The Effects of Thinking Map Instruction on Written Responses to Writing

Prompts for Fifth Graders with Specific Learning Disabilities

By Kimberly Pickett

Submitted in Partial Fulfillment of the Requirements for the

Degree of Master of Education

July 2015

Graduate Programs in Education

Goucher College

Table of Contents

List of Tables

Abstract

The purpose of this study was to investigate whether thinking map instruction and the opportunities for students to use thinking maps would have a significant effect on the written responses to informational/explanatory writing prompts of three fifth graders with Specific Learning Disabilities. Explicit thinking map instruction was provided, along with instruction on analyzing writing prompts and paragraph development. A ten-point writing rubric was used to measure students' use of one or more thinking maps and the inclusion of specific paragraph components (an introduction, body, linking words, and conclusion) for each writing sample. Writing rubric scores were collected from writing samples given before, during, and after instruction using a pretest/posttest design. Results indicated slight increases in total writing scores, but no significant differences were attributed to the use of thinking maps.

CHAPTER I

INTRODUCTION

Overview

Why is Writing Important?

Writing is important to many aspects of life. Students need effective writing skills to excel in school; and increasingly, employers prefer to hire and promote salaried workers with excellent writing skills (National Commission on Writing, 2004). In order for Americans to compete in a global economy, educational reforms such as the Common Core State Standards have campaigned to improve writing instruction for all students. These standards aim to prepare students to become competent writers who have the power to logically and reasonably explain, inform, and persuade others. Without common goals and effective instruction, students are at risk for lower grades, wages, and self-reflection.

What are the Consequences for Poor Writing?

Poor writing skills impact academic achievement and professional growth as well as emotional and social development. Deane (2011) examined several connections that link writing with reading, critical thinking, and social contexts. Since writing is interrelated with other cognitive and social facets of functional life, poor writers may be perceived by peers and adults as less competent. Such harmful views may unfairly limit opportunities that they may otherwise be eligible for. This is especially true for students with Specific Learning Disabilities.

Challenges to Students with Specific Learning Disabilities

Students with Specific Learning Disabilities (SLD) have metacognitive deficits that make

written expression a monumental task. For example, difficulties with retaining information, grasping abstract concepts, identifying relationships among ideas, and following multi-step procedures across subject areas all present learning challenges that are further seen in writing performance. These students lack organizational and study skills (Deshler, Ellis, & Lenz, 1995) as well as the ability to recognize that effective writing is a process of multiple stages, each with its own distinctive set of skills and characteristics. In addition to having difficulty producing clear and cohesive writing content, many tend to struggle with writing conventions and handwriting. Shortfalls in both areas highlight the need for early interventions to improve writing.

Interventions to Improve Writing in Elementary Students with Disabilities

Efforts to improve students' writing development start as early as the elementary level. More explicit instruction and think alouds during the writing process are required for students with disabilities. Graham, McKeown, Kiuhara, and Harris (2012b) identified several effective practices that address the metacognitive demands of writing content and conventions. Added benefits may also be found when these practices are used together (Sadoski, Willson, & Norton, 1997). In particular, strategies that promote mental imagery, peer collaboration, and planning are essential before drafting even begins. The use of graphic and visual organizers can serve as a practical organizational tool for students to anchor a topic and incorporate its relevant details.

Thinking Maps

Unlike graphic organizers that are usually text or teacher-centered and based on isolated tasks, thinking maps are student-centered for cooperative learning and based on fundamental thinking skills (Hyerle & Yeager, 2007). For students with learning disabilities, associating

concrete visual patterns to specific cognitive skills supports research findings of effective instructional practices. Furthermore, the collaborative discussion that takes place when students brainstorm, describe, compare and contrast, sequence and order, classify, identify part-to-whole relationships, see analogies, and analyze causes and effects reinforces the tenets of higher level skills needed for critical thinking.

Statement of the Problem

What effect does thinking map instruction and opportunities for students to use thinking maps have on the written responses to writing prompts for fifth graders with Specific Learning Disabilities?

Hypothesis

After thinking map instruction and opportunities for students to use thinking maps, there will be no difference in the written responses to writing prompts for fifth graders with Specific Learning Disabilities.

Operational Definitions

Thinking maps are eight visual patterns that are based on different fundamental thinking processes: circle map (brainstorming), bubble map (describing), double bubble (comparing/contrasting), tree map (classifying), flow map (sequencing), multi-flow map (analyzing cause/effect), brace map (identifying part-whole relationships), and bridge map (seeing analogies). These tools can be used individually or in combination across every grade level and content area to support the learning process.

Opportunity to use thinking maps refers to the number of thinking maps students used prior to writing.

The writing score is defined as the total rubric score based on evidence of writing content standards (topic sentence, supporting details, concluding sentence).

A rubric is a scoring tool with performance descriptors and corresponding point values based on the criteria of writing content standards (i.e., topic sentence, supporting details, concluding sentence).

A Specific Learning Disability (SLD) refers to a disorder in one or more of the basic psychological processes involved in understanding language, spoken or written, which impacts one's ability to listen, think, speak, read, write, spell, or do mathematical calculations (AACPS eHandbook for Special Education, 2013).

CHAPTER II

REVIEW OF THE LITERATURE

In recent years, there has been a pivotal shift in the demands and expectations of educators and students, particularly in the areas of writing instruction and writing performance. Trends in National Association of Educational Progress (NAEP) data show high percentages of performance at or below Basic level for students assessed at grades 4, 8, and 12 (National Center for Educational Statistics, 2002). Studies (Graham, 2006b; Graham, Berninger, & Fan, 2007; Knudson, 1995) relating writing attitudes among elementary students with writing achievement have brought more attention to the importance of preparing elementary students, especially those with learning disabilities, for the complex writing expectations of school and daily life. As asserted by Miller (2000), American workers in most settings will most likely write more compared to previous workers. Those individuals who continue to have poor writing skills into adulthood are at risk of earning lower salaries than those with strong writing skills.

The purpose of this literature review is to discuss the significance of writing in our schools and society. It will provide an overview of Common Core State Standards and describe its writing standards. The review will discuss writing assessments and national results of students' writing performance. Finally, it will highlight characteristics of students with learning disabilities and present effective instructional strategies.

Importance of Writing

Writing is an important skill that impacts the lives of children and adults. Writing competence can be viewed as a skill that develops with high-quality instruction and feedback, meaningful practice opportunities, and time. Writing skills are significant for elementary students' sustained learning in all of the academic sectors, as well as self-expression and

communication (Graham et al., 2012a). Early acquisition of these skills can result in better communication in school, work, and social settings.

Academic Growth

The ultimate goal of reading is to use a variety of strategies to construct meaning from what is read. As early as kindergarten, students are taught to develop reading comprehension skills, which are simultaneously reinforced in other subject areas. According to Deane (2011), there is a mutual relationship between reading, writing, and critical thinking. He asserts that "the skills that are most important for reading play a supporting role in writing competency; but conversely, skills that are critical for writing play supporting roles in enhancing reading comprehension" (Deane, 2011, p. 12).

During the writing process, students need to have knowledge about a topic in order to plan and organize their ideas. Identifying what information to include and considering ways to present relationships between the concepts in a logical order is another example of critical thinking skills that are revealed in writing samples (Deane, 2011). Students must also revise and edit their drafts to ensure that their writing precisely communicates their original thoughts to others. This requires careful selection of word choice and sentence structure that is dependent on the intended reader. Such reflective mental processes during the stages of writing stem from conceptual thinking (Deane, 2011). Application of these higher level skills provides students with limitless opportunities to communicate their knowledge and understanding for various writing purposes using various writing texts, and thus show academic growth.

Emotional and Social Development

Reflective and creative writing exercises tend to build appreciation and confidence for writing. Calkins (1994) shows that through personal and journal story writing, students can

discover their initial identities and effort through real-life issues. According to Wong (2004), when parents separate, children might find writing a therapeutic channel to cope. Because writing requires the student to reflect on purpose and audience, for instance, practice may assist the student in applying similar considerations to some verbal communications. The process of writing, including feedback and peer review, enables students to gain knowledge from one another. Developing these skills at a young age teaches students to both deliver and accept constructive criticism. Additionally, collaborative writing projects, like forming a class newspaper, allow students to jointly attain writing goals (Monroe, 2003).

Technology

As students progress through school in the 21st century, they gain academic knowledge and require computer literacy to be successful. While these two skills balance one another, computer software equipped with grammar and spelling tools may limit the development of writing skills for some students. According to Monroe (2003), students who rely on typing are not capable of practicing handwriting. However, the National Commission on Writing (2003) views such software as an enhancement to writing because it engages students in the learning process and motivates them to create and share their writing. Moreover, with the rapid expansion and availability of computers and mobile devices with internet access, traditional methods of written communication are increasingly shifting to electronic methods.

Profession and Credibility

Research has proven that writing is essential to employers. According to 2004 survey results from the National Commission on Writing, major American corporations view writing as "a 'ticket to professional opportunity' and a 'threshold skill' for hiring and promotion among salaried (i.e., professional) employees" (p. 5). Two-thirds of salaried employees in large

American companies have some writing responsibility, and certain writing skills are considered desirable, such as accuracy, clarity, and proper usage (National Commission on Writing, 2004). Research has shown that most individuals spend a large amount of time at work communicating in writing. Whether writing in the workplace consists of informal correspondences with colleagues or formal letters and reports with supervisors, one's writing skills have the potential to either boost or inhibit one's career easily.

An individual's writing skills may influence how he or she is perceived by others. Graham and Harris (2005) suggest that individuals with optimal writing skills are usually seen as being more credible. He asserts that it is usually hard to interpret emails from people that include grammatical errors and typos. At best, he shows that they are generally negligent in that they do not proofread their messages or utilize spell checks. At worst, they present themselves as less capable and unintelligent. Optimal writers tend to attain higher grades and are perceived as being highly capable and intelligent than less literate individuals. Therefore, professional writing, like school writing, involves not only presenting relevant information in an organized and coherent manner, but also proofreading and revising it to ensure appropriate grammatical and language usage for its intended audience.

Common Core State Standards

Overview

Common Core State Standards (CCSS) were developed with input and research from many sources, including educators, state departments of education, professional organizations, assessment developers, students and parents, and the general public (Common Core State Initiative, Development Process, 2015). Simply put, states that have adopted the CCSS have agreed to follow the same framework of content-specific skills for students in grades K-12. The

main goal of these standards is to inform and improve student achievement with the focus of providing students with the skills needed to become college and career-ready in the 21st century. Through a common set of learning objectives, the wide variance of what skills are to be taught from state to state is eliminated, and the relevancy, rigor and depth of common skills is increased. This framework is not a prescription for the way standards ought to be taught or the materials to be utilized in supporting students (Common Core State Initiative, Myths vs. Facts, 2015). On the contrary, this framework allows teachers to use an array of approved curriculum materials and some level of flexibility in determining the amount of time to teach the standards (Common Core State Initiative, Development Process, 2015). This, in turn, gives students flexibility in the time needed to master them (Common Core State Initiative, Development Process, 2015). Individual school districts and states have identified a scope of supports necessary for all students, particularly English language learners and those with special needs, to master these standards (Common Core State Standards Initiative, 2014). Content-specific standards are meant to progress in a staircase of mastery and are assessed annually by one of two assessment consortia: Partnership for Assessment of Readiness for College and Careers (PARCC) or Smarter Balanced Assessment. Foundational skills and concepts are emphasized in primary grades, and more complex application of these skills across content areas is expected in intermediate and secondary grades. Although there is no set of these grade-specific standards that can wholly reflect on the huge variety of abilities, requirements, learning rates, and attainment levels of students in any specific classroom, the standards offer clear signposts alongside the purpose of college and career readiness for every student.

Writing Standards

Across grade levels, writing standards lie w/ithin the English/Language Arts Standards

but are intended to be applied in all subject areas. They set the requirements for students to compose informative, narrative, and argumentative writing that are based on sound logic and appropriate evidence (Common Core State Standards Initiative, Key Shifts in English Language Arts, 2015). These standards also require students to revise their writing to reflect their expanding vocabulary and increasingly sophisticated grammatical and language usage (Common Core State Standards Initiative, Key Shifts in English Language Arts, 2015). The writing standards enhance several of the standards for reading informational and literary text. For example, they expect students to integrate information from several texts on the same topic, explain the relationships or interactions between two or more concepts, and compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, and problem/solution) of events. More importantly, these standards give students the chance to apply the skills and knowledge of the writing process in ways that mimic real-life application and deepen their understanding of content.

<div align="center">**Writing Assessments**</div>

Informal Assessments

According to the Conference on College Composition and Communication (CCCC) (2014), writing assessment can be used for multiple purposes both inside the classroom and outside, but its most important function is to improve teaching and student learning. Informal assessments enable teachers to monitor the ongoing writing development of students with greater reliability than standardized tests. While standardized tests tend to measure students at specific points annually in comparison to peers, ongoing informal assessments offer continual snapshots of student progress throughout the school year. Rubrics are a common tool that teachers use to measure the specific genres or situation-specific criteria. Rubric descriptions and points are

assigned based on the degree of text-specific features observed in the writing sample. These

criteria are often linked to standards-based expectations, so the key components of each text type

are already known. For instance, key components of informational writing pieces may evaluate

its structural organization (i.e., introduction, body, closing), degree of clarity and coherence, and

inclusion of relevant supportive details and evidence. However, many teachers opt to

supplement the rubric scoring guide with more specific criteria that students can reference as a

checklist (e.g., topic sentence, supporting details, and conclusion sentence) (Enz & Serafini,

1995). Similar to the process of creating scoring guides and checklists for writing content,

rubrics typically rate writing conventions, too (Enz & Serafini, 1995). Writing conventions

include the appropriate use of language, spelling, capitalization, punctuation, and handwriting.

By utilizing informal assessments, teachers are able to target students' exact problem areas,

acclimatize instruction, and arbitrate earlier instead of later (Kuzmanovic & Cuevas, 2009).

PARCC Performance Level Descriptors

During the English/Language Arts portion of the PARCC assessment, students in grades

3-11 are expected to complete a Prose Constructed Response (PCR) or writing task. According

to Fare (2014), the PARCC performance level descriptors tend to be written for two assessment

assertions of writing and reading. With the writing claim, the performance level descriptors tend

to be written for two additional sub-claims: (1) written expression and (2) knowledge of

conventions and language. Specific factors differentiate each level of writing performance. At

the highest level of performance, students demonstrate consistency in developing ideas from one

or more sources with particular attention to structural organization. In addition, students'

command of grammar and language usage is also evaluated against grade level standards.

Teachers might elect to utilize the PCR rubrics within their classrooms to provide feedback to

students or to talk about best practices within their professional learning environments (Fare, 2014). Along with Fare's suggestion to use the PCR rubrics as a teaching tool for students, it may also be advantageous to present students with performance tasks modeled after sample PARCC assessment items to increase familiarity with question format and text complexity.

National Writing Results

National Association of Educational Progress (NAEP) assessments for 4th grade writing did not occur between 2003 and 2011. This time period coincides with ground-breaking studies conducted by the National Commission on Writing (2003 & 2004), as well as educational reforms that brought forth the Common Core Standards (National Governors Association Center for Best Practices, 2010).

A 2012 usability study conducted by the National Center for Education Statistics (NCES) required 4th graders to compose computer-based written responses that convey an experience, persuade, and explain. 39% and 44% of students were given either two 30-minute or three 20-minute assessments respectively. Student responses that were categorized as showing little to marginal writing skills earned one or two rubric points. Responses that earned three or four rubric points represented developing or adequate writing skills and scored 47% and 6% respectively. Only 14% of student responses earned five or six rubric points, which demonstrated competent or effective writing skills when given two 30-minute tests. Further, the performance of each writing task shows relatively fewer student responses that earned one or two rubric points for conveying an experience (36%), persuading (48%), and entertaining (36%). The average word count for responses that received a score of six was 231, while the average word count of responses that received a one was 56.

Although the author of this study advises users to interpret these findings with caution, the higher percentages of low rubric scores and average word counts are consistent with other studies that measure similar areas of writing performance. These results indicate that half or more of the students did not meet criteria as competent or effective writers, which warrants further investigation. Quite possibly, students did not receive adequate writing instruction at the time the test was given, or the instructional activities and curriculum were not aligned with the writing standards that were assessed. In either scenario, teachers can benefit from these findings by conducting an item analysis of the lowest rubric scores in order to inform their instruction.

In addition, a comparison of writing results reported by NAEP shows slight percentage point increases in the achievement levels of students at or below Basic in 1998 to achievement levels at or above proficient in 2002 across 4th, 8th, and 12th grade (National Center for Education Statistics, 2002). Although these increases appear positive on the surface, 69% or more of these students remain at or below basic level proficiency.

It is important to note that NAEP does not report achievement level results for disability and English Language Learner populations. However, specific information about their participation or exclusion in assessments is available within the NAEP Writing Report Card. Overall, these trends send a signal to stakeholders to examine and improve current instructional practices and implement research-based strategies, especially for struggling writers and students with disabilities.

Characteristics of Students with Learning Disabilities

Struggling writers and students with learning disabilities (LD) are at risk for academic failure and limited career opportunities. Dexter and Hughes (2011) discuss several challenges that LD students face including difficulty with basic academic skills (e.g., reading), as well as

organizational and study skills (Deshler et al., 1995). They also have difficulty applying

strategies to self-regulate, monitor their thinking, and comprehend basic and higher-level

concepts (Baumann, 1984; Holmes, 1985; Johnson, Graham, & Harris, 1997; Kim, Vaughn,

Wanzek, & Wei, 2004; Williams, 1993). LD students lack metacognition skills that are required

to perform tasks with multiple steps. In addition, metacognitive weaknesses may also impact the

ability to recognize and generalize different structural writing patterns that exist in different

types of writing seen across content areas. These students benefit from explicit instruction and

modeling to grasp such abstract concepts, and incorporating the use of graphic and visual

organizers can support learners in making the abstract task of written expression more concrete.

An important, but sometimes overlooked, phenomenon is the link between motivation

and performance. In the case of writing, Knudson (1995) found that grade level, gender, and

writing attitude are related to writing achievement in primary grades. Older elementary girls that

have positive attitudes toward writing tend to perform above-average on writing tasks when

compared to younger boys (Knudson, 1995). Deliberately fostering positive attitudes by

providing specific feedback of writing strengths and weaknesses and by sharing student work

during the stages of writing instruction and development may support overall attitudes toward

writing.

Effective Instructional Practices

Effective writing instruction benefits all students. All students must learn the forms and

purposes of writing, fundamental writing skills, and strategies for planning and evaluating their

work. Personal motivation is just as important. According to an article by Wong (2004), the

purpose of good writing instruction for students with specific disabilities is similar to that of

every student. Struggling writers require more support and explicit modeling of specific strategies and skills.

A meta-analysis conducted by Graham et al. (2012b) identified twelve effective instructional practices that improve the writing performance of elementary grade students: 1) teach students strategies for planning, drafting, or revising different types of text; 2) teach students procedures for regulating the writing strategies they are taught; 3) teach students how to form mental images and be more creative; 4) teach students different types of text structures; 5) teach students spelling, handwriting, and keyboarding; 6) create opportunities for students to work collaboratively to plan, draft, revise, and edit their papers; 7) set clear and specific goals (e.g., add three new ideas when revising) for what students are to accomplish when writing; 8) engage students in activities that help them gather and organize ideas before they write a first draft; 9) assess students' writing and their progress in learning to write with adult and peer feedback; 10) use word processing as a primary tool for writing; 11) increase the amount of time students write; and 12) implement a comprehensive writing program. Researchers found preliminary evidence to support the likely benefits of combining different instructional practices (Sadoski et al., 1997).

Sundeen (2007) discusses an effective set of graphic organizers that aid in explicitly teaching students with learning and behavioral issues the planning and drafting stages of the writing process. Verbalizing each step of the metacognitive process is important in strengthening students' awareness of the thinking associated with the writing process. The graphic organizers, appropriately named Pre-Writing Planner and Rough Draft Planner, are designed to help students visualize complex concepts when they brainstorm and categorize ideas. This preliminary step is further scaffolded through the use of color-coded bubbles that highlight

Three Big Ideas, which are later transferred to the Rough Draft Planner for further elaboration. The Rough Draft Planner helps students organize those color-coded ideas into a draft format of an essay consisting of an introduction, three body paragraphs of main ideas and supporting details, and a conclusion, which are required by the Common Core anchor standards for all three text types of writing. Sundeen explains the value of having students work together with teacher support to brainstorm, discover patterns of similarities among ideas, and group-related ideas, and encourages the gradual release of teacher support when students master the planning and organizational stages of writing essays.

Visual organizers such as thinking maps may provide even more conceptual understanding to students with learning disabilities. These maps align with CCSS and consist of eight visual patterns that are based on specific thought processes: brainstorming and defining in context, describing with adjectives, comparing and contrasting, classifying and grouping, identifying part to whole relationships, sequencing and ordering, analyzing causes and effects, and seeing analogies (Buckner, 2012). According to the thinking maps training manual, the Circle Map (brainstorming), Bubble Map (describing), and Bridge Map (seeing analogies) help students gather ideas, increase descriptive language use, and aid students in visualizing relationships between concepts during the planning stage of the writing process (Buckner, 2012). The Tree Map (classifying), Double Bubble Map (compare and contrast), Flow Map (sequence), and Multi-Flow Map (cause and effect) help students organize information as they begin to write sentences (Buckner, 2012). Thinking maps are designed to allow students to actively engage in learning activities and turn abstract ideas into more concrete ones for visual learners. When used regularly, these organizers also serve as meaningful note-taking devices, study guides, and planning organizers for writing across all content areas.

Additionally, writing for authentic purposes makes the writing far more pleasant and meaningful for students. Furthermore, it aids students with understanding the reasons behind the various forms of writing. For instance, students learn that persuasive writing requires considering the possible counterarguments (Wong, 2004). In addition to writing for particular audiences, writing can be enriched when it is merged with other areas of the curriculum. For example, when students create posters that display facts and details about people or events, write plays that tell a story with a problem and solution, or publish book reviews for classmates, they have the opportunity to synthesize information learned in other subject areas. When shared with other individuals, they offer a model for the communication of a learning community. This is a significant application of writing within the adult world.

Summary

With the inception of Common Core State Standards, the need for adequate writing skills for all is now at the forefront of educational and corporate agendas. This urgency is especially true for populations that already struggle to close achievement gaps. Lack of writing skills impacts all facets of society. Therefore, states have developed rubrics and writing assessments to further improve student writing skills. It is generally presumed that being capable of writing and reading affects the daily lives of students and adults in numerous ways. In fact, it affects the way they think, their earning potential and career progress, and their ability to fit into social circles and their environment. The above studies have shown that teachers' implementation of effective instructional practices and adult involvement are the prerequisites for increasing the chances of our nation improving our literacy skills in preparation for future opportunities.

CHAPTER III

METHODS

The purpose of this study was to investigate whether thinking map instruction and the opportunities for students to use thinking maps would have an effect on the written responses to writing prompts for fifth graders with Specific Learning Disabilities.

Subjects

The subjects of this study were three fifth grade students identified with Specific Learning Disabilities. The participants consisted of one Caucasian male, one African-American male, and one African-American female. Each student had an Individualized Education Plan (IEP) with specific goals and objectives related to reading and written expression. The female student also had goals and objectives for math. Instruction was provided in a general education setting for more than 80% of the school day. All three subjects had instructional and testing accommodations that allowed verbatim reading of text, scribe (dictated responses written by an adult), or periodic access to a word processing device with word prediction or spell check features for longer written assignments. These students were performing on a first to third grade level in reading, writing, and math, and received special education services both inside and outside of their regular classes.

These students attended a public elementary school located in a suburban area of Anne Arundel County, Maryland. During the 2014-2015 school year, the enrollment was 409 students in grades PreK-5 and 13 students with special needs in a half-day PreK program. The overall student population was 52% male and 48% female with the following ethnic representation: 6% Asian, 26% African American, 11% Hispanic, 48% White, with the remaining 9% being two or more races. There were 40.5% of students categorized as eligible for free and reduced meals,

5% or less had limited English proficiency, and 12.3% received special education services. In 2014, students in grades three through five took the Maryland School Assessment (MSA) to measure academic progress in reading and math. Fifth graders also took a science assessment. Proficient and advanced scores reported for each grade level and subject area were as follows: third graders achieved 76.1% math and 72.7% reading; fourth graders achieved 90.2% math and 88.5% reading; and fifth graders achieved 81.5% math, 92.6% reading, and 74.1% science.

The subjects for this study were selected based on similar IEP goals for written expression. Specifically, their goals were to use visual organizers such as thinking maps to create at least multiple paragraphs in response to a written prompt that includes a topic sentence, supporting details, and a concluding sentence. Their performance on informal writing assessments consistently lacked one or more of these criteria, and their rubric scores fell at or below five on a ten-point scale. Although the participants had knowledge of the function of each thinking map, they did not regularly use them to plan and organize their ideas before writing.

Instrument

In order to measure each student's writing progress, three writing samples were collected before, during, and after thinking map instruction. The samples were scored based on the use of a thinking map(s) and four writing content standards. Each prompt required students to create a thinking map to organize their ideas before writing an informative/explanatory piece. The rubric is attached in Appendix A.

Procedures

Students worked with the special educator outside the general education setting for 30 minutes, four to five days per week to address reading and writing IEP goals. For a period of eight weeks, the weekly instructional routine involved spending the first two days introducing a

decoding strategy, comprehension skill, and story vocabulary with teacher modeling and cooperative student activities. Days three and four were reserved for guided reading, application of comprehension skills using thinking maps, and answering questions about the story. On the last day, students responded to the writing prompt.

At the end of first week, students were given 30 minutes to complete the pre-assessment. The prompt asked students to "Explain some ways to keep pets safe." The prompt also instructed them to "Make a thinking map to help organize your ideas." Students had access to blank paper for planning, a personalized spelling word list, a list of transitional words and phrases, and the reading book. All students completed the task within the allotted time, and the sample was scored according to the five descriptors of the writing rubric.

Over the next three weeks, students followed the same instructional routines described above. However, during days four and five, the Special Educator spent 15-20 minutes on explicit instruction that focused on two important prerequisite components needed before writing: 1) ensure students understood the demands of the prompt (i.e., explain to report elements of descriptive information, explain how, or explain why); and 2) use the appropriate thinking map(s) that models that thinking process. A chart of all eight thinking maps is attached in Appendix B. To achieve this, the Special Educator presented students with three different writing prompts that met each informational/explanatory demand. The first prompt required students to reread an article about Deborah Sampson and Marie Curie. Then, "Explain *why* Deborah Sampson or Marie Curie was important to American history." Through modeling, rich discussion, and verbalizations of the teacher's thinking, key words from the prompt ("why," "Deborah" or "Marie," "important," and "American history") were identified to reveal that two thinking processes occurred for this task. As a result, a tree map would be appropriate for

categorizing each woman's accomplishments. Equally appropriate would be the use of a multi-flow map to show the historical effects of each one's respective actions. Students copied details from the teacher's thinking map models into their notebooks.

The same procedures for identifying key words in the writing prompt and selecting an appropriate thinking map(s) were followed for the two remaining prompts. One prompt required students to "Explain *how* the planet Mars is different from Earth." The group identified the words "how," "Mars," "different," and "Earth." They selected a double bubble map based on the comparing/contrasting thinking process and recorded the example in their notebooks. The teacher had students use two different colors to distinguish similarities from differences.

The third prompt asked students to "Explain the qualities of a good teacher." The group identified the words "qualities," "good," and "teacher." With less teacher support, they chose a circle map to list random words and phrases that they associated with good teachers. Some of the words they brainstormed were: "nice," "teaches kids different subjects," "helps kids learn," "grades papers," "deals with student behavior," "organized," "calls parents," and "likes kids." Next, the teacher focused the students' attention on grouping similar concepts into different descriptive categories. For example, "caring" described a teacher who was nice and liked kids; "smart" described a teacher who taught kids different subjects and helped kids learn; "responsive" described a teacher who dealt with student behavior and contacted parents; and "hardworking" described a teacher who graded papers, was organized, and planned lessons. The process of grouping and labeling similar concepts into categories called for more teacher input and group discussion to come up with a single adjective. Once completed, the descriptive qualities of a good teacher were listed on a bubble map, and copies of the class notes were given to students.

The second phase of thinking map instruction focused on transferring ideas from the organizers into a rough draft. First, students were given a copy of the informative/explanatory writing rubric to review the three elements of a paragraph. Using the completed thinking maps from each prompt, the teacher modeled how to create a topic sentence. In the case of the first prompt, the teacher wrote two topic sentences, one that used some key words and one that used no key words. For the second prompt, the students worked together to create a topic sentence that used some key words that were previously identified. The teacher provided feedback, and the topic sentence was written on blank chart paper for students to refer to during independent practice. Students were instructed to create a topic sentence for the final prompt independently. The teacher met with each student individually to provide feedback.

Next, students reviewed the rubric criteria for the body of a paragraph. To model this skill, the teacher read aloud the facts listed for each person. Based on the recorded notes, there were three facts and details listed for Marie Curie so the teacher verbalized this as the reason for selecting her as the important person. Then the teacher referred to a class chart of transitional words and phrases for which students also had individual copies. The teacher chose transitional words and phrases such as "one reason," "also," and "most importantly" to link each reason with an example of text evidence from the article. Again, the teacher verbalized the thinking process that accompanied the word choice, grammar usage, and writing conventions of each sentence. Students worked together to develop supporting sentences for the second prompt. The teacher assigned three roles for this task: 1) Sentence Developer (created one sentence for the reason and cited an example from the text); 2) Transitional Word Picker (selected an appropriate transition word or phrase from the chart); and 3) Sentence Writer (wrote the sentence on a dry-erase board). Since there were three reasons listed on the tree map, the roles were rotated to allow

each student the opportunity to practice developing a sentence, picking transition words, and writing sentences. Teacher feedback was given after each rotation, and the final sentences were transcribed onto the same chart paper in a different color for future reference during independent practice.

Finally, students were taught to develop a concluding statement based on key words from the writing prompt and information that they presented. The teacher modeled and verbalized how to paraphrase words from the prompt and make an inference about information from the tree map. Students were encouraged to create similar concluding statements using the teacher's example as a model. The conclusion was added to the chart in a new color for students to refer to during independent practice.

At the end of the instructional period, students were given 30 minutes to complete a mid-point assessment. The prompt asked students to "Explain how the planet would change if all the trees were cut down." The prompt also instructed them to "Make a thinking map to help organize your ideas." Students had access to blank paper for planning, a personalized spelling word list, a list of transitional words and phrases, and the reading book. All students completed the task within the allotted time, and the sample was scored according to the five descriptors of the writing rubric.

At the end of the eighth week, students were given 30 minutes to complete the post-assessment. The prompt asked students to "Write a memoir about a special person in your family in celebration of Grandparents' Day." The prompt also instructed them to "Make a thinking map to help organize your ideas." Students had access to blank paper for planning, a personalized spelling word list, and a list of transitional words and phrases. All students

completed the task within the allotted time, and the samples were scored according to the five

descriptors of the writing rubric.

RESULTS

The purpose of this study was to examine the effects of thinking map instruction and opportunities for students to use thinking maps on the written responses to writing prompts for fifth graders with Specific Learning Disabilities.

The results of pre- and posttest informative/explanatory writing rubric scores for three fifth grade students with Specific Learning Disabilities after instruction using thinking maps were analyzed using a t-test for paired subjects. The results are represented in Table 1 below.

Table 1

Pre- and Posttest Writing Rubric Results for Students with Specific Learning Disabilities

Rubric	Score	Mean	N	Standard Deviation	t	Significance
Thinking Maps	Pre	1.0	3	0.00	a.	
	Post	1.0	3	0.00		
Introduction	Pre	0.7	3	0.58	a.	
	Post	1.7	3	0.58		
Body	Pre	1.0	3	0.00	a.	
	Post	1.0	3	0.00		
Linking Words	Pre	0.7	3	0.58	1.00	0.42
	Post	1.0	3	0.00		
Conclusion	Pre	0.7	3	0.58	1.00	0.42
	Post	1.0	3	0.00		
Total Score	Pre	4.0	3	1.00	2.50	0.13
	Post	5.7	3	0.58		

a. The t-test could not be computed because the difference in the standard deviation of the pretest and posttest was 0.

The hypothesis was that after thinking maps instruction and opportunities for students to use thinking maps there would be no difference in the written responses to writing prompts for fifth graders with Specific Learning Disabilities. This thesis was supported.

CHAPTER V

DISCUSSION

This study examined the effects of providing three fifth grade students with Specific Learning Disabilities thinking map instruction and opportunities to use them to respond to informational/explanatory writing prompts. Students were able to earn a maximum of two rubric points for each of the five areas being evaluated (see attached rubric in Appendix A). The writing rubric was based on a ten-point scale, and the mean score for the total pretest score was 4.0. On the pretest, all three students earned one rubric point for using one thinking map before writing and attempting to develop the topic sentence with supporting details in the body category. However, there was slight variation in each student's performance when attempting to introduce the topic, add linking words, and add a conclusion. Two students were able to earn one rubric point for including an introduction, linking words, and a conclusion. One student earned the fewest total rubric points for failing to include linking words and a conclusion.

After the pretest was given, explicit modeling and guided practice of thinking map instruction, writing prompt analysis, and paragraph development was provided. On the mid-point test, all three students used one thinking map, and the total writing scores decreased by one rubric point for two students. There was no change in the total writing score for one student.

Once the regular instructional schedule resumed, students were provided specific feedback and three weeks of targeted instruction in the areas where students earned zero rubric points on the mid-point test: introduction, linking words, and conclusion. When the posttest was administered, the total score was higher for all three students but not significantly so. The mean score for the total posttest score was 5.7. Although students were instructed on how to use

multiple maps, they repeatedly used only one map, which may have impacted their overall writing score.

Implications

Providing fifth grade students with Specific Learning Disabilities thinking maps instruction and targeted instruction in writing prompt analysis and paragraph development may be beneficial to improving writing performance. The posttest scores were higher for all three students, although not significant.

This study was isolated to three students receiving instruction outside of the general education setting. Perhaps applying the instructional strategies across other subject areas in a co-taught setting in the regular classroom could boost the writing achievement of other struggling writers and refine the writing of more proficient writers. The inclusion model would also support students with Specific Learning Disabilities by giving them opportunities to brainstorm and receive feedback from peers and adults, which research has shown are effective instructional strategies (Graham et al., 2012b; Sundeen, 2007).

Threats to Validity

Although results of this study indicated slight improvements in each student's total writing rubric score, other factors may have affected the reliability of the results. One important factor is the impact of interruptions on the daily instruction timetable due to a combination of student absences and the researcher's schedule. During the instructional phases and mid-point assessment, one or more students was tardy or absent from class a minimum of four times over the eight-week study period. In addition, the researcher was involved with duties related to PARCC preparation and administration for three consecutive weeks and was unable to regularly

meet with students. The lack of instructional time and additional practice opportunities may have influenced the students' ability to recall and apply previously taught skills.

Another consideration is students' use of only one thinking map during the planning stage of the writing process. Although students were taught how to integrate more than one map during instruction to show multiple thinking patterns, they opted to use either a Circle or Tree Map. This may have limited their ability to demonstrate such higher-level thinking skills as recognizing similarities and differences, seeing relationships between concepts, drawing conclusions, and making inferences.

The variation in writing prompt topics may have influenced the test results. For all three students, the posttest total writing rubric score increased one to three points. This improvement may have been related to the fact that the pretest and midpoint writing prompts were primarily based on new information learned in school. The posttest writing prompt was more personal and may have been viewed as less difficult to include the elements of a paragraph when given a familiar topic.

Most importantly, results from this study cannot be generalized to show trends in the writing development of fifth graders with Specific Learning Disabilities based on the small number of participants. However, valuable information related to the specific areas that were assessed on the writing rubric can be used to modify and improve instruction.

<div align="center">**Connections to Previous Studies**</div>

Deane (2011) discusses several reflective mental processes that occur during the writing process and asserts a connection between reading comprehension and writing competency. He further states that critical thinking skills are evident in writing samples based on what information is included and how relationships between concepts are logically presented (Deane,

2011). The research results of this study relate to Deane's claims in that the students' limited writing proficiency skills were reflected in the students' selection of one thinking map with one or two details related to the topic.

Several studies support the claims that explicit teaching paired with models and verbalizations of the metacognitive process as well as use of graphic and visual organizers are effective strategies and tools for struggling writers and students with learning disabilities (Graham et al., 2012b; Sundeen, 2007). The current study used a variety of thinking maps during the instructional phases as a tool for visualizing concepts and comprehending information, which enabled students to organize their ideas before responding to writing prompts.

Suggestions for Future Research

One of the goals of this study was to determine whether students' informational/explanatory writing would improve with the use of thinking maps. In this study, students used only one thinking map, which may have limited the breadth of their written responses and hindered their ability to demonstrate significant gains in the total writing score. Further research could examine the writing quality of students using only one thinking map compared to those using multiple thinking maps during the planning stage of the writing process.

This study lasted a total of eight weeks with several factors that interfered with daily instruction. More instructional time and practice opportunities devoted to using multiple maps as tools for deeper comprehension and writing organization would be an improvement to this study and would help determine if these variables impact overall writing.

Planning the study to include a general education teacher may help minimize gaps in instructional delivery and also may help students apply thinking maps to other subject areas. In

addition, it would be helpful for students to work within the general education setting with non-disabled peers to brainstorm ideas and exchange feedback. In the current study, students worked outside of the general education setting, which prevented them from working alongside classmates.

Finally, this study needs a larger sample size in order to measure the reliability of the results. The current study used only three participants with Specific Learning Disabilities, which made it impossible to generalize the results. Expanding the current study to a class or grade level and then randomly assigning participants would yield insights into the effectiveness of the thinking maps intervention with greater reliability.

References

Anne Arundel County Public Schools. (2013). *Identification of specific learning*

    disabilities. In AACPS eHandbook (Chapter 3-1). Retrieved from

    https://intranet.aacps.org/Dept/specialed/Pages/Default.aspx

Baumann, J. F. (1984). The effectiveness of a direct instruction paradigm for teaching main idea

    comprehension. *Reading Research Quarterly, 20*(1), 93-11.

Buckner, J. (2012). Write from the beginning and beyond: Expository/informative. *Thinking*

    Maps Inc. Retrieved from http://thinkingmaps.com/modes_of_writing.php

Calkins, L. (1994). *The art of teaching writing*. Portsmouth, NH: Heinemann.

CCCC Committee on Assessment. (2014, November 1). *Writing assessment: A position*

    statement. Retrieved March 15, 2015, from

    http://www.ncte.org/cccc/resources/positions/writingassessment

Common Core State Standards Initiative (2014). *English language arts standards: Anchor*

    standards, college and career readiness anchor standards for writing. Retrieved

    November 26, 2014, from http://www.corestandards.org/ELA-Literacy/CCRA/W/

Common Core State Standards Initiative (2015). *Key shifts in English language arts.*

    Retrieved March 15, 2015, from http://www.corestandards.org/other-resources/key-

    shifts-in-english-language-arts/

Common Core State Standards Initiative (2015). *Development process.* Retrieved March 15,

    2015, from http://www.corestandards.org/about-the-standards/development-process/

Common Core State Standards Initiative (2015). *Myths vs. facts.* Retrieved March 15,

    2015, from http://www.corestandards.org/about-the-standards/myths-vs-facts/

Deane, P. (2011). *Writing assessment and cognition* (ETS RR–11-14). Princeton, NJ: ETS

      Retrieved March 3, 2015, from Eric Database.

Deshler, D. D., Ellis, E. S., & Lenz, B. K. (1995). *Teaching adolescents with learning*

      disabilities: Strategies and methods. Denver, CO: Love.

Dexter, D., & Hughes, C. (2011). Graphic organizers and students with learning disabilities: A

      meta-analysis. *Learning Disability Quarterly*, *34*(1), 51-72.

Enz, B. J., & Serafini, F. (1995). Assessment. Involving students in the assessment process.

      Teaching PreK-8, 25(5), 96-97.

Fare, D. M., & Research and Education Association. (2014). *PARCC ELA/literacy assessments:*

      Grades 6-8.

Graham, S. (2006b). Writing. In P. Alexander & P. Winne (Eds.), *Handbook of educational*

      psychology (pp. 457–477). Mahwah, NJ: Erlbaum.

Graham, S., Berninger, V., & Fan, W. (2007). The structural relationship between writing

      attitude and writing achievement in young children. *Contemporary Educational*

      Psychology, 32, 516–536.

Graham, S., Bollinger, A., Booth Olson, C., D'Aoust, C., MacArthur, C., McCutchen, D., &

      Olinghouse, N. (2012a). *Teaching elementary school students to be effective writers: A*

      practice guide (NCEE 2012- 4058). Washington, DC: National Center for Education

      Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of

      Education. Retrieved from http://ies.ed.gov/ncee/

      wwc/publications_reviews.aspx#pubsearch.

Graham, S., & Harris, K. R. (2005). *Writing better: Effective strategies for teaching students*

      with learning difficulties. Baltimore: P.H. Brookes Publishing Company.

Graham, S., McKeown, D., Kiuhara, S., & Harris, K. R. (2012b). A meta-analysis of writing

      instruction for students in the elementary grades. *Journal of Educational Psychology*

      104(4)*,* 879-896.

Holmes, B.C. (1985). The effects of a strategy and sequenced material on the inferential

      comprehension of disabled readers. *Journal of Learning Disabilities*, *18*(9), 542-546. doi:

      10.1177/002221948501800909

Hyerle, D., & Yeager, C. (2007). *Thinking maps: A language for learning*. Carey: Thinking

      Maps Inc.

Johnson, L., Graham, S., & Harris, K. R. (1997). The effects of goal setting and self-instructions

      on learning a reading comprehension strategy: A study with students with learning

      disabilities. *Journal of Learning Disabilities*, *30*(1), 80-91.

Kim, A-H., Vaughn, S., Wanzek, J., & Wei, S. (2004). Graphic organizers and their effects on

      the reading comprehension of students with LD: A synthesis of research. *Journal of*

      Learning Disabilities, *37*(2), 105-118.

Knudson, R.E. (1995). Writing experiences, attitudes, and achievement of first to sixth graders

      Journal of Educational Research, 89(2)*,* 90-97.

Kuzmanovic, B., & Cuevas, A. (2009). *Recent trends in education*. New York: Nova Science

      Publishers.

Miller, W. H. (2000). *Strategies for developing emergent literacy*. Boston: McGraw-Hill.

Monroe, J. (2003). *Local knowledges, local practices: Writing in the disciplines at Cornell*.

      Pittsburgh: University of Pittsburgh Press.

National Center for Education Statistics. (2002). *The nation's report card: Writing 2002*.

      Retrieved November 29, 2014 from

http://nces.ed.gov/nationsreportcard/pubs/main2002/2003529.asp

National Center for Education Statistics. (2012). *Lessons learned from the 2012 grade 4*

writing computer-based assessment (WCBA) study. Retrieved November 29, 2014 from

http://nces.ed.gov/nationsreportcard/writing/lessons/default.aspx

National Commission on Writing. (2003, April). *The neglected "R": The need for a writing*

revolution. Retrieved November 28, 2014, from http://

www.writingcommission.org/prod_downloads/writingcom/neglect- edr.pdf

National Commission on Writing (2004, September). *Writing: A ticket to work ...or a ticket out:*

A survey of business leaders. Retrieved November 28, 2014, from

http://www.writingcommission.org/prod_downloads/writingcom/writing-ticket-to-

work.pdf

National Governors Association Center for Best Practices (2010). *Common Core State Standards*

for English/Language Arts. Washington, DC: Council of Chief State School Officers.

Sadoski, M., Willson, V., & Norton, D. (1997). The relative contribution of research-based

composition activities to writing improvement in lower and middle grades. *Research in*

the Teaching of English, *31*(1), 120–150.

Sundeen, T.H. (2007). So what's the big idea? Using graphic organizers to guide writing for

secondary students with learning and behavioral issues. *Beyond Behavior, 16*(3), 29-34.

Williams, J. P. (1993). Comprehension of students with or without learning disabilities:

Identification of narrative themes and idiosyncratic text representations. *Journal of*

Educational Psychology, *85*(4), 631-641.

Wong, B.Y.L. (2004). *Learning about learning disabilities*. San Diego: Elsevier Academic

Press.

Appendix A
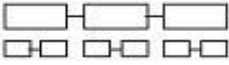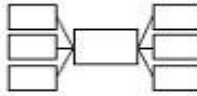
Name_____   Date_____

Informative/Explanatory Rubric

	2	1	0
Thinking Map(s)	Uses more than 1 thinking map	Uses 1 thinking map	Does not use a thinking map
Introduction	**Introduces** the topic by using **some** key words and phrases from the prompt	**Attempts** to introduce the topic by using **one** key word or phrase from the prompt	Does **not** address the prompt
Body	**Consistently** develops the topic sentence by using **3 or more** details, facts, or reasons related to the topic sentence	**Attempts** to develop the topic sentence by using **1-2** details, facts, or reasons related to the topic sentence	Does **not** provide any details, facts, or reasons related to the topic sentence
Linking Words	**Consistently** uses words and phrases to link ideas by using **3 or more** transitional words and phrases	**Occasionally** uses words and phrases to link ideas by using **1-2** transitional words and phrases	Does **not** use words and phrases to link ideas
Conclusion	Provides a concluding statement that includes some key words and phrases from the prompt **and** information presented	**Attempts** to provide a concluding statement by restating **some** key words and phrases from the prompt	Does **not** provide a concluding statement related to the topic
Total Score			/10

Appendix B

Quick-Reference Content Correlation to Eight Thinking Maps for Communication Skills

Circle Map	• Representing and brainstorming ideas • Defining words by showing context clues • Identifying audience and author's point of view	
Bubble Map	• Expanding descriptive vocabulary • Describing characters using adjectives • Providing descriptive details for writing	
Double Bubble Map	• Comparing and contrasting characters • Prioritizing essential characteristics • Organizing a compare-and-contrast essay	
Tree Map	• Identifying main idea, supporting ideas, details • Organizing topics and details for writing • Taking notes for lectures and research papers	
Brace Map	• Comprehending physical setting in stories • Analyzing physical objects from technical reading • Organizing and writing technical manuals	
Flow Map	• Sequencing story plot by stages and substages • Analyzing and prioritizing important events • Sequencing paragraphs for writing	
Multi-Flow Map	• Analyzing causes-effects in literature • Predicting outcomes from previous events • Organizing "if-then" persuasive writing	
Bridge Map	• Comprehending analogies, similes, and metaphors • Preparing for testing using analogies • Developing guiding analogies for writing	