the participants, using a tally system (Appendix D).

The first four sessions of research inquiry was specified to teaching the participants the importance of cognitive thinking when engaged in a literacy activity. The researcher worked in a
small group consisting of all five participants to effectively teach the metacognitive Think-Aloud strategy techniques to achieve a more in-depth, cognitive understanding of the story content. “A think-aloud is a metacognitive technique or strategy in which a teacher verbalizes thoughts aloud while reading a selection orally, thus modeling the process of comprehension” (Harris & Hodges, 1995, p. 256). The think-aloud approach to increase reading comprehension while engaged in an activity such as reading can be implemented in many ways. Therefore, the first four sessions of research were used to teach different think-aloud techniques to the participants. The four selected Think-Aloud techniques that were utilized in the study were: (1) Predicting (What is next?), (2) Prior Background Knowledge (Using experience and previously learned material to make connections to the text), (3) Personal Response (Favorite part of story, likes and dislikes) and (4) Making Connections (Self-to-text and Text-to-text).

Metacognitive strategies need to be in use before, during and after reading in order for students to reflect on the material, apply the correct technique to the text and summarize what they have understood (Block & Israel, 2004; Dorl, 2007; Santoro et. al, 2008). Prior to implementation of the research, the use of the selected think-aloud technique (refer to four techniques listed above) correlated with the selected piece of children’s literature. The researcher taught each technique in a similar style to ensure validity within the study. The researcher used Dorl’s (2007?) three-chart model of effective think-alouds: “Preactive (before Reading) Thinking Strategies, Interactive (during Reading) Thinking Strategies and Reflective (after Reading) Thinking Strategies” (p.102). First, the researcher introduced the book elements: title, author, illustrator, front cover and visible characters. Next, the purpose of reading was set and the importance of using cognitive strategies while reading was highlighted by informing participants that good readers think about the point of reading before beginning (Block & Israel,
2004; Dorl, 2007; Santoro et al., 2008). Next, the researcher used the selected think-aloud technique of predicting, using prior knowledge, personal response or making connections for the given story to demonstrate how thinking strategies are applied to a text. The story was read aloud to the participants with set think-aloud prompts at appropriate check points within the text in order for the researcher to model interactive reading: thinking aloud when one reads to establish an understanding of the text (Dorl, 2007). At the conclusion of the story, thinking strategies were applied to the text to model how good readers reflect on a story to grasp the entire concept within (Dorl, 2007). To conclude the session, the participants were assessed on their comprehension of the story content.

To assess reading comprehension, the researcher used Sharon Taberski's Five-Finger Retell assessment (Readingrockets.org, 2011). Taberski is a renowned teacher with 28 years of experience in the early childhood field. Her research-based assessment is used across the United States as an alternate method to the traditional retell of a story, making retelling the story more interesting for students. Each finger represents one aspect of the story grammar. The thumb represents the characters in the story, pointer finger represents the setting of the story, the middle finger represents the problem of the story, the ring finger represents the events of the story and the pinky finger represents the conclusion to the story (Readingrockets.org, 2011). The assessment was given orally to the participants and the researcher scribed the answers on a recording sheet (Appendix E). At the end of the study, the data gathered from the assessments was compared by treatment and non-treatment. Also, the data was broken down by assessment questions in order to compare and contrast performance on each story element: characters, setting, problem, events and conclusion of the story. The transcriptions of audio-taped sessions
were reviewed to evaluate the effect of the metacognitive Think-Aloud strategy on reading comprehension.

The literature used within each session of treatment and non-treatment was authentic children's picture books. The researcher selected the literature from the American Booksellers Association (ABA). The books chosen were winners of the Randolph Caldecott Award, which were relevant to the age range of the participants (American Booksellers Association, 2011). The list of award-winning books was also chosen because of the credentials the books hold in order to reach the achievement of the Caldecott award. The Association for Library Service to Children, a division of the American Library Association awards the Randolph Caldecott Medal annually. The Caldecott medal honors the artist of the most renowned American picture book for children published in the United States during the previous year (American Booksellers Association, 2011). Being the only nationally recognized honor appropriate for the age and grade level of the participants, the Caldecott award winning books allowed the researcher to utilize well-written narratives and remarkable illustrations for the purpose of increasing comprehension. In addition to the honor, the selected books were evaluated using the Lexile Framework for Reading; a tool used to measure the difficulty of a text. A Lexile text measure is based on how difficult a text is to comprehend according to word frequency and sentence length. The content and design of the book affect the relationship between the reader and the text, along with the age and interests of the reader, which the Lexile measure also considers when scoring the specific book (MetaMetrics, 2012)

According to the design of the study, the metacognitive Think-Aloud strategy was implemented through a read-aloud lesson on the first session of research. The researcher read aloud a piece of children's literature, pausing in between text to give the participants an
opportunity to verbalize their thoughts using the Think-Aloud strategy prompts. The participants were then assessed on the specific book content to measure their comprehension of the story. The second session consisted of a read-aloud lesson without the metacognitive Think-Aloud strategy being employed. The researcher read the piece of literature to the participants without think aloud prompts. The exact assessment used in the first session was given to the participants to measure their comprehension of the story. The alternating treatment to non-treatment sessions were repeated three times, creating a total of six research sessions altogether.

**Findings**

First, the researcher presents the informal results collected during the first four teaching sessions. The first four sessions of this study were dedicated to teaching the four techniques that comprise the think-aloud strategy, specifically: (1) Predicting (What is next?), (2) Prior Background Knowledge (Using experience and previously learned material to make connections to the text), (3) Personal Response (Favorite part of story, Likes and Dislikes) and (4) Making Connections (Self-to-text, Text-to-text). The data collected during the teaching sessions was in the form of observational and reflective journal entries by the researcher, as there was not a formal assessment given to the participants at the conclusion of each teaching session. The sole purpose of the teaching sessions was to educate the participants on how to use each think-aloud technique to better understand the content of the story being read.

Following the four teaching sessions, the intervention part of the study began; the research sessions were based on an ABAB research design, which alternated treatment (Think-Aloud strategy modeled by researcher) versus non-treatment (Think-aloud strategy negated). The data was collected through a formal oral comprehension assessment, which was given individually to each participant at the conclusion of each session. Also, the sessions were audio-
taped in order to better obtain the quantitative number of times each think-aloud technique was used by the participants. The sum of data collected was analyzed to see what type of effect the think-aloud strategy had on the participants’ reading comprehension.

Participants

The participants in this study were previously selected by the classroom teacher on the basis of literacy skills shown on assessments and observations in the first two quarters of the school year. To begin the study, there were six participants enlisted, although the number decreased as the study continued. Due to the lack of school attendance, Participant F was eliminated from the study. Replacing the sixth participant never occurred, in hopes that Participant F would be able to make up missed sessions. The classroom teacher was very adamant about his participation because of alarmingly low literacy skills and the need for an intervention. He was present for two sessions throughout the study: one teaching session and one research session. His results were inconsistent and lacked significant information about the intervention. Therefore, the sample size was one less and consisted of two above average participants, two average participants and one below average participant in literacy.

*Participant A: Above average student in literacy*

*Participant B: Above average student in literacy*

*Participant C: Average student in literacy*

*Participant D: Average student in literacy*

*Participant E: Below Average student in literacy*

Teaching Sessions

The teaching sessions were designed to teach the importance and use of the Think-Aloud strategy techniques (metacognition) while engaged in literacy activities, specifically reading.
Using Dori’s (2007) three-chart model of effective think-alouds, the researcher taught the participants how to employ the think-aloud technique in order to fully comprehend the material being read. The schedule for each teaching session was as follows: (1) Introduce book elements (Title, author, illustrator, front cover and visible characters), (2) Set Purpose of Reading, (3) Describe specific think-aloud technique (4) Read-aloud with modeled think-aloud technique, (5) Reflect on story by discussing use of technique and story comprehension.

Predicting.

The first session introduced the think-aloud technique of predicting, as the researcher read *Sylvester and the Magic Pebble* by William Steig. To utilize the technique of predicting, a reader forms a guess of what is going to happen next. Following the researcher’s lead, the participants were successful in making predictions about the story content from looking at the title, front cover and visible characters. Throughout the read-aloud, the participants responded to the researcher’s comments and questions about the story content, while making predictions. Also, the participants were able to listen to one another, along with the researcher, and exchange thoughts and ideas about the story content. Each participant was given a chance to think “out loud” in order to understand what was happening throughout the story.

**Researcher:** The first time Sylvester asked for the rain to stop, it didn’t stop. What was different the second time Sylvester asked the rain to go away and the rain actually stopped and the sun came out?

**Participant C:** Sylvester was holding the pebble when he told the rain to go away. The pebble has to be in his hand so the wish comes true.

**Researcher:** What do you think Sylvester is going to do with the magic pebble?

**Participant B:** I think he is going to take the pebble and show his mom and dad.
At the conclusion of the story, the researcher and participants discussed how their predictions led them to the next part of the story. Not all predictions were accurate, however, the participants still voiced positive feelings about the technique. They were not discouraged when they predicted something that did not happen, because they were aware that the process of predicting helped them to understand the story content. The session concluded with the researcher and participants retelling the story aloud.

**Researcher:** Tell me what happened in the beginning of the story when Sylvester found the red shiny pebble.

**Participant E:** Sylvester found the red shiny pebble and it was a magic pebble. He made the rain stop. Sylvester was scared of the lion so he turned into a rock.

**Researcher:** Sylvester turning himself into a rock was the problem of the story because he was stuck as a rock. How did Sylvester finally turn back into a donkey?

**Participant D:** His mom and dad found the rock and had a picnic next to it. They found the magic pebble and said Sylvester would love it. They missed him and they wished for him to be back. And he turned back into himself.

**Researcher:** Sylvester was a rock for a year and went through all the seasons. Why did it take so long for Sylvester to turn back into himself when he was thinking the whole time that he wanted to be himself again?

**Participant A:** He couldn’t hold the pebble without arms so he stayed a rock. And his mom and dad didn’t know where he was so they looked and looked for him and they didn’t know he was a rock.

**Researcher:** What happened at the end of the story?

**Participant C:** Sylvester and his mom and dad hugged and went home. They were so happy that Sylvester was back and they hid the magic pebble so no one would turn into a rock again!

**Personal responding.**

Before introducing the second think-aloud technique, a participant commented on the previous learned technique of predicting. The other participants began a conversation on how to
predict and the importance of using the technique. As a group, the participants stated they “liked predicting”. Due to the fact that the participants were discussing the first technique taught, the researcher realized the need for a review session before teaching the next technique. Therefore, the researcher extended the discussion on predicting and allowed the participants to converse about the learned technique.

Next, the researcher introduced the second think-aloud technique of personal responding, while reading *A Sick Day for Amos McGee* by Phillip Christian Stead. A personal response to a story is when a reader states what he likes or dislikes or his favorite part of the story. The participants were actively engaged in the story, responding to the book at certain points by telling what they liked or disliked about the content. One example of making a personal response occurred when the animals boarded the bus to go see Amos McGee because he was sick at home and the participants reacted to the event in such a way:

**Participant C:** The elephant and rhino are too big to fit in the bus! I want to ride the bus with them.

**Participant B:** They are too big but they have to go see Amos because he takes care of them when he is at the zoo.

**Researcher:** You are right they are really big for the bus but I like that they are squeezing in there to go see Amos. They are nice friends to be doing that.

Although the second session was aimed to teach personal responding, the participants made predictions throughout the story as well. The researcher did not stop the participants from using both think-aloud techniques during the session because it was evidence that the participants were learning, as intended. Also, the researcher modified the original schedule of the teaching sessions, adding a review session of the think-aloud techniques previously learned as the opening of each teaching session to follow.

**Making connections.**
Following the newly revised schedule of the teaching sessions, the researcher and participants reviewed the two previously learned think-aloud techniques before learning the third technique. As a group, the participants remembered the two techniques and all contributed some information on how to use the techniques and the reason for their use.

**Researcher:** We have learned two think-aloud techniques to use when reading a story. They both help us to understand what is happening in the story. Can you tell me what they are?

**Participant A:** Making predictions.

**Participant C:** You have to guess what is coming next to make a prediction.

**Researcher:** You are right! Predicting is a good way to think about the story and see if your guess was right when you keep reading.

**Participant B:** I made predictions at home. And I guessed what was going to happen.

**Researcher:** Good, making predictions will help you become a better reader! What is the other technique we learned?

**Participant B:** Response. It means talking about the book.

**Researcher:** Yes, you're right. When you talk about the book as you read, it is easier to remember what happens in the story.

**Participant E:** You can tell your favorite part of the story and say what you like.

The third technique taught was making connections when reading *The Hello, Goodbye Window* by Norton Juster. A reader can make a connection in two ways: Self-to text connections or text-to text connections. When making a self-to text connection, the reader connects an element of the story to a previous experience he recalls or a characteristic of himself that correlates with the story. A text-to-text connection is one that connects the story being read to a previous read story that has similar features. The researcher modeled the technique by making self-to-text connections throughout the book. The participants followed in making their own
connections to the text. After reading the book, the researcher and participants discussed the
story content, along with the connections made.

**Researcher:** This book reminds me of my grandma’s house. She has a Hello, Goodbye window in her kitchen just like the characters in the book. She always looks out her window and she sees everyone who comes to her house before they see her. I used to go to my grandma’s house all the time and I still look for her in the window. Do you have someone in your family that you always visit?

**Participant D:** I always visit my grandma and grandpa at their house. I like going to their house because we do a lot of things.

**Researcher:** Is there something special at their house that is always the same like the window in the book or my grandma’s window?

**Participant D:** They always give me a kiss when I get there. My mom lets us spend the night.

Using prior background knowledge.

The fourth session, being the last of the teaching sessions, introduced the think-aloud technique of using prior knowledge. To use this technique, the reader draws upon previously learned material or earlier experiences that relate to the story in order to make a connection to the book or to recognize what the author is portraying. The technique was applied to the story, *A Snowy Day* by Ezra Jack Keats. The researcher prompted the participants to discuss what they knew about the book or the subject matter before reading. The participants responded with knowledge about the winter season and some events in the story due to previously reading the book. Also, the participants informed the researcher that they knew this book from singing the lyrics in music class. As the researcher read the first page of the book, all five participants sang the words that the researcher spoke, simultaneously.
**Researcher:** You all know what happens already, don’t you?

**Participant A:** Yes, we had this book in Kinder-Sing.

**Researcher:** Well, that’s great! You all can help me read the book since you already know what happens! See, this is how you use what you already learned to help you understand a book!

The researcher finished reading the book, pausing at points to model the use of prior knowledge, although the participants did not need as much guidance as with the first three techniques due to the book selection of the researcher. The participants were very vocal during this session because of their previous interactions with the book, which aided them in becoming experts on the story content. As a group, the participants retold the story, without any cues from the researcher.

The teaching sessions ended with a review of the four think-aloud techniques taught. The researcher and participants discussed the importance of using the techniques orally in order to understand story content and to help become better readers. The researcher explained the following six sessions to the participants and introduced the Five-Finger Comprehension Assessment to the participants by showing a visual of the assessment and explaining each element of the assessment: characters, setting, events, problem, and conclusion of the story.

**Research Sessions**

The following is a presentation of the formal statistics of this study, gathered during the remaining six research sessions, which alternated between treatment (Implementation of the Think-Aloud Strategy) and non-treatment (Negation of the Think-Aloud Strategy). The Five-Finger Retell Comprehension Assessment was conducted with each participant individually at the conclusion of every research session, which was an oral retell of the five story elements: (1) Characters, (2) Setting, (3) Problem, (4) Events and (5) Conclusion. The researcher recorded the
answers at the time of the assessment. Once the six research sessions were completed, the researcher then analyzed the data and scored the assessments with a percentage score. The assessments could not be scored using a universal scoring system because of the lack of uniformity within the assessment answers. Although the identical assessment was given at the end of each session, the story elements and the number of correct answers for each assessment differed according to the book read. The formula for scoring the assessment was as follows:

\[
\frac{\text{Answers Correct}}{\text{Possible Answers}} = \frac{X}{100} = \% \text{ Score}
\]

For each assessment, the above formula was used to calculate the total percentage earned. To find the total percentage, each assessment question was given a total number of possible answers. Then, each assessment question was graded individually. Next, the assessment questions were added to find the sum of correct answers. The percentage score was calculated by dividing the number of correct answers given by the number of possible answers. The percentages were rounded up to the nearest whole number.

EXAMPLE OF ASSESSMENT SCORING FORMULA

Participant X, Assessment 1:

- **Characters**: 3 Correct/ 5 Possible = 60%
- **Setting**: 1 Correct/ 1 Possible = 100%
- **Problem**: 1 Correct/ 1 Possible = 100%
- **Events**: 2 Correct/ 4 Possible = 50%
- **Conclusion**: 0 Correct/ 1 Possible = 0%

Total Assessment: 7 Correct/ 12 Possible = 58.333%

**Total Assessment 1: 58%**

The data was disaggregated by treatment to non-treatment sessions of overall assessment scores, to determine what, if any, affect the think-aloud strategy had on comprehension. Next,
the data collected from the Think-Aloud Checklist, which calculated the number of times each think-aloud technique was used by the participants during each session, was considered in comparison to overall assessment scores and participant performance. Each assessment question was then examined separately to distinguish if the treatment had a different affect on any one aspect of the story content. The total assessment scores were then analyzed by participant to see if there were any significant results within each participant’s assessment scores or between the participants, when compared to one another.

Lastly, the *Lexile* Text Measure of each book was compared within the analysis of the data points in order to isolate the distinct reason for the exact study results. The *Lexile* Text Measure is a good indicator of how well the reader should comprehend the selected book: A quantitative number is applied to each book in order to help a reader find a book at the appropriate level of difficulty (MetaMetrics, 2012). A measure may have the letters AD in front of the number score, meaning adult directed. According to the *Lexile Framework for Reading*, most picture books are labeled with AD due to the fact that the specific book is appropriate for children learning to read who may need adult assistance. Following the number score is the letter L, which simply means Lexile, signifying the *Lexile Framework for Reading* system scored the book (MetaMetrics, 2012).

The list of authentic children’s literature was preselected before the research began from the Caldecott Winning Book List. The preselected list serves the purpose of an appropriate read-aloud lesson, as the illustrations are meant to help comprehend the story content. After the research sessions were concluded, the *Lexile* Text Measure was identified for each piece of children’s literature in order to compare the comprehension levels. The book title, author and
Lexile Text Measure were configured together to compare the material used in each session to the identified comprehension level.

Table 1: Research Session Book List

<table>
<thead>
<tr>
<th>Session Type/ Session #/ Think-Aloud Technique Modeled</th>
<th>Book Title/ Author</th>
<th>Lexile Text Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Session #1 Using Prior Background Knowledge</td>
<td>Where the Wild Things Are by Maurice Sendak</td>
<td>AD740L</td>
</tr>
<tr>
<td>Non-Treatment Session #2</td>
<td>The Man Who Walked between Two Towers by Mordecai Gerstein</td>
<td>AD480L</td>
</tr>
<tr>
<td>Treatment Session #3 Making Connections</td>
<td>Why Mosquitoes Buzz in People’s Ears by Leo Dillon</td>
<td>770L</td>
</tr>
<tr>
<td>Non-Treatment Session #4</td>
<td>Snowflake Bentley by Jacqueline Briggs Martin</td>
<td>AD830L</td>
</tr>
<tr>
<td>Treatment Session #5 Personal Responding</td>
<td>Jumani by Chris Van Allsburg</td>
<td>AD620L</td>
</tr>
<tr>
<td>Non-Treatment Session #6</td>
<td>Owl Moon by Jane Yolen</td>
<td>630L</td>
</tr>
</tbody>
</table>

The following graphs present a visual of the data gathered in order to see the effects of the think-aloud strategy on reading comprehension of the participants. To find the most significant outcomes of the research, the average scores of all participants were calculated and displayed visually. The research sessions, which followed an ABAB research design, began with a treatment session, followed by a non-treatment session, which one can see represented in the graphs, alternating black and white.

**Overall comprehension assessment scores.**

Figure 1 shows the average overall comprehension assessment score for each research session. As one can see on figure 1, the treatment sessions that involved the modeling of the think-aloud strategy generated higher assessment scores than the non-treatment sessions, which were strictly completed with a read-aloud lesson, lacking any type of active learning.
Although, the overall comprehension scores lacked a large amount of variation, the researcher reports that the participants were more active during the treatment sessions, where they were imitating the researcher as they used the specific think-aloud technique being modeled. The participants’ input to the read-aloud lesson was documented through audio recording of each session, treatment and non-treatment alike. The researcher reports that the participants were actively engaging in the book content during the treatment sessions. They vocalized their understanding of the story as they used the specific think-aloud technique. During the non-treatment sessions, the researcher reports that the participants were passively listening to the story without much interaction. There were fewer interactive statements and conversations from the participants during the non-treatment sessions, which correlate with lower assessment scores.

**Use of think-aloud strategy.**

The participants’ use of the think-aloud strategy was more frequent during the treatment sessions, which also facilitated better overall assessment scores. Hence, there appears to be a positive relationship between the use of the think-aloud strategy and overall assessment scores (See Figure 1 and Figure 2). The relationship between the two variables show the significance of using the think-aloud strategy to improve comprehension.
Although the non-treatment sessions yielded lower numbers of think-aloud strategy use, as the sessions increased, the presence of the think-aloud strategy increased. As the participants completed more treatment sessions and modeling of the think-aloud techniques by the researcher, they were able to use the think-aloud techniques more independently. The data from the audio-taped research sessions calculated the number of times each think-aloud technique was used by the participants, either with the aid of the researcher or independently.

Table 2: Use of Specific Think-Aloud Techniques

<table>
<thead>
<tr>
<th>Think-Aloud Strategy Technique</th>
<th>Think-Aloud Technique: Predicting</th>
<th>Think-Aloud Technique: Using Prior Background Knowledge</th>
<th>Think-Aloud Technique: Personal Responding</th>
<th>Think-Aloud Technique: Making Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Type/Session #</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment Session #1</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Non-Treatment Session #2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Treatment Session #3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Non-Treatment Session #4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Treatment Session #5</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Non-Treatment Session #6</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Each treatment session was based on a different think-aloud technique, which the researcher modeled for the participants. The order of think-aloud techniques modeled were as follows: (1) Treatment #1: Using prior background knowledge, (2) Treatment #2: Making connections, (3) Personal responding. There is a relationship established between the use of the think-aloud techniques and the overall assessment scores of the participants. During the treatment sessions, when the researcher modeled a think-aloud technique, the participants’ overall comprehension scores were higher (See Figure 1 and 2, Table 2). Therefore, suggesting that the intervention, being the modeling of the think-aloud strategy, increased the participants’ comprehension of the story. During the last non-treatment session of the research, the participants’ overall comprehension scores increased, breaking the pattern of treatment to non-treatment, with the treatment sessions producing higher comprehension scores. By examining the increase in comprehension scores with the individual use of the think-aloud techniques, the data suggests that the participants internalized the think-aloud techniques and were able to employ them in a more constructive way during the last non-treatment session. The participants applied the think-aloud techniques to the story more often when the researcher modeled the technique throughout the session (See Figure 1 and Table 2). Also, the researcher reports that the participants discussed the story elements before, during and after more in depth during the treatment sessions, as the participants’ responses were more reflective of the story content. During non-treatment sessions the participants did not use the think-aloud techniques as frequently, suggesting the need for the modeling of the techniques to occur in order for the intervention to aid comprehension.

During some sessions, treatment and non-treatment, the participants did not use the think-aloud techniques: using prior background knowledge, personal responding and making
connections. The think-aloud technique of predicting was present within each research session. The data suggests that the participants related more to making predictions to help comprehend the story than the other think-aloud techniques.

**Specific story elements.**

The assessments were split apart by specific story element and were configured to see what affect the think-aloud strategy had on each one. The Five-Finger Retell Comprehension Assessment tested the participants on the story elements: (1) Characters, (2) Setting, (3) Problem, (4) Events and (5) Conclusion. The average score for each assessment question was calculated in order to see what elements of the story the participants understood more often than others. The researcher analyzed the results for each assessment question to find that the participants excelled when identifying the characters of the story. Also, the relationship between increased comprehension scores and the intervention, which occurred during treatment sessions, was evident as the participants stated the conclusion of the stories. Figures 3 and 4 represent the summary of data collection from assessing the characters and the conclusion of the stories read, respectively. For all assessment question summaries, see Appendix F.

**Characters.**

![Figure 3: Average Character Comprehension Score](image)
The participants scored consistently well in each session when naming the characters of the story. In comparison to the other four assessment questions, the participants scored higher in the identification of characters than any other story element. Collectively, this trend of higher scores for character identification was evident in all of the research sessions. Figure 3 shows evidence of positive results on the identification of the characters of the stories read.

During the third non-treatment session, the average score fell by 26 points however the number of characters in the book: *Why Mosquitoes Buzz in People's Ears* by Leo Dillon, for the session was much higher than the rest of the books with a total of nine characters. The decline in scores was present across the board, with all participants scoring below their previous scores. According to the Lexile Text Measure, the book read during the third research session, scored at a higher level of comprehension ability (770L) than most of the other books read. The fourth session had the highest Lexile Text Measure score (AD830L), which is where the participants scored the lowest when naming characters. The complexity of the reading materials may have had an effect on the participants' reading comprehension, as the assessments reveal a decline in scores for both sessions. In the last two research sessions, the fifth treatment session and the sixth non-treatment session, the participants scored perfectly, correctly naming all of the characters in each story. The high average score of the last session, which did not include the modeling of the think-aloud strategy by the researcher, suggests that the participants were able to use the think-aloud strategy independently to comprehend the text better than in the previous sessions. Explicitly, the data proposes, again, that the participants internalized the think-aloud strategy in order to increase comprehension, particularly character comprehension (See Figure 3 and Table 2).
**Conclusion.**

For the purpose of showing clear evidence of the positive relationship between the think-aloud strategy and increased comprehension, the focus is on the conclusion of the story, which produced higher average assessment scores during treatment sessions than non-treatment sessions.

**Figure 4: Average Conclusion Comprehension Score**

![Bar graph showing comprehension scores](image)

In the first four research sessions, there was a repeating pattern, which reveals the participants’ increased level of comprehension during the treatment sessions. For treatment session one, the participants scored an average of 80 percent correct. In the second session, which was a non-treatment session, the score dropped by 50 points, making the average score 30 percent (See Above Figure 4), along with use of the think-aloud strategy also dropping from 17 to three. When comparing the first two sessions, the participants scored higher on the conclusion question of the assessment as they orally expressed their understanding using the think-aloud strategy. During the third treatment session and the fourth non-treatment session, the identical pattern appears with the average score being higher and the use of the think-aloud strategy occurring more in the treatment session. However, the fifth treatment session data shows a
change in the repeating pattern with a decline in the average score. The participants’ average score decreased by 20 points, which may be due to the more complex ideas presented in the book, *Snowflake Bentley* by Jacqueline Briggs Martin. The Lexile Text Measure scored the book at AD860L, which is the highest text measure within the children’s literature implemented into the research. Yet, in the last non-treatment session, the average score increased by 30 points from the previous session. This fact supports the previously stated hypothesis that the participants internalized the think-aloud strategy and were able to implement it to increase their comprehension of the story conclusion.

**Individual participant scores.**

**Figure 5: Individual Participant Comprehension Assessment Score**

When comparing three of the participants who were all identified to be at different reading levels by the classroom teacher when the study began, the overall assessment scores are more in line with one another than dissimilar (See Figure 5). Participant A, who was identified as an above average literacy student, and Participant C, who was identified as an average literacy student showed the largest gap with 11 points separating their scores in treatment session one.
Their scores were closer in every other session and identical in two sessions. During sessions one and three, the Participant C scored higher than Participant A. The scores do not reflect the participants' identified literacy levels, as Participant A was expected to score higher than Participant C. Participant E's results, who was identified as a below average literacy student, follow the pattern of the two more advanced participants, achieving a higher score when the two others also scored higher and scoring lower when the two others scored somewhat lower. The three participants show a similar pattern of scores; they obtained higher scores during the treatment sessions when compared to the non-treatment sessions. Participant E also scored higher than and identical to Participant C during sessions two and five, respectively. The data from the individual participant assessment scores suggest the think-aloud strategy aided all of the participants in comprehending the stories: This think-aloud strategy while compensating for cognitive ability or eliminating differences in literacy skill levels. When examining the assessment scores, the participants appear to be more similar than diverse in skill level. To examine all of the participants' scores, see Appendix F.

**Discussion**

These results provide initial evidence that the implementation of the metacognitive Think-Aloud strategy during read-aloud lessons can aid students' reading comprehension. The overall comprehension assessment scores were higher when the researcher utilized the think-aloud strategy during treatment sessions, therefore supporting the hypothesis that explicit teaching of the specific metacognitive reading strategy levels the playing field for all students. Performance is no longer based exclusively on cognitive skills but rather on the level to which a student uses metacognition to enhance learning and ability. The assessment gains were seen in all the participants: that is those identified as above to below average literacy skilled students.
Reading Comprehension

To become a successful reader, one must understand the purpose of the text and what the words are conveying. The reader must gain a sense of knowledge when engaged in a literacy activity; therefore comprehension has become the major goal of reading. Research being conducted in the field of reading comprehension emphasizes the importance of the process of comprehension, more so than the product of comprehension (Reading First, NCLB, 2009), which parallels with the results found in this study. Gains in reading comprehension occurred more often during the treatment sessions of research during which the researcher implemented the metacognitive think-aloud strategy as a model for participants to follow. Creating an engaging read-aloud that fully involved the participants, the researcher focused on the process of comprehension. When students understand a given text, they should be able to apply the information retained and use it for further learning. Therefore, comprehension is a functioning process in that students gain an awareness of their understanding as they are engaged in a literacy activity. The participants were able to extract and construct meaning through interactions with the text as the researcher read aloud.

Emergent Literacy Instruction

Emergent literacy begins at birth and is ongoing until a reader reaches a conventional level. That being said, a conventional reading level is met when a student can understand a text in order to gain new knowledge and insight. This study aimed to help emergent literacy students, who were the participants, gain the necessary skills needed to become conventional readers.

Prior to the last three decades of research on the reading process, it was thought that conventional reading was the process of decoding words and fluently reciting the text. Consequently, educators of emergent literacy students relied on phonics instruction to teach
word decoding and repetitious reading of similar books to increase reading fluency.

Comprehension of a text was overlooked as the need for decoding and fluency skills were stressed. However, once a student was able to distinguish words from one another and read through them effortlessly, was meaning from the text being constructed? No is the answer, as many researchers have proven this fact through studying the process of reading.

Today, the emphasis of successful reading is placed on comprehending a text and the active process in which a reader constructs meaning while decoding a text. The prerequisite skills needed for any successful literacy activity are embedded in a student in the emerging literacy years. The design of this study was created for the purpose of supporting recent research in the field of emergent literacy and the teaching of the specific comprehensive skills needed to reach a conventional reading level.

The delivery of information to the participants within this study is one of the most important activities during the emergent literacy stage, which clearly reflects evidence-based best practices: interactive read-alouds. Reading aloud to students is one of the most influential activities a teacher can do to model the importance of reading, along with the creation of comprehensive learners. Text comprehension is established during the emergent stage of literacy, which begins at birth and lasts until a proficient reading level is reached. Therefore, the teacher’s position during this prerequisite period is to model the skills needed for students to understand a given text whether it be spoken or written in order to become a proficient reader.

Metacognition

When asked about the purpose of using the think-aloud strategy during reading, Participant E, who was identified as a below average literacy student, replied, “We think about what we are thinking about when we read”. Participant E stated this during the last teaching
session of the study. He was exposed to four metacognitive read-aloud sessions, where he became an effective force in his own comprehension. Tracey and Morrow (2006) define metacognition as the process of thinking about one’s own thinking. A comparison of the two definitions suggests that the participants in this study understood the key component of reading comprehension; taking control of one’s own metacognitive thoughts by putting them into practice in order to learn to read. This is a very bold statement for an identified below average literacy student, whose assessment scores followed the pattern of the four other participants throughout the research sessions, who were identified as above average and average literacy students. Data shows an increase in all of the participants’ reading comprehension as the study progressed, which suggests that explicit teaching of metacognitive strategies creates an equal pathway for all emergent literacy students to learn to read successfully. Cognitive skills and previous experiences that generally place a student at a certain reading level, as the participants in this study were placed from below to above average, no longer determine what type of reader the student will be.

Teaching metacognitive strategies to emerging readers gives students the tools needed to take control of their own learning. When comparing the assessment scores from each research session, the researcher found that Participant E’s ability to comprehend a story improved as the study progressed. The researcher also observed an increase in interactions from Participant E, as he was more likely to engage in reflective conversations with the researcher and the other participants. Therefore, it was evident that Participant E, who was identified as the only below average literacy student, was taking control of his own learning as a reader. The direct teaching of the metacognitive think-aloud strategy, in the form of four detailed techniques, allowed the
researcher to embed into the participants of the study the necessary comprehensive skills needed to become competent readers.

**Think-Aloud Strategy Instruction**

At the Kindergarten level, the teacher’s role is to model the skills needed to become an active reader, which is exactly what the researcher set out to achieve with the teaching and modeling of the think-aloud strategy. A think-aloud is a technique used to verbalize one’s thoughts aloud while reading, in order to facilitate comprehension. As the participants learned how to implement the think-aloud strategy during a read-aloud lesson, through four specific techniques, they were better able to take control of their own thinking and guide themselves through understanding the story content. Higher assessment scores achieved during treatment sessions, which consisted of the modeling of the think-aloud strategy, indicate the effectiveness of the think-aloud strategy on reading comprehension.

Ending the research with the sixth non-treatment session, the participants scored higher on the comprehension assessment than the previous treatment session. Along with higher assessment scores, the participants used the think-aloud techniques more in the last session than the previous session. This data supports the idea of internalization of the think-aloud strategy by the participants. They were able to implement the metacognitive strategy independently in order to increase their comprehension of the story. As the participants’ exposure to the think-aloud strategy through explicit teaching and modeling by the researcher increased, their independent use of the strategy and their oral responses to the strategy increased. The participants’ ability to control their metacognition, as a tool to comprehend the given text, developed as the research progressed, showing that the intervention was constructive to the participants’ comprehension and their ability to use the think-aloud strategy as a tool to understanding and reading.
From the list of the four techniques that encompass the think-aloud strategy in this study, the participants used the think-aloud technique of predicting most frequently. In every research session, the participants made predictions; but the researcher did not model the think-aloud technique of predicting during those sessions. The participants were only exposed to predicting in the first teaching session, which led the researcher to believe that the participants connected more to the specific technique than the other three techniques. The think-aloud technique of predicting is an effective way to introduce students to their own thinking while engaged in a literacy activity (Dorl, 2007). Making predictions as to what is going to happen next allows a reader to reflect on the present and speculate on the upcoming events, which is an extremely age-appropriate concept for emergent literacy students, who made up the sample of this study. Data from the Think-Aloud Checklist gathered in each research session confirms the idea that making predictions allows students to think about their comprehension during a read-aloud lesson.

**Children's Literature**

A valuable piece of this research was the material used for the implementation of the think-aloud strategy to model cognitive thinking. The selection of children's books used in this study directly connected the level of reading and appropriate subject matter to the age and grade level of the participants. Specifically, the Caldecott Award winning books allowed the participants to construct meaning using visuals from the strong illustrations, along with the suitable language. Research has proven that the implementation of high-quality children's literature, such as the Caldecott Award winners, openly engages emergent literacy students before, during and after reading. The illustrations within each book help students connect to the text on a deeper level by providing visuals to guide their comprehension in a meaningful way. The link between the text and illustrations carves a direct path to active meaning making, as the
students interact with both elements to create meaning within the story. The literature guided the participants in creating open-ended, authentic responses in order to increase their comprehension of the story. The participants were fully aware of the honor the books received, as they commented on the “golden circle” on the front cover, which increased the appeal of the books. The researcher explained the reason for the repeating shape on every front cover by accentuating the author and illustrator’s desire to bring the content of the story alive on the pages, in order for students to see what is happening as they read. The participants recalled the credentials of the Caldecott Award during each session and commented on the high quality of the book. If students are familiar with age and grade level appropriate books, they can become discriminatory readers, who enjoy reading as they use the pictures as a tool to understand the content of the book. Also, students will become naturalistic in their quality selection of reading materials, allowing them to draw meaning in their everyday settings. The goal of educators today is to create active learners with a strong desire to read and a conscious sense of their learning pathways, who can take full control of their own thinking in order to understand the material at hand. By exposing emergent readers to a variety of authentic literature covering an array of cultural backgrounds and content areas, they will gain the knowledge needed to independently grow as comprehensive learners, with the ability to understand their own metacognition.

Limitations

Findings from this research study confirmed that teaching metacognition through the modeling of the think-aloud strategy improves students’ reading comprehension, specifically emergent literacy students. However, limitations suggest more time should be allotted to the study of metacognition. The results may have provided a stronger analysis for the intervention if the study would have been expanded over a longer period of time. The study consisted of 10
sessions: Four teaching sessions followed by six research sessions. In order for emergent literacy students to learn how to use the think-aloud strategy independently for the purpose of increasing comprehension, they need to have more literacy experiences with the strategy being modeled for them. Therefore, more teaching sessions would have allowed the students to commit the strategy to memory. Also, with the addition of more research sessions, the researcher could have gathered more data on the effectiveness of the intervention.

The ABAB research design of the study created a straightforward comparison of the treatment versus non-treatment results. The first research session was a treatment session, which implemented the modeling of the think-aloud strategy, which was a limiting factor because the researcher did not have quantitative baseline data to compare the treatment sessions to. The classroom teacher selected the participants on the basis of literacy skills from her observations and classroom assessments. The researcher did not receive any evidence of the identified participants, therefore lacking data to compare the intervention to, other than the non-treatment data.

A last limitation of the study was the selected children's literature that was implemented into the research sessions. The researcher was informed of the Lexile Reading Framework scoring system after the completion of the research sessions, therefore identifying the Lexile Text Measure at the conclusion of the study. If the LExile Text Measure would have been identified for each book before the study began, the researcher could have selected a list of books with a similar text measure and an equal comprehension level. The books read may have affected the comprehension assessment scores of the participants during the research sessions because of the varying levels of comprehension the books were identified at. Still, the study was conducted with a list of nationally recognized books that connect brilliant illustrations with
appropriate language for emergent literacy students. The books allowed the students to use the metacognitive strategy as a resource for increasing comprehension.

Further Research

The present study supports the theory that reading is a functioning process, in which comprehension is gained through active engagement within a literacy activity, such as reading. The researcher designed the study to see what effect the use of metacognitive think-aloud strategy had on emergent literacy students’ reading comprehension, specifically Kindergarten students. The results of the study demonstrated the importance of teaching metacognition to emergent readers in order for them to gain the necessary thinking skills to understand a given text. The population of this study has not yet reached a conventional level of reading, where they can use reading as a tool for learning. Further research on metacognition should be conducted with many other populations to see what effect the teaching of these certain skills can do for other students. In particular, teaching metacognitive strategies to conventional readers in middle school and high school would be valuable research. Metacognition not only helps students to become successful readers but also helps students read to understand different subject matter. If students were taught to use metacognitive strategies when reading history or science content, they could reflect on what is being read as they are reading and locate the exact point where comprehension was lost.

The participants in this study showed significant gains in their comprehension levels as they were exposed to the think-aloud strategy and were able to use it during a literacy activity more independently. Participant E, who was identified as a below average literacy student, scored higher than the other participants in some of the research sessions. Participant E’s progress through this specific intervention leads the researcher to believe that students who are
identified as at risk for reading should be taught metacognitive strategies in order to increase their comprehensive skills. The best intervention begins at the earliest onset of struggle. Teaching at risk literacy students how to use their own thinking to understand what the story is portraying will assist them in becoming successful readers. Also, teaching metacognition to young at risk students can be done through interactive read-alouds, which are easy to implement on a daily basis. Student experience connecting metacognition to literacy skills allows for growth to occur. When at risk students lack literacy skills and previous experiences to shape these literacy skills, teaching them metacognitive strategies, such as the think-aloud strategy will give them the skills needed to become successful readers.

**Future Implications**

Findings from this study present the need for early childhood education teachers to implement metacognitive strategies into daily read-alouds for the purpose of establishing the necessary comprehensive skills in young readers. There is not enough attention focused on the reading comprehension and the *process* through which a reader understands a given text. As a society, we seem to concentrate on the end result, rather than the mechanics to creating the end result. Therefore, teaching emergent literacy students to think about their own thinking as they listen to a story or interact in another literacy activity is crucial to their development as successful learners. Also, the reliance on test scores and quantitative numbers is a direct result of many students' low reading levels and lack of competence as a learner. Therefore, the emphasis teachers place on assessment scores needs to decrease, while the explicit teaching of metacognitive thinking strategies increases, in hopes of creating open-ended learners who can think out of the box and use a set of precise skills to comprehend any subject matter.
The results of this study concurred with other researchers in the literacy field, summarizing that metacognitive strategy instruction can increase reading comprehension in Kindergarten students. Also, the teaching of specific thinking strategies can provide students with a set of skills needed to become successful comprehensive learners.

It is never too early to begin teaching children how to think abstractly. Thus, it is necessary to read aloud to children beginning at birth, when the emergent literacy stage initially begins. Not only do parents and educators need to read aloud to children, they need to introduce them to the interactive aspect of books, by modeling active and engaging strategies, in a enjoyable way. When children are exposed to many different learning experiences before they reach Kindergarten, they are more likely to think conceptually in order to gain and retain knowledge when they enter school. Findings from this research show that the participants who were identified as above average and average literacy students may not necessarily have been more skilled than the identified below average literacy student but were exposed to more literacy activities involving abstract thinking before entering Kindergarten.

Early childhood educators, such as childcare providers, need to provide children with literacy experiences in the most naturalistic ways through everyday experiences. The most powerful way to teach children how to use their own metacognition at such a young age is to submerge them into a variety of literary materials and experiences that connect to their lives and their play interactions with peers. Their curious imaginations will be sparked as they encounter different educational experiences, exposing them to the metacognitive strategies, which they are not aware of yet. The overall increase in comprehension assessment scores within all of the participants in this study provide evidence that the modeling of metacognitive strategies can create equal opportunities for students at all skill levels to succeed as readers.
According to recent research in the field of literacy, the key to successful reading is the ability to comprehend a text. The process of comprehension has been proven to be an important aspect of becoming a strong and independent reader, which translates into a successful learner. This research study was designed with an expectation to focus on teaching the process of comprehending a text by teaching the metacognitive think-aloud strategy to emergent readers. The researcher found that the explicit teaching of the metacognitive think-aloud strategy allows all students, ranging in skill ability and previous experiences, to become active players in the game of comprehension. Taken as a whole, the results of this study prove that teaching metacognitive strategies to Kindergarten students increases their reading comprehension. Also, the researcher observed many comprehensive interactions between the participants and the literature read during the read-aloud lessons, which led to the conclusion that the participants gained insight on the importance of thinking about their own thinking as they are engaged in a literacy activity. The participants were demonstrating their active control of their metacognition as they participated in the research sessions. They internalized the think-aloud strategy and used it independently to increase their understanding of the given texts. Overall, the research set out to prove that the process of reading is more than word identification and fluency but the abstract thinking of what is being portrayed through the text. Comprehension is an active process that students need to be in control of as they use their metacognition to guide themselves through a given text. Reading is the foundation of successful learning, therefore students need to be taught the how and why to reading.
References


Appendix
Appendix A: Research Building Principal Approval Form

**RESEARCH BUILDING PRINCIPAL APPROVAL**

1. __________________________________________, as the Principal of the Elementary School give permission to Kristi Bentley to conduct the research study, *Effect of Metacognitive Think-Aloud Strategy on Reading Comprehension of Kindergarten Students*. The research will take place in a Kindergarten classroom during the months of February and March of 2012.

Signature ______________________________

Date ______________________________
Appendix B: Student Consent Form

**STUDENT CONSENT FORM**

Hi, my name is Kristi Bentley. I teach preschool at Chautauqua Lake Childcare Center. I am currently completing my Master’s degree at SUNY Fredonia. I am conducting a research study at Chautauqua Lake Elementary School and I would like your help in doing so, if possible.

**STUDENT AGREEMENT:** I want to be a part of the research study called Effect of the Metacognitive Think-Aloud Strategy on Reading Comprehension of Kindergarten Students. I understand that Ms. Kristi Bentley from SUNY Fredonia is hoping to help me understand what happens in a story. There are no expected risks in this study and there may be benefits to participating. I understand that I will be part of her group that she reads different stories to. I will listen to the story and answer questions about what happens in the story. I know that my answers will be audio-taped. I will be asked about what happens in the story that she reads to me. This study will take place at my school, Chautauqua Lake Elementary School. This study will begin in February and end in March. Ms. Kristi will be the only one to hear or see my answers to the questions and the information gained and audio-taped will be only available to her.
I am joining the study because I want to. I know that I can stop the study at any time I want. I do not have to answer any questions that I do not want to answer. If I decide to leave the study, it is okay. I will tell Ms. Kristi or my classroom teacher if I want to stop participating in the study. I want to participate in the study!

Name ________________________________

Date ________________________________
Appendix C: Parent Consent Form

PARENT CONSENT FORM

Hi, my name is Kristi Bentley. I teach preschool at Chautauqua Lake Childcare Center. I am currently completing my Master’s degree at SUNY Fredonia. I am conducting a research study at Chautauqua Lake Elementary School and I would like your help in doing so, if possible.

Your child is invited to participate in a research study conducted by Kristi Bentley from the State University of New York at Fredonia. I hope to learn the effectiveness of the metacognitive think-aloud strategy on reading comprehension of kindergarten students.

If you decide to allow your child to participate, he/she will join in on a read-aloud lesson twice a week with me. I will be holding 40-minute reading sessions in the Kindergarten classroom. The study will take place from February 1, 2012 until mid-March, 2012. I will be teaching participants how to use metacognitive strategies to better comprehend a story. Metacognitive strategies allow a student to think about his/her thinking while reading. Specifically, I will teach the Think-Aloud strategy, in which I think out loud as I read a story, modeling the use of metacognition. After I read aloud the story, participants will be individually assessed on their comprehension of the story. Reading sessions and comprehension assessments will be audio-taped to obtain the most accurate data. At the conclusion of the study, the audio-tapes will be destroyed to secure privacy.

There are no anticipated risks involved in the research study. Participants may benefit from the treatment of the study. They may learn how to use strategies in order to understand a text. This skill may help them in their future, making reading an easier task, while they understand the content of the text.

Also, there will be no identifiable information obtained throughout the study. Therefore, your child cannot be traced back to the study by any data collected. Your child’s name will not appear anywhere in the research study. All data collected throughout the study will be secured with myself; no other source will have access to the study results outside of the SUNY Fredonia research team. The data of the study will be kept with myself in a locked secure file. All audio-tapes will be destroyed at the end of the study.
Your child's participation is voluntary. Your decision whether or not to allow your child to participate will not affect you or your child’s relationship with Chautauqua Lake Elementary School. If you decide to allow your child to participate, you and/or your child are free to withdraw your consent and discontinue participation at any time without penalty.

If you have any questions about the study, please feel free to contact me at:

Kristi Bentley  
(814) 823-2993  
Kristi.bentley@fredonia.edu

Jancil C. Rey, Ph.D  
Faculty Sponsor  
(716) 673-4650  
Jancil.rey@fredonia.edu

Maggie Bryan-Peterson  
CRA Director  
(716) 673-3528  
Maggie.bryan-peterson@fredonia.edu

Your signature indicates that you have read and understand the information provided above, that you willingly agree to allow your child to participate, that you and/or your child may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims.

Child’s Name _______________________________________

Signature _______________________________________

Date _______________________________________

## Think Aloud Checklist

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| Predicting | | I predict…  
In the next part I think…  
I think this is… |
| Using Prior Knowledge | | I know this story…  
I have been there before…  
I know that character…  
I knew that before… |
| Personal Response | | I feel…  
My favorite part…  
I liked/disliked… |
| Making Connections  
Personal connections  
Text-to-text connections | | This is like…  
This reminds me of…  
If it were me… |

# Five-Finger Retell Comprehension Assessment

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<td>Middle: The problem of the story is...</td>
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<tr>
<td>Ring: The events of the story are...</td>
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<td>Pinky: The conclusion of the story is...</td>
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Adapted from Reading Rockets (2011) Sharon Taberski’s *All About Comprehension.*
Appendix F: Comprehension Assessment Results

F1 Average Overall Comprehension Score 1

F3 Average Character Score 1

F4 Average Conclusion Score 1
F5 Individual Participant Score 1

Individual Participant Comprehension

- Participant A
- Participant C
- Participant E

F6 Average Setting Score 1

Setting Comprehension

F7 Average Problem Score 1

Problem Comprehension
F8 Average Events Score 1

F9 Participant A Score 1

F10 Participant B Score 1
F11 Participant C Score 1

![Participant C Comprehension](image)

F12 Participant D Score 1

![Participant D Comprehension](image)

F13 Participant E Score 1

![Participant E Comprehension](image)
Appendix G: Think-Aloud Strategy Results

**F2 Use of Think-Aloud Strategy 1**

![Graph showing Use of Think-Aloud Strategy](image)

**T2 Use of Specific Think-Aloud Strategy 1**

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### CITI Collaborative Institutional Training Initiative

**Human Research Curriculum Completion Report**  
Printed on 5/7/2012

**Learner:** Kristi Bentley (username: bentk121)  
**Institution:** SUNY - College at Fredonia

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Department: Curriculum and Instruction  
Phone: 814 823 2993  
Email: bent1948@fredonia.edu

**Group 1:**

**Stage 1. Basic Course Passed on 04/04/11 (Ref # 5855791)**

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<td>Group Harms: Research With Culturally or Medically Vulnerable Groups</td>
<td>04/04/11</td>
<td>3/3 (100%)</td>
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<td>Vulnerable Subjects - Research Involving Workers/Employees</td>
<td>04/04/11</td>
<td>4/4 (100%)</td>
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<td>Conflicts of Interest in Research Involving Human Subjects</td>
<td>04/04/11</td>
<td>2/2 (100%)</td>
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<tr>
<td>SUNY Fredonia State College</td>
<td>04/04/11</td>
<td>no quiz.</td>
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For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.
Appendix I: Human Subjects Review Board Approval

Maggie Bryan-Peterson Maggie.Bryan-Peterson@fredonia.edu

Mar 1

to me, Janeil, Maggie

Ms. Bentley and Dr. Rey --

Thank you for your revised application for your proposed research titled "Effect of Metacognitive Strategy on Reading Comprehension of Kindergarten Students." Your revisions have answered the concerns of the Committee. This e-mail is your approval and your research may proceed as described.

As a reminder, you must comply with Part D of the Campus Policies on Human Subjects requiring notification at the time data collection begins and when it is done. You may accomplish this with a simple e-mail to me.

Thank you for keeping the high standards relating to research and the protection of human subjects on the Fredonia campus. Best wishes on your research.

Maggie Bryan-Peterson
Human Subjects Administrator