

Impact of Drawing in Response to Reading on the Reading Comprehension Skills of Fourth  
Grade Students

by

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Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Education

May 2015

Graduate Programs in Education

Goucher College

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## **Abstract**

The purpose of the study was to determine whether the reading comprehension skill of fourth grade students identified as average readers improves when they sketch in response to reading a text before answering comprehension questions compared to simply reading and responding. A quasi-experimental design was used. The participants in this study were 12 fourth grade students from a public elementary school in Anne Arundel County. Of the 12 students, 6 were males and 6 were females. The Comprehensive Quality Rating Tool and the fourth grade Common Core Informational/Explanatory Text Based Rubric were both used to measure the students' answers to the comprehension questions. The Wilcoxon Signed Rank Test, a non-parametric test, was used to compare median scores obtained under treatment conditions across 10 writing samples with those obtained under control conditions (same 10 writing samples). Median rubric scores were not significantly different under the two different conditions. The hypothesis that the comprehension of fourth grade students prompted to draw in response to reading non-fiction text will not be different from their comprehension without the prompt was not rejected. Recommendations for future research include using students who are below grade level with below level text, to have students draw throughout reading rather than drawing right before answering a question, to further explore the gender differences in this matter, and to explore different genres of text.

# **CHAPTER I**

## **INTRODUCTION**

### **Overview**

Children's literacy skills, their ability to comprehend text and to express ideas, begin to develop even before they enter elementary school. As students progress through the grades, reading and writing skills are essential to learning in every subject, and students who lack these skills are at risk of academic failure. The importance of writing as an essential part of literacy is increasingly recognized. Whereas reading and writing traditionally were taught separately, increasingly they are taught together as part of a literacy block (Teach for America, 2011, p.141).

The role of writing in the development of literacy has been acknowledged increasingly in recent years. Young children begin to write by scribbling and then drawing, and in the primary grades, teachers often encourage children to draw as a part of story writing. By the intermediate grades, however, drawing becomes separated from writing, and the focus in literacy instruction increasingly is upon words.

However, many students beyond the primary grades may still benefit from drawing as a part of writing instruction and literacy development (Mackenzie & Veresov, 2013, p.22). The investigator, who teaches fourth grade, believes that students beyond the primary grades may benefit from teaching strategies involving students in drawing before responding to reading comprehension questions. Further, there is evidence that male students in particular, who tend to lag behind their female peers in reading comprehension, benefit from visual-spatial learning activities in reading (McFann, 2004, para. 3).

### **Statement of the Problem**

The study explores the impact of drawing in response to reading on the reading comprehension skills of fourth grade students.

### **Hypothesis**

The reading comprehension of fourth grade students identified as average readers will be the same whether they sketch in response to reading a non-fiction passage before answering questions about the passage or answer the questions directly after reading the text.

## **Operational Definitions**

Reading comprehension in this study is defined as the ability to read a text and understand its meaning. When students comprehend text they are able to analyze it and think actively so they can make sense of the text's meaning. In this study only non-fiction texts were used. A non-fiction text is based upon facts and true information. The non-fiction texts used in this study were used based on the average level of a fourth grade student, which is the lexile level between 760 and 820, since the participants were average performing fourth grade students in reading comprehension. After reading the non-fiction texts, students are to draw in response to their reading. Sketching in response to reading refers to a student's drawing a picture about the text before answering a comprehension question. Sketching in response to reading refers to student's drawing a picture about the text before answering a comprehension question. After a student reads the non-fiction texts, he or she draws a picture about the text before answering a comprehension question. The comprehension question or reader response question that the students will be answering is an open-ended question about the non-fiction text. The open-ended question requires a written response, rather than one with multiple choices. Once the students answer the reader response question, the two raters will use two different rubrics to grade the answers. The rubrics that are used in this study communicate the expectations for successfully answering the question. The rubrics are a scoring tool that identifies certain criteria that are relevant in the questions. Both rubrics that are used in this study have many different levels of achievement, ranging from a poor score of not answering the question appropriately, to answering the question fully with text evidence to support it. The higher the score, the better the students' response to the comprehension question.

## CHAPTER II

### REVIEW OF THE LITERATURE

This literature review explores the impact drawing has on reading comprehension and writing. Section one provides an overview on how writing is developed over the years. Section two discusses teaching practices and implications teachers use to enhance comprehension and writing through drawing. Section three explores gender differences in academic reading and writing.

#### Writing Development

Writing development starts at a young age. “Success in literacy learning is important in terms of success at school and opportunities in life generally. Writing is a key element of literacy learning. Writing is also one of the important ways humans record ideas, discoveries and stories, and communicate with one another” (Mackenzie & Veresov, 2013, p. 22). There are numerous ways that drawing facilitates the transition to writing. Drawing inspires writers. It allows them to use their imagination and spark ideas, especially when they are stuck. Struggling writers, who are unable to write a complex story using words, might rely on pictures to help write, or even to help comprehend a story they struggle to read. Drawing acts as a transitional alternative for writing capabilities (Christianakis, 2011, p. 27).

Writing begins in forms of scribbles and scribbling facilitates the transition between drawing and writing (Christianakis, 2011, p. 27). “From about age one to two-and-a-half years, children go through a random scribbling stage in which scribbles are primarily a result of the pleasurable physical action of the hand pushing and pulling a crayon or other writing implement across various surfaces” (Baghban, 2007, p. 21). The next stage is called controlled scribbling. In this stage children begin to understand that their marks they make have meaning. They become more aware that the marks they make stand for certain objects and specific people, but may not understand what people or objects they are drawing. The naming scribbling stage occurs next and “is important in children's development of abstract thought because it indicates a shift from a focus on physical control to a clear understanding that the marks made on paper are symbols for real things” (Baghban, 2007, p.22). During the scribbling stages, children begin to distinguish between drawings and writing. This usually occurs between the ages of 2 ½ to 3.



When children begin to understand that their drawings represent real things, they begin to draw and write on the same page. They start to understand that writing and drawing are related. They begin to think that they are both used to represent and communicate feelings and ideas in your mind. By age 3, writings paired with a drawing are known as labels. Children mostly choose to draw objects and people that are meaningful to them, usually pictures of family members or themselves. The labels that match the pictures are usually attempted names of those family members and objects. “Younger children tend to find it easier to draw than to write. The frequent predominance of drawing in development is important because drawing promotes the first writing, and this writing becomes the first reading material that children themselves author. Moreover, practice with labels and captions-at first with adult help-gives children the vocabulary for their written stories” (Baghban, 2007, p.22).

Drawing helps provide students with a helpful scaffold to story writing, especially if children want to express more with their writing rather than just labels and captions. Drawing helps children organize their thinking and their ideas so they are able to write in more complete thoughts (Baghban, 2007, p.23). Drawing before writing a story helps children know what they will write about. “Drawing may serve as a rehearsal for text” (Baghban, 2007, p.23). It helps children gather thoughts and ideas before they write their story. Drawing is motivating for many children, especially when it comes to writing. Pictures help children continue to write when they forget what their story is about because they become focused on mechanics. This means that children can lose their trains of thought if they become too focused on grammar and spelling.

By second grade, or age 7, drawing becomes less necessary and writing becomes increasingly more important. As children get older, they are steered away from drawing pictures, and encouraged to write multiple sentences or even paragraphs. They are to focus on just writing. At this age children are more often encouraged to talk to others about their writing as their rehearsal instead of drawing a picture “The emphasis in many school classrooms is on letters and words, print conventions and accuracy, with limited time for self-expression or text construction through drawing” (Mackenzie & Veresov, 2013, p.22). When children draw before writing it is related to text construction, not to see their artistic capabilities. “Drawing, as a text construction method, should remain available to children throughout the conventional written-language learning journey” (Mackenzie &

Veresov, 2013, p.22). Composing begins with playing and drawing. Research from the 1990's supports a strong relationship between drawing and early writing. Drawing gives children the opportunity to express themselves, which they come to do with written words (Mackenzie & Veresov, 2013, p.23).

Writing is very different in the primary grades than in the intermediate grades. In the primary grades children move through stages of writing in which drawing is present, while in the intermediate grades (grades 3-5) drawing is not present in writing. Drawings are necessary in writing in kindergarten and first grade, but begin to disappear as children go through second grade. When children reach the intermediate grades, drawing is no longer used in classrooms. In these grades, writers gradually gain awareness and control of their writing process, draw on multiple sources of information, and include their own experiences. Children are steered away from drawing pictures to support their text construction.

By age 10, children's writing is much more multi-dimensional. In the intermediate grades, the emphasis on writing is details, thoughts, and conventions, not drawing pictures to express thoughts and support text construction. "This may be a response to the accountability movement, a consequence of a narrow understanding of literacy as reading and writing words or a view of drawing as a time filler, art, or activity to encourage realistic representations of objects, people, places, or events" (Mackenzie & Veresov, 2013, p. 22). Mackenzie and Veresov (2013) suggest that drawing before constructing text is beneficial, even for older students, as it helps with creating ideas for writing. Many older students can use drawing as a brainstorming activity.

Imagery and drawing pictures while reading a text is beneficial to all learners. "A picture is truly worth a thousand words for students who struggle with reading comprehension. We have found that if students can create their own images on the television screens in their minds as they read, their potential for understanding the text is increased. If students are not able to develop images because they are using all their mental energy to decode the words or their personal experiences have limited their vocabulary and background knowledge, external visual images can be used to develop understanding" (Hibbing & Rankin-Erickson, 2003, p. 769). The strategies discussed are all engaging and help teachers gather knowledge about their students regarding comprehension. Mind movies, sketch and stretch, concept and mind mapping, mental imagery, talking

drawings, and learner-generated strategy drawing strategy are tools that will help improve comprehension in all students.

### **Teaching Practices and Instructional Strategies**

In this section, one will find teaching practices and implications teachers use in today's schools to help improve reading comprehension and writing through drawing pictures. These strategies are easy to use and provide teachers with immediate feedback regarding reading and writing.

#### Mind Movies and Sketch and Stretch

Drawing creates a bridge between ideas in a child and the paper on their desk. The use of art and drawing can improve many teachers' existing comprehension lessons and strategies that are already being used in the class. Two strategies used in schools today in particular are mind movies and using a sketch and stretch. These strategies are helpful for improving visualization and comprehension. Visualizing is a skill that is essential for building reading comprehension. We know that when readers lose their mental picture of what is going on in a text, comprehension is lost as well. The mind movie strategy is used during a reading lesson to assist with comprehension. As students read, they create mental images of what is happening in the story as it unfolds, based on what we already know and understand about the world around us. During the story, children draw those mental images to create a movie in their mind (a mind movie). This strategy helps children comprehend what they are reading or what the teacher is reading. Sketch and stretch is an instructional strategy where students draw quick sketches to stretch their thinking and understanding of concepts. Students sketch their picture and stretch their thinking by writing a few sentences to match their picture. This technique can be used in a variety of ways. Teachers can use this strategy to improve skills such as, activating prior knowledge, building vocabulary, making connections, visualizing ideas, identifying main ideas and details, and summarizing and synthesizing information.

The use of art is very beneficial to all students, even students who struggle to communicate by writing. Visualization paired with drawing is something that can help improve children's writing. Drawing allows children to grow from using visual pictures to look at, to using them to speak, and finally to using them in writing (Sidelnick & Svoboda, 2000, p. 174). Teachers often use visualization as a tool to hook a learner into

the lesson or to get them more engaged in reading. “Mental imagery has powerful effects on reading comprehension” (Jurand, 2008, abstract, para. 2). Many teachers use art as a pre-writing strategy. The use of drawing in the writing process allows students who are unwilling or who struggle to write after they draw their ideas (Sidelnick & Svoboda, 2000, p. 182). Teachers must understand the link between seeing, drawing, and writing. “According to cognitively based views of reading comprehension, successful reading comprehension depends on the construction of a coherent meaning-based mental representation of the situation described in a text” (De Koning & Van, 2013, p.2). Although there are teachers who use visualization as a strategy to help with reading comprehension, De Koning and Van (2013) note that they are not used enough in the classroom. Jurand (2008) completed a study that involved mental imagery and drawing while using the writing process. In her study, 19 students (K-4) participated in a summer writing camp. During the camp, the students participated in mini-lessons that inspired the struggling learners to visualize in the writing process. Students used mental imagery and drawing to help them with their writing experiences. Jurand (2008) found that her study provided insight essential to better understand how visualization embedded in the writing process influences struggling learners. She found that writing improved with visualization and drawing.

Struggling learners who have trouble with expressing their knowledge on a topic (writing) benefit from visualization and drawing. Sidelnick and Svoboda (2000) describe the story of an 8-year-old girl named Hannah who struggled with writing. There was an 18-month discrepancy between her physical and mental age. Her strengths were her visual perception skills and her weaknesses were writing and answering questions about reading. Hannah’s resource teacher noticed her love for drawing and that she was very talented at it. After being read a story, Hannah drew a picture to represent it. Her teacher asked her to write about it and she responded with “I can’t” and became frustrated. As she went through the school year, her pictures became more detailed and creative. She was able to explain her story and explain text verbally, but was unable to do so using written words. Hannah was unable to write because she did not know how to write any words. Her pictures helped her teachers know and understand that Hannah understood literature; she just had trouble writing it. Art and drawing as a way for communication for Hannah allowed her to translate her knowledge of content in a different way, still allowing her teacher to see what she learned. All children are different. They come to school

with different cultural influences, different ethnicities, socioeconomic status and racial influences. When teaching, it is ideal that learning strategies should target each student's strengths and their most favorite style of learning. Children are more likely to feel engaged and important when teachers use strategies that acknowledge their strengths and interests, for example, drawing. These strategies will ensure that more students participate in the activities because they are aimed to their strengths and interests. The strategies teachers use in today's school systems should target the children's cognitive strengths and things that they are interested in. When doing this, it will help compensate for the children's weaker areas (Sidelnick & Svoboda, 2000, p.175).

### Concept and Mind Mapping

The use of mapping or concept maps is another strategy and implication teachers use to enhance comprehension. Many of these maps involve drawing. Many researchers suggest that concept maps enhance learning and retention of information. "Of the several reading strategies that are successful, graphic strategies provide readers with visual approaches to reading that are different from traditional, linear text presentations" (Ellozy & Mostafa, 2010, p. 8). Mind mapping is a similar technique as it is a graphical concept. Mind maps are structured around a central idea or word, with sub branches creating related ideas. Both concept maps and mind mapping are strategies that help students visualize ideas and concepts. Both strategies can be adapted, in which teachers can add a drawing piece. Visualization paired with drawing is something that can help improve children's writing skills, as well as concept maps and mind mapping. Jurand (2008) states that writing and drawing can help create a sense of community. Teachers encourage students to draw and write while providing them with immediate feedback. Students are able to choose what to write based from the pervious learning experiences. By doing this, students are adding information to their background knowledge or schema about a specific topic or subject. This helps create a sociolinguistic experience in the classroom. Visualization helps transform readers to become active learners. When a text is difficult to understand, visualization often makes it easier, as they create their own images in their mind and are then able to draw them on paper. These images and drawings they create help readers recall details and draw conclusions about a text, therefore helping their reading comprehension. Many students on today's education system have special needs. Art is a way for these students to express themselves in other ways. They are able to transform what they know and create it in

another modality so they can express their meaning. This also allows teachers other ways of determining if a student understands a piece of text. This strategy can help motivate children who are reluctant or who have specific disabilities. It allows them to learn and write in a new way (Sidelnick & Svoboda, 2000, p. 176).

### Talking Drawings

Talking drawings is a strategy for assisting learners.” (Paquette, Fello & Jalongo, 2007, p. 65). Talking drawings enables children to use prior knowledge, with information from a new text, in order to generate a newly learned skill by drawing and writing labels. Teachers first use talking drawings as a pre-learning strategy. These first drawings give teachers the opportunity to find out what a student might already know about a topic. After the pre-learning drawings, students read or listen to a piece of text on the same topic as their pre-learning drawing. After the reading, students discuss the new information and either change their pre-learning drawing or create a brand new drawing to represent the new information learned from the text. Students are also encouraged to put labels or add captions to their drawings. By comparing students pre-learning drawings to their after-learning drawings, teachers can recognize developments in the student’s learning. Paquette et al., (2007), determined that there are three benefits to using this strategy. First, teachers are able to receive immediate feedback on how a child has performed and developed by comparing the pre-learning drawing compared to the after-learning drawing. Second, teachers can understand the children’s ability to represent ideas using pictures and being able to discuss them with their classmates. “Talking drawings strategy often is more motivating to students than an assignment such as write a paragraph about...” (Paquette et al., 2007, p.66-67). Lastly, this strategy effective if a teacher needs to differentiate instruction. Students come from different background and abilities. This strategy is friendly for all learners, as they all have different capabilities for art. Talking drawings is also great whether or not the children are listening to a text or reading the text themselves. “From a student perspective, talking drawings engages children’s natural inclination to take pencil to paper, thereby using art as a vehicle to express content knowledge. Students can use this strategy to develop higher-level thinking skills through self-reflection and analysis of pre- and post- learning drawings.” (Paquette et al., 2007, p.7).

## Learner-generated Strategy

The learner-generated drawing strategy is one similar to the talking drawings strategy. This strategy is simply just drawing pictures while reading. “A new strategy is asking students to read an article and then draw pictures summarizing the main ideas of what they had read. After summarizing with drawings, students can then answer comprehension questions” (Elliott, 2007, para. 3). Schmeck, Mayer, Opfermann, Pfeiffer, and Leutner (2014) experimented with this strategy with 8<sup>th</sup> grade science students. In this they studied two experiments and looked at the effectiveness of the learner-generated drawing strategy to see if it was effective. They found that the learner generated strategy fostered student engagement and improved comprehension performance.

Drawing is a strategy students can use to help process information learned in school. Drawing allows students to be actively engaged in their learning, rather than being passive and uninvolved. They are a part of the process of organizing and integrating their new information; they are taking ownership in their learning. Drawing can improve learning outcomes, as it is a cognitive learning strategy that helps foster and scaffold learning from texts (Schmeck et al., 2014, para. 3). Schmeck, et al., (2014) found that drawing activities during learning improve performance and that the quality of the drawing during learning from text predicts the student’s performance.

### **Gender Differences in Reading and Writing**

There has been a longstanding debate about gender differences and academic achievement, emotional and social development. Female and male students view themselves differently as readers and writers. Their self-efficacy may be reflected in or reflect their reading and writing capabilities. For example, if a student thinks as him/herself as a poor writer, he/she may not put forth effort in his/her writing in school because he/she already thinks poorly about him/herself on that subject. Besides self-efficacy, studies show that boys struggle more than girls in literacy achievement. A 2004 study by the National Center for Education Statistics provided information regarding gender differences in reading achievement for the 1993-2003 administration of the National Assessment of Education Progress. They found that girls outperformed males in grades four, eight, and twelve on the reading portion of the assessment. In 1998 and 2002 females outperformed males in writing. This trend is continuing. A study done by Learning Resources Network (LERN) looked into the differences in how

boys and girls learn. They found that boys have a shorter attention span than girls and are better at spatially learning new things. They also need more physical activity or movement and need more emotional assurance in school than girls do. They recommend teachers in today's classrooms take these findings into consideration when planning lessons (The Education Alliance, 2007). Many boys are caught in a cycle of reading failure. One possible reason for boys not performing in reading as they should be is that reading comes in conflict with their masculinity. Research suggests that boys between ages 7 and 16 fall into peer pressure about being cool. They are under peer pressure to not be labeled as nerdy or smart. This in turn makes the boys turn against reading. (Brozo, 2010, p. 13). Pajares, Miller and Johnson (1999) investigated the nature of gender differences in writing self-beliefs in students in grades 3, 4, and 5. The knowledge and skills children have and what they do with that knowledge relate to their beliefs about their academic capabilities (Pajares et al., 1999, p.50). This may explain why student performance varies between students when they have similar abilities. Students' self-efficacy plays a prominent role in writing capabilities. "In addition to self-efficacy, these beliefs include writing apprehension that students feel as they attempt writing tasks; how useful they perceive writing to be; the self-regulatory strategies in which they engage; and the feelings of self-worth associated with writing, or writing self-concept" (Pajares et al., 1999, p. 50-51).

Pajares et al., (1999) discovered that students' confidence in themselves is related to their writing competence. They used essay writing as their instrument. The students had 30 minutes to write an essay entitled, "My idea of a perfect day" and was graded by two different raters. They also asked questions to each student using The Writing Self-Efficacy Scale. It consisted of 9 items asking how sure they were that they could perform specific writing skills on a scale from 0 to 100. Writing self- concept was assessed using Marsh's Academic Self Description Questionnaire, which are questions reflecting different academic subjects. The subjects were also evaluated on writing apprehension and writing aptitude. Pajares et al., (1999) found that girls were judged as superior writers, but they found no differences in genders in writing self-efficacy after controlling for writing aptitude. "However, girls expressed that they were better writers than were other boys or girls in their class or in their school to a greater degree than boys did. Only writing self-efficacy beliefs and aptitude predicted writing performance in a path model that included writing apprehension, self-efficacy for



self-regulation, and perceived usefulness of writing” (Pajares et al., 1999, p.50). They also found that writing self-concept was higher in grade 3 than in grade 5.

The tendency for boys to struggle more in literacy than girls has implications for teachers about how to ensure boys succeed in the classroom. The Education Alliance (2007) suggests that teachers provide activities that require the use of visual-spatial strengths. “When teachers use pictures and or graphics more often, boys write with more detail, retain more information, and get better grades on written work across the curriculum.” (Gurian & Stevens, 2010, p. 1). This may suggest that boys will enjoy drawing before answering a comprehension question.

### **Summary**

Literacy is extremely important in the development of children and drawing is a part of learning to write. As children begin their schooling years, they will begin to use drawings to help them write. As they get older, the drawing aspect diminishes and they begin to write more complex text without pictures to help them. Many studies show that using drawings before writing and answering questions about reading is beneficial, yet teachers stop using pictures to help with writing and comprehension early on in the schooling progression instead of adapting activities to include drawing and make them grade appropriate. Many ways exist for teachers to increase comprehension, using drawing. Even with older students, drawing can be beneficial as it gets the mind moving and helps create ideas for writing and helps students remember what they read. The strategies also help teachers gather data and better understand where their children are academically. Drawing while writing especially helps children who are weak writers. It can reduce frustration and they can use drawings to express their knowledge in a new and beneficial way. Using drawings might prove especially helpful for boys who tend to underperform in reading and writing compared to girls. Visualization, paired with drawing, can help improve writing and reading skills of learners of any age.

## **CHAPTER III**

### **METHODS**

The purpose of this study was to determine whether male and female fourth grade students who sketch in response to reading before answering comprehension questions will demonstrate improved comprehension of text compared to their performance without sketching.

#### **Design**

This study used a quasi-experimental design based on repeated measures of students' reading comprehension under both treatment and control conditions. There are no separate treatment and control groups. All participants in this study performed under both the treatment and control conditions and their performance under these conditions was compared. Participants were divided into gender-based groups and each group was assigned to read two non-fiction passages each week, one under the treatment condition (sketching before responding to comprehension questions) and one under the control condition (answering the comprehension questions directly after reading the passage). The ten scores obtained by each participant over the five-week period were summed to yield a total treatment and a total control score for each individual and each group based on 10 sessions. Scores obtained under the treatment condition were compared to scores obtained under the control condition.

#### **Participants**

The participants used for this research were 12 fourth grade students from a public school in Anne Arundel County, Maryland. The sample consisted of 6 males and 6 females. The participants were primarily Caucasian (83%). The other ethnic groups represented were African American (8.5%) and multi-racial (8.5%).

The participants were selected based on their reading levels'. The 12 students are on an average fourth grade reading level and were in the teacher's on level reading group, meaning the students read texts on the lexile level between 760 and 820. All students read non-fiction texts on the fourth grade level.

The school is located in Anne Arundel County in Annapolis, Maryland. The population is very diverse. 60.4% of the students are Caucasian, 27.6% of the students are African American, 5% of the students are

Hispanic, 1.5% of the students are Asian, and 5.5% of the students are multi-racial. Total school enrollment is 556 students. The students represent a wide range of socio-economic status level, from lower to upper middle class.

### **Instruments**

This study used two instruments. Two fourth grade teachers and one fifth grade teacher at the school created the first instrument called the Comprehensive Quality Rating. The Comprehensive Quality Rating is a 3-point rating scale. Scoring a 3 would mean the student answered the comprehension question correctly and provided two pieces of text evidence to support their answer. Scoring a 2 would mean the student answered the question correctly, but only provided one piece of text evidence to support their answer. Scoring a 1 would mean the student answered the question correctly, but did not provide any text evidence to support their answer. Scoring a 0 would mean the student did not answer the question correctly and did not provide text support.

The second instrument used was the fourth grade Common Core Informational/Explanatory Text Based Rubric. There were four sections on the rubric. The sections included focus/information, organization, support/evidence, and language. Because this study did not focus on grammar and sentence structure, only the focus/organization and support/evidence sections on the rubric were used to rate the written examples. This was a 4-point rubric, with scoring a 4 being above grade level, scoring a 3 being at grade level, scoring a 2 being approaching grade level, and scoring a 1 would be below grade level. Each section was worth a total of 4 points, meaning each student received a score out of 8, 8 being the highest.

Both raters used each rubric to grade each student written responses. Each student received two scores from the teacher created rubric each week and two scores from the Common Core rubric each week. The scores were then compared to determine if sketching before answering a comprehension question improved the general understanding of a non-fiction text and if there were any gender differences. The consistency of the rubrics across raters is supported by data showing that all correlations between scores from the two rubrics were statistically significant. Correlations between scores produced by the Comprehensive Quality Rating Tool (CQRT) using a three-point scale, and the Common Core Informational/Explanatory Text-Based Rubric (CCIETBR), a eight-point scale, were uniformly high. For scores under the treatment condition, the correlation

between the CORT and CCETBR ratings was 0.942 ( $p < .000$ ). For the control condition, the correlation was 0.962 ( $p < .000$ ).

### **Procedure**

The 12 participants in this study were all in the on level reading group that met every afternoon for 20-30 minutes Monday through Friday. The students specifically read only non-fiction texts throughout the 5-week period of data collection. Every Tuesday and Thursday the students received a new non-fiction text. The students spent an entire session reading and discussing the text, while the teacher taught them strategies to better understand the text. Strategies included note taking, using post-it notes, highlighting, identifying text structure, posing questions, and using thinking maps (graphic organizers mandated by Anne Arundel County Public Schools). The following day after receiving the new texts, a brief review and discussion about the texts occurred. After the review, the students were asked to answer one brief constructed reading comprehension question. On Wednesday's the girls in the group would sketch before answering the question, while the boys would not sketch, they began writing right away. On Friday the boys in the group would sketch before answering the question, while the girls would not sketch, they began writing right away.

Both raters used two rubrics to grade each student's written responses. One rubric was teacher created, while Common Core mandates the other rubric. From both raters, each student received two scores from the teacher created rubric each week and two scores from the Common Core rubric each week. The scores from both rubrics were then compared to determine if sketching before answering a comprehension question improved the general understanding of a non-fiction text and if males were more affected by the sketching than females. The analyses were performed using the CQRT rubric scores since this is the scoring tool regularly used by the teacher. There were no separate treatment and control groups in this study. All participants in this study performed under both the treatment and control conditions and their performance under these conditions was compared.

## CHAPTER IV

### RESULTS

The purpose of this study was to determine whether male and female fourth grade students who sketch in response to reading before answering comprehension questions would demonstrate improved comprehension of text compared to when those same students simply answered the questions. There were no separate treatment and control groups. All participants in this study performed under both the treatment and control conditions and their performance under these conditions was compared. As Table 1 below indicates, the reading comprehension scores obtained under treatment and control conditions were not significantly different. Therefore, the null hypothesis was not rejected.

Table 1:

Analysis Results of 12 reading responses for treatment and control group

	Treatment	Control	Difference
Participants	12	12	0
Scores	10	10	0
Median Total Rubric Score	10.0	9.75	0.25* (n.s)

The Wilcoxon Signed Rank Test, a non-parametric test, was used to compare median scores obtained under treatment conditions across 10 writing samples with those obtained under control conditions (same 10 writing samples). Median rubric scores were not significantly different suggesting that the hypothesis is not rejected.

The five weeks of scores are each estimates of performance with and without treatment. The sums of the scores were found to produce a total treatment score (reflecting the quality of writing following sketching) and a total control score (reflecting the quality of writing absent sketching). Two raters evaluated each writing sample; when the values they assigned were different, they were averaged. Each student therefore had 10 scores (two per week for each of five weeks). The average rubric scores under the treatment condition were compared with the scores under the control condition using a non-parametric test called the Wilcoxon Signed Rank Test

and used the same test to compare the grade Common Core Informational/Explanatory Text Based Rubric scores. In both cases, the difference between treatment and control median scores was not statistically significant. The null hypothesis is therefore not rejected.

Another non-parametric test, the Mann--Whitney U Test was used to compare and analyze the performance of males and females under treatment and control conditions. Table 2 below describes those results.

Table 2:

Scores for Treatment and Control Students Shown by Group

	Treatment		Control	
	Group 1	Group 2	Group 1	Group 2
Median	10.25	9.25	11.00	8.50
Range	8-14.5	8-12.5	7-14	8-10
N	6	6	6	6

The samples for the Wilcoxon Signed-Rank Test performed on the data for the two groups indicated that the difference between treatment and control median scores was not significant for either males nor females. It is notable, however, that females performed better than males under both treatment and control conditions; males scored better under treatment conditions whereas females performed better under control conditions

The data does not support the hypothesis in that when being compared to themselves, fourth grade students who are prompted to draw a picture before writing in response to a non-fiction text did not demonstrate superior comprehension of the text. The effect for male students was not statistically significant compared to female students.

## CHAPTER V

### DISCUSSION

The purpose of this study was to determine whether fourth grade students' comprehension of text improves when they sketch their understanding of a passage prior to answering comprehension questions about it. All participants in the study performed under both the treatment (reading followed by sketching followed by comprehension questions) and control (reading followed directly by comprehension questions) conditions. Analysis of their reading comprehension did not support the hypothesis that sketching would improve the students' comprehension. There was no significant difference in performance between males and females. However, males' performance was slightly higher under the treatment condition whereas females' performance was slightly lower. Since males often tend to lag behind females in reading skill, this result suggests that further research on the use of sketching to improve comprehension is advisable.

Rubric scores from the Comprehensive Quality Rating Tool were compared from week 1 with the results from week 5. The scores declined very slightly. This could be due to the fact that the students were growing tired of the process and did not exert as much effort towards the end of data collection. None of the differences proved to be significant. The same comparison (week 1 versus week 5) for the treatment and control conditions was compared again, but this time the focus was on females and males separately. Under the treatment condition, girls (median score = 2.75) performed significantly better than the boys (median= 2.00), but only the first week. By the fifth week, boys (median= 2.00) remained constant but girls (median rating= 2.25) had declined so that while girls still were performing better than boys, the difference was no longer statistically significant. Under the control conditions, girls' median score in Week 1 was 3.00 compared to 2.00 for boys. By Week 5, the median ratings for both groups had dropped to 2.00. This is a small sample and small range of possible scores and the findings are not as reliable as they would be in a larger sample, which makes it difficult to achieve statistical significance. More research should be done to study this finding further.

## **Implications**

This study can provide teachers with important data in order to guide instruction. The study supports previous research, in that females are usually better performers on reading and writing tasks than males. This suggests that teachers do not need to provide drawing techniques to the on level females in their classes before they begin a comprehension writing task. This study however, does not provide information about students who are beyond or below their grade level. Drawing before answering a comprehension question about non-fiction texts may or may not benefit beyond or below level fourth grade female students. That information should require further research.

Because the data showed somewhat better scores under the treatment condition for male students, a teacher might use drawing as a comprehension technique. The scores were not statistically significant though, so no guarantees for improved comprehension can be made. Again, just like the female group, this data only provides information about average fourth grade students. Drawing before answering a comprehension question about non-fiction texts may or may not be beneficial for beyond or below level fourth grade male students. That information should require further research.

## **Comparison with Other Research**

Results of this study help support the findings that females perform better on literacy assignments than males. A 2004 study by the National Center for Education Statistics provided information regarding gender differences in reading achievement for the 1993-2003 administration of the National Assessment of Education Progress. They found that girls outperformed males in grades four, eight, and twelve on the reading portion of the assessment. In 1998 and 2002 females outperformed males in writing. This trend is continuing today. This trend proved similar to the findings in the study performed by on level fourth grade students. In the study, the females (Group 1) performed somewhat better than the males (Group 2) in both conditions. Their advantage was particularly strong under the control condition.

A study done by Learning Resources Network (LERN) looked into the differences in how males and females learn. They found that boys have a shorter attention span than girls and are better at spatially learning new things. They also need more physical activity or movement and need more emotional assurance in school



than girls do. In the study conducted, attention span was not taken into account. Graphic organizers and post-it notes were used to organize facts and thinking during reading the non-fiction texts. There were also no movement activities used to process information and knowledge learned in the texts.

Males in the study group did seem to slightly benefit from the treatment (drawing before writing). This is a small sample and small range of possible scores, which makes it difficult to achieve statistical significance. This slight benefit supports other studies done in the past. The Education Alliance (2007) suggests that teachers provide activities that require the use of visual-spatial strengths. “When teachers use pictures and or graphics more often, boys write with more detail, retain more information, and get better grades on written work across the curriculum” (Gurian & Stevens, 2010, p. 1). In the study, both groups used graphic organizers to organize their thinking. The males slightly performed better when they drew a picture before writing, which supports the statements and findings done by The Education Alliance.

### **Threats to Validity**

There are many notable circumstances that may pose a threat to this study’s validity. These threats include the rating instrument, sample size, time period, history, maturation, and reading passages. In regards to internal validity, it is possible there could be issues around the rating instrument because it is teacher created, although it taps into the critical elements of reading comprehension. Another element to consider is the small sample size. Only 12 students were used in the study. Using a larger number of students may provide more data and information. Another element to consider is the short time period in which the data was collected in, although five weeks is good for a real-world type study. More threats to internal validity include history and maturation. Some students in both the control condition and treatment condition were absent on days where a sketch and stretch were given; therefore they had to make up their sketch and stretch and missed instruction, which could pose a threat to the internal historical validity. The treatment was extended over several weeks; therefore something else could have come into play that would affect the scores. During weeks four and five of data collection, many students were tired of doing the sketch and stretches (drawing and answering a question); therefore there could have been a decrease in their motivation, which could also pose a threat to maturation validity. The differences in the passages could also be a factor in threats to validity. Every text was a non-fiction

text on the same reading level, but the students could have responded differently whether they were sketching or not. This could have affected their scores as well.

### **Recommendations for Future Research**

Suggestions for future research include using students who are below grade level with below level text (text on their level), to have students draw throughout reading rather than drawing right before answering a question, to further explore the gender differences, and to explore different genres of text since this study only focused on non-fiction texts.

Students who are above grade level normally perform well on activities consistently; therefore drawing before answering a question would be meaningless. The study that was conducted used students who were on their grade level for reading comprehension, and drawing before answering questions proved to be statistically insignificant. Based on previous research done on the topic, students who are below reading level may benefit from drawing before answering questions. Sidelnick and Svoboda (2000) stated that struggling learners who have trouble with expressing their knowledge on a topic (writing) benefit from visualization and drawing. The use of art is very beneficial to all students, even students who struggle to communicate by writing. Drawing is something that can help improve children's writing. Drawing allows children to grow from using visual pictures to look at, to using them to speak, and finally to using them in writing (Sidelnick & Svoboda, 2000). Based on research conducted by others, conducting a study using below grade level students would be meaningful in finding out if drawing helps improve their comprehension.

Conducting further research on drawing throughout reading could possibly determine interesting outcomes. The study conducted found that when using non-fiction text reading strategies, students needed a chance to stop and process the information during their reading. Graphic organizers and post-it notes were used to do this without drawing. Scheneck et al., (2014) found that drawing activities during learning improve performance and that the quality of the drawing during learning from text predicts the student's performance. Drawing during writing, rather than after reading the entire text, could be beneficial.

The male-female difference in performance patterns is interesting and worth pursuing with a larger group of students. What seems particularly intriguing is that females' performance actually declined when the

treatment was present whereas males' performance improved. The small sample size, of course, does preclude any firm statements about this effect, but it is worth pursuing.

This study only focused on on-level fourth grade non-fiction texts. Using different genres of text could determine different results. Different genres other than non-fiction include, narrative structure such as, realistic fiction, historical fiction, folktales, allegory, drama, and poetry. Best, Floyd, and McNamara (2004) found that when children are confronted with expository texts, such as science texts, their ability to understand what they read is greatly affected by prior knowledge. Thus, just as studies with young adult readers have shown, young children with less prior knowledge will struggle to form a coherent situation model when reading expository texts because they are not able to generate the necessary inferences (Best et al., 2004, p.5). This study was based on reading level, not prior knowledge, which could have had an effect on my outcome. Because of this, using a different genre may prove more beneficial.

### **Summary**

The purpose of this study was to determine whether male and female fourth grade students who sketch in response to reading before answering comprehension questions would demonstrate improved comprehension of text compared to when those same students simply answered the questions. There were no separate treatment and control groups. All participants in this study performed under both the treatment and control conditions and their performance under these conditions was compared. The differences between the treatment and control median scores was not statistically different, therefore the hypothesis was not rejected. Fourth grade students who were asked to draw a picture before responding to a comprehension question did not demonstrate superior comprehension of the text compared to when they did not draw before responding to the comprehension question. The difference between the treatment and control median scores was not significant for males or females. Males, however, did perform slightly better in the treatment condition when compared to themselves. This finding suggests that future research on the gender differences in this matter is advisable.

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