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**USING MULTISENSORY INSTRUCTION TO SUPPORT READING GROWTH
IN A FIFTH GRADE GENERAL EDUCATION CLASSROOM**

by
Alexis C. Cassese Pawlowski

A Thesis

Submitted to the
Department of Language, Literacy, and Sociocultural Education
College of Education
In partial fulfillment of the requirement
For the degree of
Master of Arts in Reading Education
at
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Thesis Advisor: Susan Browne, Ed.D.

Dedications

I'd like to dedicate this thesis to my husband and my daughter, Angelina.

Acknowledgements

I would like to acknowledge my family and friends for their endless support and confidence in me. Thank you to my students and co-teacher for allowing me the opportunity to instill the skills that I have learned in my research, and bring them to life in the classroom.

Additionally, I would like to acknowledge Dr. Browne for her guidance and patience she had with me throughout this writing process.

Abstract

Alexis C. Cassese Pawlowski
USING MULTISENSORY INSTRUCTION TO SUPPORT READING GROWTH IN A
FIFTH GRADE GENERAL EDUCATION CLASSROOM
2018-2019

Susan Browne, Ed.D.
Master of Arts in Reading Education

The purpose of this research study was to engage fifth grade students in multisensory instruction in order to improve reading, specifically at the complex word level. Embedding multisensory techniques can be effective in promoting engagement in reading for students in fifth grade. The goal of this research project was to determine the effects that multisensory instruction has on readers in fifth grade. The main research question that guided this study was: How does multisensory instruction support growth in reading for 5th grade students? Five students in fifth grade participated in a five-week study where data was gathered to determine their growth in reading, and their levels of engagement during each multisensory instructional strategy. The data suggests that incorporating activities that are comprised of more than one modality increases student's decoding abilities and reading engagement. Engaging students in instruction on morphological awareness, using multisensory strategies, increases reading performance.

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Chapter 1

Introduction

“I’m bored,” I hear one of my students mumble under his breath. “When can we have fun?” he asks sternly. A question, perhaps unintentionally asked on several occasions. Perhaps, he makes this statement very intentionally as he is a student who needs to be active, who likes to be in control. “How can you be bored,” I ask, “when you have been given a task that requires all of your attention?!”

It has been six years since I have found myself teaching language arts in a collaborative setting, as opposed to a special education resource classroom, and what a difference six years makes. Is it just me, or do our students seem less motivated and uninterested in their academic performance. I think about the curriculum we are being asked to teach, and the rigor that comes with it. “Is it just too hard?” “Are they not getting it?” “Do they just not want to do it?” Questions that I ask myself on a daily basis.

I ponder over what our day to day looks like. They seem engaged when they are working in partnerships, most listen intently as we read our class read aloud, some even ask deeper thinking questions and make connections to what they are hearing. I observe students taking on leadership roles when working in groups, and boy are they competitive when involved in whole group games, even ones that are academic based. So, how are they bored? When are they bored?

Our Language Arts block is split into two sessions; a 30-minute session in the morning and an hour and forty minutes in the afternoon. Our students have many opportunities for movement throughout the day. Clearly though, our students need more.

They are seeking more. So, I wonder when and how can we make this time more engaging for them?

Purpose Statement

In 2017, the National Assessment of Educational Progress (NAEP) reported that only 31% of fourth graders performed at the *Basic* achievement level in reading, while only 36% of students performed at or above the *Proficient* level. The achievement of reading skills is a long-term process as students build their skills gradually and adjust them over time. The Carnegie Council on Advancing Adolescent Literacy (2010), pointed out that, “beyond grade 3, adolescent learners...must decipher more complex passages, synthesize information at a higher level, and learn to form independent conclusions based on evidence,” (p. x).

Researchers have found that an explicit, systematic approach is crucial in student learning. Ehri et al (2001), states that “...because research suggests that a systematic phonics approach is more effective than non-systematic approaches, children should be provided with systematic phonics instruction as part of a balanced reading program,” (p. 394). Orton and Gillingham created a method of instruction that assists students in making several visual, auditory, and kinesthetic linkages, through an explicit, direct, systematic approach (Henry, 1998).

Although it is hoped that the basic components of reading are in place by fourth grade, this does not mean that students no longer benefit from continued instruction in the areas of phonemic awareness, phonics, and fluency, especially since students in the upper grades must learn multisyllabic words, including words where prefixes and suffixes are added to roots, (Birsch, 2011). When students do not receive explicit instruction in the

basic components of reading, they will continue to struggle as they get older, (Birsch, 2011).

Complex words make up about 60% of vocabulary words that students learn in fourth grade and above. Studying morphological awareness helps to develop vocabulary, decoding, and spelling skills. There are two methods of word analysis that help students to decode words. One method is breaking a word down by syllable, and the second is determining specific word elements that construct a word. Both methods are beneficial to teach, as one method may be more effective for one word and the other for a different word (Wilson, 2017).

Multisensory instruction is a way for teachers to engage students in the learning process. Many researchers have found that students who are deemed “at risk” are tactile learners, (Honigfeld & Dunn, 2009). Rather than learn from traditional teaching, they respond to hands on activities that may be “activity-oriented,” (Honigfeld & Dunn, 2009). As teachers, it is imperative that we adjust our teaching in order for our students to learn.

As students reach the intermediate grades, research has shown that there is a decline in motivation and engagement. Instruction must be improved to meet students needs academically. Even at the basic level, students need to be engaged in order for overall comprehension to occur, (Torgesen et al, 2007). Guthrie et al. (2004) states that, “Engagement in reading refers to interaction with text that is simultaneously motivated and strategic” (p. 403).

The purpose of this research study was to engage fifth grade students in multisensory instruction in order to improve reading, specifically at the complex word

level. This level includes decoding words that have affixes connected to root words. Embedding multisensory techniques can be effective in promoting engagement in reading for students in fifth grade. The goal of this research project was to determine the effects that multisensory instruction has on readers in fifth grade.

Statement of Research Problem and Question

Research has shown the benefits that multisensory instruction has had on students in the primary grades, specifically during phonemic awareness and phonics instruction. Many students in the intermediate grades who are considered to be reading below grade level, are deemed struggling readers. These students can also benefit from multisensory instruction. Multisensory instruction not only helps students connect language to words, but it can increase engagement, and motivate students to increase their reading abilities, (Birsch, 2011).

The main research question that guided this study was: How does multisensory instruction support growth in reading for 5th grade students? Sub questions that emerged from this question are: How does student engagement increase growth in reading? In what ways does morphological awareness support growth in reading? How does multisensory instruction support vocabulary acquisition?

Story of the Question

It wasn't until my second year of teaching that I became familiar with the term *multisensory*. I had graduated from my undergraduate studies, worked as a para-educator and substitute teacher, then finally as a special education teacher, teaching language arts in the resource setting. This is a small group setting where students are pulled from their mainstream class for language arts instruction. Yet, I hadn't heard of the term so widely

used in education. Was I incorporating strategies in my classroom that were engaging students? I hoped that I was!

During this time, several of my colleagues and I were given the opportunity to earn a certificate as *Orton-Gillingham Teachers* through Fairleigh Dickinson University. This certificate program prepares teachers in multisensory structured language education, using an Orton-Gillingham approach. How could I pass up this chance? I immediately become enthralled with word study. For the first time ever, I was connecting sounds with letters, something that just came naturally for me, but now had meaning. I learned spelling rules that I never knew existed, I learned how to implement phonemic awareness strategies and incorporate strategies that used not only auditory stimuli, but visual and tactile ones as well.

After our first two semesters came to an end, we began our last year of instruction, which focused on complex word structures, learning about Latin and Greek roots, and adding prefixes and suffixes to them. Was this what I was supposed to be teaching my students?! What a complex concept! How was I supposed to engage students in learning these word elements? What a learning experience those two years were. I learned that many activities I was already doing with students were multisensory based; playing a ball toss game to review spelling words, tapping out phonemes to listen for the sounds they make, and reading words by part to decode them. All of these activities activated more than one sense.

Fast forward to this year, and for the first time in six years, I was teaching fifth grade language arts in the general education setting with a collaborative teacher. Both of us returning from maternity leave, we were both new to the word study and vocabulary

units that were being implemented in the upper grades. What we learned was that we had free range to explore these concepts with our students. The scope and sequence was already provided for us, so the question was, “How can we make this fun and engaging for students, so that they really understand the word parts and concepts we are teaching them?”

My training as an Orton-Gillingham teacher has provided me with the tools necessary to implement multisensory techniques in the classroom. This study examined how those strategies impact the learning of fifth graders.

Organization of the Paper

Chapter two reviews the literature pertaining to multisensory instruction, instruction in morphology, and student engagement. Chapter three discusses the context of the study and the design, as well as provides information regarding participants. In this section the pre- and post- tests are explained, and the activities that were utilized during instruction are discussed. Chapter four focuses on the data that was collected. It presents an analysis of the findings, as well as the gains that were made. Lastly, chapter five concludes the study by providing a summary of the results found and providing implications for the study.

Chapter 2

Literature Review

Introduction

Since the enactment of No Child Left Behind (NCLB) was put into place in 2002, standardized tests have been a driving force for classroom instruction. Many schools continue to implement instruction that follows “traditional teaching,” lectures with note-taking, end of unit quizzes, and assigned readings. However, many students, particularly those who are deemed “at risk” do not perform well on these assessments, (Honigsfeld & Dunn, 2009). In 2009, the National Assessment of Educational Progress (NAEP), reported that 33% of fourth- graders in the United States scored below the basic level in overall reading, while 34% scored at the basic level (Birsh, 2011). To decrease the struggles students are having in the classroom, teachers should implement strategies that meet students’ needs, engage students in learning, and promote success.

Effective instruction is imperative for student growth. Studies have shown that brain changes occur when instruction is provided in an explicit, systematic, cumulative, and multisensory manner. Sprenger (1999) noted that active participation stimulates brain growth. Because the brain is easily influenced by outside factors, engaging in various modalities will ensure retention of learned information.

Students in the intermediate grades and above “must be able to decode and read text fluently, understand advanced vocabulary, and comprehend advanced texts,” (Birsch, 2011, p.487). According to Birsh (2011), Jeanne S. Chall (1983) explained that students learn to read, and then they read to learn. They are expected to do so once they reach intermediate grades. Reading to learn can be extremely demanding of students if they are

lacking sufficient reading skills. Providing students with multisensory instruction can help them develop skills to succeed in reading.

Chapter two reviews the literature pertaining to multisensory instruction and its influence on students' reading ability and reading engagement, specifically through instruction in morphology. It also focuses on research related to multi-sensory methods used in the classroom and the effects it has had on reading instruction. It is divided into three sections. Section one defines multisensory instruction and explains the theory behind this type of instruction. Section two explores the effects morphological instruction has on reading and section three focuses on the studies related to student engagement.

Multisensory Instruction

According to Walet (2011), "Multisensory instruction capitalizes on the different learning styles by utilizing all the pathways students have for acquiring knowledge and skills," (p.85). Effective instruction taps into the individual needs of all students. No one student learns the same, so using engaging strategies that incorporates more than one sense, will help to ensure that all learners are being reached. Implementing more than one sensory modality simultaneously helps students improve how they take in information and understand it. Using visual, auditory, kinesthetic, and tactile approaches provides students with multiple pathways of learning (Walet, 2011).

Morin (2018), provides a basic understanding of multisensory instruction, in which students are taught in more than one way. She explains that programs that use a multisensory approach, "deliberately use sight, sound, movement and touch to help kids connect language to words."

Samuel Orton and Anna Gillingham “pioneered” the multisensory approach to learning. In the late 1920’s Orton “called for education methods based on simultaneous association of visual, auditory, and kinesthetic fields... he stated that listening, speaking, reading, and writing were interrelated functions of language that must be taught in tandem” (Birsch, 2011, p. 28). As a scientist, Orton understood the neurological benefits that multisensory instruction, in conjunction with a systematic, explicit, and direct approach, have on the brain. In the 1920’s he studied children who had language - processing difficulties and devised teaching principles for these types of learners. He partnered with Anna Gillingham to create a method of instruction for teachers to utilize in the classroom. “She organized the steps of language teaching, going from the simplest sounds in isolation, to syllables, words, phrases, and sentences” (Academy of Orton-Gillingham, 2012). The Orton-Gillingham approach is a systematic, sequential, multisensory approach to reading instruction that was developed to increase learning in the areas of phonology and phonological awareness.

Campbell et al (2008) believes that students are too often taught indirectly. They spend more time watching and listening to the teacher or other students than they do actually reading. One solution for students who may be “at risk” for reading failure, is the addition of multisensory elements incorporated into a systematic phonics program. Teaching students simultaneously through visual, auditory, and kinesthetic strategies improves their memory and learning (Campbell et al., 2008). Multisensory strategies can help them to decode words and ultimately becoming a more fluent reader that can comprehend more complex texts.

Campbell et al (2008), conducted a study looking closely at adding multisensory

elements to an existing phonics program that followed an explicit, systematic approach. The school wide reading program that was utilized was called, *Open Court Reading* and the supplemental program was called *Early Reading Tutor*. Participants in the study included six second grade students who received ten additional minutes of instruction using the supplemental reading program. During the ten minutes, students participated in finger tapping, forming letters on carpet squares, and creating words using magnetic letters.

Students in this study were also tested on their ability to generalize decoding skills to connected text. This was done through oral reading fluency, word attack, word recognition, and passage comprehension.

Using DIBELS, the primary dependent measure was the number of nonsense words read per minute, and the collateral measure was the number of sounds within a nonsense word read per minute. The supplemental reading program provided instruction in auditory blending and segmenting and explicit phonics skills of letter sound correspondences, reading phonetically regular words, and decoding a text.

Although studies do show that students who receive instruction with a multisensory approach show growth in reading, the article stated that there is little empirical studies that prove that a multisensory program is valuable. The results from this study showed that students did show improvement when receiving multisensory instruction.

Similarly, Joshi et al (2002), conducted a study that took a closer look at the effects of multisensory teaching on the reading skills of about 40,000 first graders. This study specifically looked at whether or not first graders performed better in basic reading

skills of phonological awareness, decoding, and comprehension, after one year of instruction compared to students who received “conventional” learning.

The Language Basics: Elementary program was used in this study and included learning through auditory, visual, and kinesthetic approaches. Each lesson was made up of eleven components and moved through a sequential order. The program was used in conjunction with the district’s reading program, Houghton-Mifflin Basal Reading Program. Results indicated that students that received the supplemental multisensory program, showed higher gains in all three areas; phonological awareness, decoding, and reading comprehension.

According to Magpuri - Lavell et al (2014), “Research in reading has shown that fluent, accurate decoding is a hallmark of skilled reading,” (p. 362). They have cited the effectiveness of an Orton - Gillingham approach to learning, particularly in “clinical settings” but have noted that there are few studies that examine the effects of multisensory instruction in the general education setting. Rather, several studies on multisensory instruction have been focused on evaluating the reading growth of students who are either determined to be “at risk,” have learning disabilities, specifically dyslexia, and students who are learning a foreign language.

Magpuri-Lavell et al (2014) conducted a study that examined the effects that the Simultaneous Multisensory Institute for Language Arts (SMILA) approach had on students between the ages of seven to eleven, during a summer reading program. This approach is used to teach sound-symbol relationships, reading accuracy, including automatic word recognition, and fluency. The SMILA approach, based off of the Orton-Gillingham approach, was used to teach handwriting, phonemic awareness, and a new

phonetic concept. Students were engaged using three modalities of instruction; tactile or kinesthetic, visual, and auditory. During 4 weeks in June, participants received approximately 60 hours of instruction and progress was measured using pre- and post-tests. Results indicated that students showed a significant increase in sound-symbol relationship, word knowledge, and oral reading fluency.

Several studies have been conducted researching the effects that a multisensory approach has on individuals with dyslexia. Berninger et al (2013), conducted a study that identified effective treatments for students with dyslexia. Focusing primarily on spelling and word decoding problems, 24 students in grades four - nine participated in the study. Students participated in a readers - writers workshop after school for one hour, twice a week during a five month period, 30 lessons in total. Students were randomly assigned to treatment group A or B.

Berninger et al (2013), incorporated both reading and writing instruction in this study. All 30 lessons were divided into steps, and participants success was evaluated after each step. Step one, completed during six lessons, involved students in both Treatment groups. Students were instructed on oral grapheme - phoneme correspondences strategies, using the *Talking Letters* program. Multisensory strategies were incorporated in this step through the use of saying letter sounds while and touching the grapheme. During step two, completed during eight lessons, both groups continued instruction on oral grapheme - phoneme correspondences, however treatment group A also received spelling instruction, and treatment group B received phonological awareness instruction. During this step, students in treatment group B used kinesthetic methods, such as clapping their hands for syllables and word parts.

During step three which was completed throughout four lessons, treatment group A received instruction in orthographic spelling strategies instruction, while instruction from step two continued. During this step, students in treatment group A used visual and auditory methods to learn new words and word parts. Treatment group B continued with instruction from step two; grapheme - phoneme correspondences and phonological awareness instruction. Lastly, step four occurred throughout 12 lessons. Students in treatment group A received instruction in morphological strategies, while continuing rapid accelerated reading training, and students in treatment group B received instruction on orthographic spelling strategies. Students in treatment group A manipulated word parts through word sorts, engaged their kinesthetic and visual modalities.

Evaluating student growth after each step, helped the authors of this study determine the effects of the change that occurred at each step. Overall, students in both treatment groups demonstrated growth in automatic letter writing, spelling real words, and fluency. After step 3, Berninger et al (2013), found that students in treatment group A had significant growth on phonological decoding than students in treatment group B.

Morphological Instruction

According to the National Reading Panel (2000), there are five critical components in learning to read. They include phonemic awareness, phonics, vocabulary development, fluency, and reading comprehension strategies. Phonics is an essential component to reading. As students approach the upper grades they may experience difficulty with determining word patterns of roots, prefixes, and suffixes. Learning the sounds of the language is important but older students must also learn total word structure, (Birsh, 2011). “Spelling instruction that emphasizes syllable types assists older

students with word-analysis skills” (Birsh, 2011 p. 497). Explicitly learning the seven syllable types and applying them to unknown words can improve fluency.

Syllabication is a skill that involves segmenting multisyllabic words into syllables so that each syllable contains a vowel. Syllabication is an important skill that helps students read challenging words. Unfortunately, there are mixed results on the effectiveness of syllabication instruction, and to what extent multisyllabic instruction deems necessary for students beyond third grade (Bhattacharya & Ehri, 2004; Birsh, 2011). In order for older students to feel successful with reading longer words, syllabication is a skill that is important to teach.

To become proficient readers students must develop phonological awareness, orthographic knowledge, and alphabetic reading skills. However, according to Reed (2008), 25% of students who were at risk for reading failure and were provided instruction in “auditory discrimination, phonics, and word identification have still shown limited growth in foundational reading skills,” (p. 36.) Wilson (2017) suggests that directly teaching students written word elements will effectively help them to understand word structures and apply that knowledge to decode and spell words.

One effective strategy to help older students understand and apply word structure is through explicit teaching of morphology, which in turn also benefits vocabulary instruction. A morpheme is the smallest unit of *meaning* (not sound). According to Birsh (2011), the English language is comprised of 20 prefixes that represent 97% of words with prefixes. Teaching students to add prefixes and suffixes to root words, will help increase their reading abilities.

One way to process morphology is through a multisensory technique called decomposition; breaking a word down by its meaningful parts. When students learn individual morphemes, these morphemes are what become encoded in memory, not the whole word. Decomposing words is a multisensory strategy that can help students determine the overall meaning and pronunciation of more complicated words (Reed, 2008).

Nagy, Berninger & Abbott (2006) found that morphological instruction contributed to reading comprehension, vocabulary, and spelling. They conducted a study that focused on three areas; the contribution morphological awareness had on literacy outcomes, whether the contributions to literacy outcomes were greater in grades 4 and above compared to past studies in the younger grades, and whether morphological awareness contributes differently to various literacy outcomes. 607 students in grades four through nine were group tested, and individually tested in a variety of subtests that assessed reading comprehension and vocabulary. Morphological awareness tests were given, as well as spelling dictation tests. They found that morphological awareness contributed to reading comprehension, vocabulary, and spelling in all grade levels. Their study suggests that student in the intermediate grades are at the stage where word development is crucial for reading success.

Syllabication is an important strategy for students to learn in order to read words. Bhattacharya and Ehri (2004), conducted a study that focused on the comparison between whole word learning versus analyzing the graphosyllabic units of words. Students in grades 6-10 who participated in this study were two to five years below grade level. Students were assigned to one of three groups, a whole word reading group, a syllable

analysis group, and a group that was not given special instruction. Groups were instructed for 30 minutes during six sessions.

Posttests were given to determine if graphosyllabic analysis had been learned during training and to assess whether the two types of treatment enhanced students' word-reading and spelling skills above those of students who did not receive treatment. Both groups practiced reading 100 words by either analyzing syllables or by reading the words as wholes. They reread four sets of 25 words for several trials. Results indicated that students showed growth when learning the process to decode multisyllabic words rather than reading words as a whole.

Finding effective strategies to solve unknown words using morphology, continues to be a challenge that teachers face. Pacheco and Goodwin (2013), conducted a study to determine strategies that middle school readers benefit from when tackling complex words. They began their study by interviewing 20 students in grades seven and eight from two different middle schools in the United States. In one school, students spent 15 minutes a day on Greek and Latin morpheme instruction, while students in the other school had daily instruction on vocabulary, but little to no morphological instruction. Interviews were conducted in two parts. During the first half of the interviews students were shown words on a notecard, and asked several questions including if they had seen the word, knew its meaning, and how they could determine the meaning if they did not know it. During the second half the interview, students were shown a pair of words that shared a root or affix. Along with the questions from the first half of the interview, students were asked to determine the similarities between the two words. Strategies used were coding as Part-to-Whole, Parts-to-Whole, Analogy, and Whole-to-Parts. Once the

strategy was determined, the authors coded which morphemic parts were used.

It was determined that both struggling and proficient readers do use morphological problem-solving strategies; struggling readers 61.2% of the time and proficient readers 67.9%. Students used the Parts-to-Whole strategy most often, 60% of the time by proficient readers and 39% by struggling readers. The Part-to-Whole strategy was used in 9% of successful “problem-solving events,” while Analogy was used in only 4%, and Whole-to-Parts was used in 13% of successful “problem-solving events” and when students already knew the word. Additionally, many students used more than one strategy when problem-solving unknown words. Morphological instruction can build a student’s vocabulary acquisition and help to improve comprehension.

McCutchen and Logan (2011) state that, “morphological skill might support comprehension in a number of ways, some direct and some indirect,” (p. 334). They believe that morphological awareness may increase fluency, word meanings, and vocabulary growth. McCutchen and Logan (2011), conducted a study that focused on the relationship that morphological analysis has on vocabulary and comprehension. Participants included 88 fifth-graders and 74 eighth-graders who were given two morphological tasks to complete.

The first task was a morphological task. Students were given a word and they had to “produce a derivation to fit a sentence context” (p. 336). This task demonstrated students’ knowledge of morphologically related words. The second task examined students’ ability to infer word meanings based on their morphemes. Results from these tasks showed that students were able to identify the meanings of words when they knew the constituents that make up the morphological structure. McCutchen and Logan (2011),

determined that the data from this study suggests that the use of morphological analysis helps students build on vocabulary and supports comprehension, however they also established that more research is needed on the effects of morphological skills.

According to Berninger et al (2013), “English is a morphophonemic language... learning to read and spell requires learning the interrelationships among the phonological codes in spoken words, orthographic codes in written words, and morphological codes in spoken and written words,” (p. 4). Effective instruction may require teaching students in a way that interrelates the phonological, orthographic, and morphological relationships of words. Multisensory instruction aides in the understanding of morphology and helps students to learn the written language.

Student Engagement

Instruction that promotes interaction can increase student engagement in learning. Both environmental factors and instructional strategies can help to increase student engagement in the classroom. Morgan et al (2012) states, “Learning tasks are constructed to engage the learner in the learning process...” (p. 2). When students are directly involved in their learning they will be more inclined to want to learn, thus engaged in the learning process.

First explored by John T. Guthrie, engagement and motivation has been highly researched in the field of education. Guthrie and Wigfield developed a theoretical model that stemmed from the study and analysis of published research focused on reading motivation and engagement in the classroom (Guthrie & Wigfield, 2000) and from the previous work of Guthrie and Wigfield.

At the core of their Engagement Model of Reading Development are the desired student outcomes: achievement, knowledge, and practices. Achieving these outcomes involves the four processes of reading engagement: motivations, strategy use, conceptual knowledge, and social interactions. These processes are supported by nine key classroom characteristics: learning and knowledge goals, real-world interactions, autonomy support, interesting text, strategy instruction, collaboration support, rewards and praise, evaluation, and teacher involvement (Guthrie & Wigfield, 2000).

In collaborating with teachers, reading specialists, and educational psychologists, Guthrie and Wigfield developed Concept-Oriented Reading Instruction (CORI). This program investigates the “links between reading and motivation,” (Guthrie & Wigfield, 2010, p. ix). The CORI framework was based off of Guthrie’s Engagement Model of Reading Development. The framework, which was created to aid students reading comprehension, includes four strands: “reading strategy instruction, inquiry science, motivational support, and reading science integrations” (Guthrie & Wigfield, 2010, p. 6). Strategies that are taught using the CORI model are derived from the 2000 National Reading Panel Report.

Guthrie and Cox (2001), explored the reading engagement of fifth grade students, using the CORI model. The study was divided into three parts. In the first year, they began their study in Science, where students learned about the phases of the moon, and characteristics of the planets. Guthrie and Cox (2001) began the unit by finding a hands-on activity to motivate students. In doing this, students were invested in their work and created a basis for their own learning, which motivated them to conduct the research needed, thus reading about their topic in an engaging way. When provided with multiple

text on students' topics, Guthrie and Cox (2001) noted that "direct strategy instruction" was imperative to student's reading success.

Students spent five weeks learning an integrated reading and science unit, which followed with a five-week follow up unit in reading that involved students reading a novel that related to their work in the science unit.

When compared to students in the same grade who were not taught using the CORI model, students in the CORI classroom "read more frequently and widely ... [and] showed more curiosity, involvement in reading, preference for challenging books, social exchange, and competitiveness," (Guthrie & Cox, 2001, p.285). After the ten-week study was complete Guthrie and Cox (2001) determined that there are "four phases of teaching for long-term reading engagement." These phases are "Observe and Personalize," "Search and Retrieve," "Comprehend and Integrate," and "Communicate with Others." The following year they extended this four-phase model in conjunction with the CORI model to two other classrooms, in order to determine if their framework was productive "for increasing engagement." They found that classrooms that incorporated the CORI model showed increased engagement in reading.

Theorists Norman Unrau & Matthew Quirk have also researched motivation and engagement in reading. They state, "Engagement manifests as involvement in some activity... [it] would include indicators of action in and interaction with the environment," (2014, p. 204). When students are physically active in their learning, they are more apt to be fully engaged.

According to Harmon et al. (2009), broadening and deepening word knowledge is a goal for older readers, "as well as helping students develop and maintain awareness,

interest, and motivation for learning new words” (p.399). In their study, they suggest engaging students in activities surrounding an interactive word wall to promote vocabulary acquisition. At the middle- and secondary level, word walls can serve as “visible and concrete tools” to expand the knowledge of the curriculum, that includes Greek and Latin roots, prefixes, and suffixes, and inflectional endings to words. Harmon et al (2009) found that active engagement in word study increased vocabulary acquisition of seventh grade learners.

Conclusion

Research shows that instruction in reading needs to be language based, and provided with an intensive, systematic, direct, and comprehensive approach. Using a multisensory approach can build understanding and increase student achievement in reading, as well as actively engage students in their learning.

Using multisensory strategies to teach morphological concepts can help students to read multisyllabic words and build on their vocabulary acquisition. Studies have shown that using more than one modality can increase reading ability in all areas.

This study hopes to illustrate the benefits that multisensory instruction has on students’ learning in the upper grades. It attempts to shed light on growth that readers may have when incorporating multisensory techniques to decoding multisyllabic words, spelling skills, and building on vocabulary acquisition, while engaging readers in the process. The next section of this thesis will examine the context and design of the research study.

Chapter 3

Methodology

Context

The study sight took place in one of three elementary schools in an affluent suburban school district in Northern New Jersey. According to the 2016 United States Census Bureau, the population of the town was 10,852. The town is a predominantly a white community, with 69% blue collar workers and 31% white collar workers.

The school, built in 2004, is one of four schools in the district. The district is comprised of three elementary schools and one middle school. After eighth grade, students from this town and surrounding towns feed into two high schools, which are their own district. The elementary school in which this study takes place serves students in grades Pre-K through fifth and hosts a program for students with Autism. There are approximately 332 students total in the school.

The fifth-grade class in which this study took place, was a collaborative Language Arts class. The Language Arts block was split into two sessions; a 30 minute session in the morning and 100 minute session in the afternoon, daily. Typically, Spelling and Word Study instruction were taught during the morning session, while Reading and Writing instruction were taught in the afternoon.

The class was taught using several resources. Reading was taught using Lucy Calkins' Units of Study and Junior Great Books, and writing was taught using the Being a Writer program. The Word Study units were two -fold, incorporating spelling and

vocabulary, from two different programs, Spelling Connections for spelling instruction and Building Vocabulary from Word Roots was used to meet student's vocabulary needs through a study of word roots and affixes.

The addition of the vocabulary component for word study stemmed from a systematic approach to word awareness and vocabulary building. Through this particular unit of study, the goal was to teach students essential word strategies that enable them to determine the meaning of words based on word parts, thus increasing student's oral, written, and listening vocabulary all while building word recognition strategies to impact reading comprehension. Prior to the study beginning, instruction in this area was often lecture based, and consisted of students completing workbook pages. Students rarely, if not at all, engaged with one or with the content being taught. It seemed as though students moved through the motions of completing their work rather than understanding the rules and concepts being taught in Word Study.

Research Design

Guided by teacher inquiry, the framework for this study is the qualitative research paradigm. According to Shagoury & Power (2012), "teacher research involves collecting and analyzing data as well as presenting it to others in a systematic way," (p.3). Teacher researchers ask questions, gather data from their own school settings, and analyze that data. Cochran-Smith & Lytle (2009) state, that the purpose of teacher research "is about generating deeper understandings of how students learn - from the perspective of those

who do the work,” (p. 58). Teacher research allows practitioners to delve deeper in their own teaching environment and develop “best practices,” (Cochran-Smith & Lytle, 2009).

Teacher research is devised of qualitative research, meaning that the skills and activities that are implemented in studies are already part of the classroom environment. The goal of the teacher researcher is to create a learning environment that best meets the needs of the students (Shagoury & Power 2012). A teacher’s primary purpose for conducting research is to help “the teacher - researcher understand her students and improve her practice in specific, concrete ways,” (Shagoury & Power, 2012, p. 4).

The goal of this research project is to determine the effects that multisensory instruction has on fifth grade reading. The purpose of this research study is to engage students in multisensory activities that are aligned to district curriculum. The qualitative inquiry strategies that were used to collect data included pre- and post- spelling and vocabulary assessments, photos to document student engagement, and my teacher journal.

Participants

Students in one of the two fifth grade classes were chosen for this study. Five out of the thirteen students were selected to fully participate in this study. Of the five students, one was female and four were male. These five participants began the school year reading at or below grade level.

Three times during the school year, student’s reading levels were assessed using the Diagnostic Reading Assessment (DRA). At the end of the first marking period, in

fifth grade, it is expected that students are reading independently at a level T. According to the district report card rubric, students are expected to use a variety of strategies to solve words, search for and use information from a text, make inferences, think critically about a text, and synthesize new information, just to name a few. Of the 13 students in the class, three students were reading at a level T, seven students were approaching grade level expectations and reading at a level S, and one student was reading above grade level at a U, while two students were at risk, reading at a level Q.

Student 1. Student one, a male, is a quiet student who follows directions and often asks for clarification when needed. At the beginning of the year he was found to be reading independently at a level 40 (S), receiving an oral reading fluency score of 14/16, reading 103 words per minute, and comprehension score of 18/24 on a fiction text. On the pre-assessments, student one scored 17 out of 27 (63%) on the Vocabulary Diagnostic Assessment and a 32/50 (64%) on the Diagnostic Spelling Assessment. Additionally, when determining affixes in a word, student one was able to correctly code four out of six words.

Student 2. Student two, a male, has an Individualized Education Plan to help him fully succeed in the general education classroom. At the time of this study, student two's Special Education Program placed him in an In-Class support Language Arts class. At the beginning of the year he was found to be reading independently at a level 40 (S), receiving an oral reading fluency score of 12/16, reading 85 words per minute, and comprehension score of 17/24 on a fiction text. On the pre-assessments, student two

scored 20 out of 27 (74%) on the Vocabulary Diagnostic Assessment and a 24/50 (48%) on the Diagnostic Spelling Assessment. When determining affixes in a word, student two was unable to correctly code any of the six words, and he was only able to identify one of the suffixes.

Student 3. Student three, a male, has a 504 Accommodation Plan to help him fully succeed in the general education classroom. At the beginning of the year he was found to be reading independently at a level 40 (S), receiving an oral reading fluency score of 13/16, reading 105 words per minute, and comprehension score of 18/24 on a nonfiction text. On the pre-assessments, student three scored 12 out of 27 (44%) on the Vocabulary Diagnostic Assessment and a 37/50 (74%) on the Diagnostic Spelling Assessment. When determining affixes in a words, student two was unable to correctly code any of the six words, however he was able to identify six of the prefixes.

Student 4. Student four is also a male. He has a lot of energy and although strives to do well, struggles to stay focused. At the beginning of the year he was found to be reading independently at a level 38 (P), receiving an oral reading fluency score of 13/16, reading 119 words per minute, and comprehension score of 18/24 on a nonfiction text. On the pre-assessments, student four scored 16 out of 27 (60%) on the Vocabulary Diagnostic Assessment and a 43/50 (86%) on the Diagnostic Spelling Assessment. When determining affixes in a words, student four was able to correctly code four of the six words.

Student 5. Student five is a female. She is a social student, but does need to be redirected often to focus during instruction. At the beginning of the year she was found to be reading at an instructional level 40 (S), receiving an oral reading fluency score of 14/16, reading 122 words per minute, and comprehension score of 13/24, 4 points below independent, on a fiction text. On the pre-assessments, student five scored 15 out of 27 (56%) on the Vocabulary Diagnostic Assessment and a 28/50 (56%) on the Diagnostic Spelling Assessment. When determining affixes in a words, student five was unable to correctly code any of the six words, however she was able to identify four of the prefixes.

Procedure of the Study

Prior to beginning the study, I informally evaluated the Word Study and Vocabulary units for fifth grade. My goal for doing this was to become familiar with these newer units and determine the extent at which students are engaged and demonstrating deeper learning and understanding of the content. The scope and sequence of both the spelling and vocabulary units were prioritized based on the generalized needs of students on grade level, and teachers were encouraged to exercise autonomy in implementing these units. In this study, multisensory instruction was incorporated in a fifth grade language arts class.

Baseline data was gathered through three forms of assessment to determine students prior knowledge of word structure, decoding abilities, and vocabulary sense. Weekly word study lessons incorporated auditory, visual, tactile, and kinesthetic strategies. At the beginning of each week, students were introduced to the new root(s) or

spelling feature. Each proceeding day students implemented a variety of multisensory strategies to learn the root words or features. Many of the lessons also included collaboration between students. During each lesson, my observations about the students and the classroom were documented through photos and described in my teacher research journal.

On the first day of each week, instruction began with an introduction to the new root or spelling feature. Prior to the definition being given, student's worked in pairs to brainstorm words they already knew and determined their own meanings. They then documented the new feature in their word study binders. The second day of instruction included one of two strategies, morphological awareness activities using unifix cubes, or reading and highlighting word lists. Both strategies allowed for students to understand, analyze, and manipulate morphemes within words. On day three, students practiced writing words by chunking them by syllable or by word element. On the fourth day of instruction students worked in groups to create words based on pre-made matrices. To make this activity more tactile, affixes were written on notecards and color coded by prefixes, roots, and suffixes. Students were instructed to create words, determine their meaning and write them on chart paper. Additionally, during independent reading, students were encouraged to use strategies taught to tackle multisyllabic words and determine the meaning of those words. Lastly, on Fridays when Spelling was being taught, students took a post spelling assessment.

Data Collection

To determine if multisensory instruction had an effect on reading, three forms of data were collected. One data source included three forms of pre- and post- assessments, a diagnostic vocabulary quiz, a verbal decoding quiz, and an affixes quiz to determine students' knowledge of prefixes, roots, and suffixes in grade level appropriate words. These assessments documented student's ability to identify morphemes, decode multisyllabic words and chunk words by word elements, and determine vocabulary sense. These assessments were given twice during the study. Once before interventions were implemented to determine students' initial abilities and again at the end of the study to determine what kind of growth may have been made.

Additionally, prior to the start of this study, students took a Diagnostic Spelling Assessment from the Spelling Connections curriculum to determine their individual spelling needs. Every two weeks, when spelling units were taught, students took a pre- and post- test to determine their ability to spell words that contained the spelling feature for that week. Students were not formally assessed on root word knowledge that was taught during vocabulary instruction. In addition to these assessments, beginning of the year reading assessments were compared to mid year reading assessments that focused on reading level and fluency.

The second source of data collected was photographs of students interactions during lessons. This data source provided evidence of student engagement related to the use of multisensory instruction. The use of photography was used daily during each

lesson. The third data source was my teacher research journal. Anecdotal notes were written in my teacher journal daily and documented my own thoughts and reflections regarding the strategies implemented as well as student engagement and behavior.

Analyzing Data

The data collected throughout this study was used to help determine how multisensory instruction supports growth in reading for students in fifth grade. The data collected was analyzed through a process of triangulation, in order to draw conclusions regarding the effect of multisensory instruction on reading growth. Using three sources of data allowed me to compare the results during and after instruction. The weekly or bi-weekly spelling tests were compared to the Diagnostic Spelling assessment given at the beginning of the year. The pre-tests that were given at the beginning of the study gave me insight into students' prior knowledge of word elements and decoding ability. Photographic evidence was also compared to the detailed notes from my teacher journal. This allowed me to validate my findings and notice trends that occurred with student engagement and their ability to decode and encode multisyllabic words. My teacher research journal also allowed me to reflect on which multisensory strategies seemed to be most engaging. Data results are explained in detail in chapter four.

Chapter 4

Data Analysis and Findings

Chapter four discusses the findings of this study, focusing on the question, “How does multisensory instruction support reading growth for students in fifth grade?” Sub questions included, “How does student engagement increase growth in reading?” “In what ways does morphological awareness support growth in reading?” and “How does multisensory instruction support vocabulary acquisition?” Analysis of data took place in the following areas: pre- and post-assessments on spelling features, decoding abilities, and vocabulary sense, and photographs of student engagement that were cross-referenced with teacher research journal entries.

Throughout the five weeks, students participated in daily activities that included the use of multiple modalities. Each day was dedicated to a different activity. On day one students were explicitly taught the new affix or spelling feature. Then participated in brainstorming known words. On day two students either engaged in a tactile and kinesthetic activity, where they used blocks to manipulate word elements, or they participated in a reading activity, that allowed them to use visual and auditory modalities. On the third day, students applied what they learned during the first two days and practiced spelling dictated words. During this activity students were expected to syllabicate multisyllabic words. On day four, students worked collaboratively in groups to complete a matrix activity. This activity included verbal, auditory, and kinesthetic

modalities, that demonstrated student knowledge of learned word elements. Finally, on the fifth day of the week, students took weekly spelling tests to determine their growth.

Initial reading levels were determined using the Diagnostic Reading Assessment (DRA). Students were assessed prior to this study taking place, to determine if they were reading above, at, or below grade level. This assessment determined students’ oral reading fluency, including number of words read per minute, as well as their comprehension. Initial results are documented in Table 1 below. The five students who participated in this study were all reading below fifth grade or at grade level with a lower comprehension score than their on-level peers.

Table 1
Initial Diagnostic Reading Assessment (DRA) Scores

Student	Independent Reading Level	Oral Reading Fluency	Words Read Per Minute (WPM)	Comprehension
Student One	40	14/16	103	18/24
Student Two	40	12/16	85	17/24
Student Three	40	13/16	105	18/24
Student Four	38	13/16	119	18/24
Student Five	40 (Instructional)	14/16	122	13/24

After careful analysis of all data sources, there are two patterns that have emerged supporting the notion that multisensory instruction supports reading growth. These patterns include the connection between learned morphemes and decoding and encoding

skills, and increased student engagement through encouraging preference of activities and partner and group work.

Over the course of the five weeks, word study and spelling units focused on the following affixes; week one: the root -rupt-, week two: the prefixes pre-, re-, post-, and co-, week three was a review week as students had a week off for the holidays, week four: the suffixes -er, -est, -ed, and -ing, and week five: the roots -leg-, -lig-, and -lect-.

Connections Between Learned Morphemes and Decoding and Encoding Skills

The data showed that all five students made gains in the areas of decoding and encoding (spelling) learned words. Decoding was evaluated in three ways; decoding words in context on the DRA assessment, verbally decoding words in isolation, and dividing words by affixes. Prior to the study, many of the students were not aware of the words prefix, root, and suffix. They were not explicitly taught in the past that these words have meaning and make up many of the words that they see and use on a daily basis. At the start of this study students were assessed on their knowledge of affixes. They had to determine the prefix, root, and suffix of six words. At the end of the study, the same assessment was given to determine growth in affix knowledge. The results of this assessment is charted below (specific analysis of words is included in Appendix A).

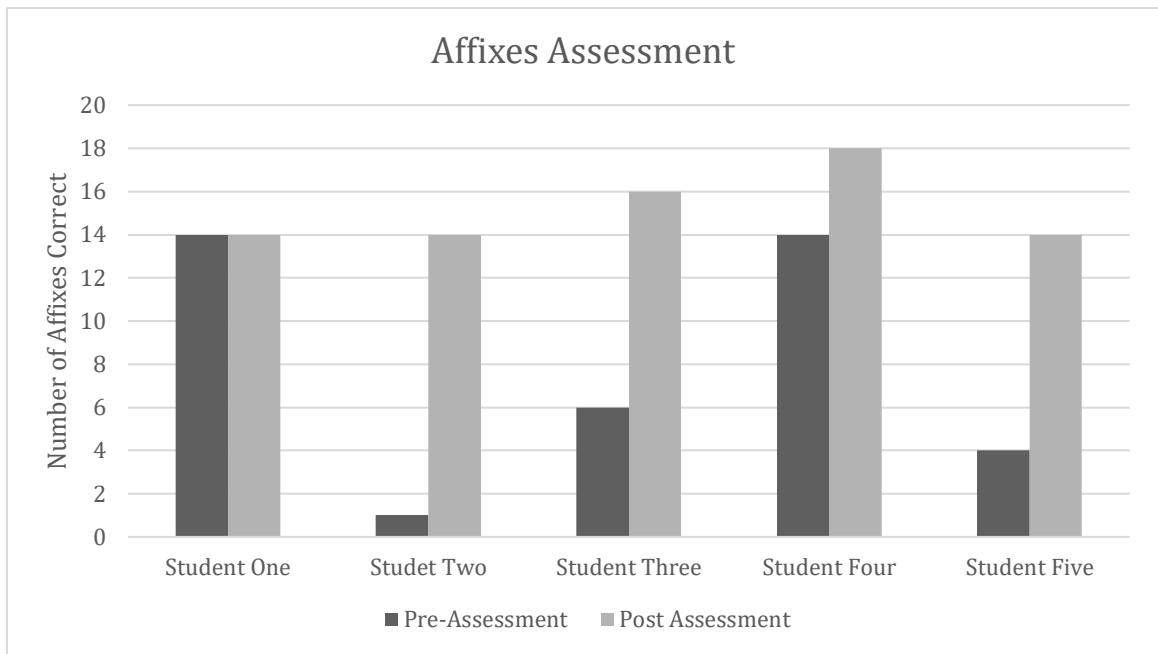


Figure 1. Results from the Pre- and Post- Affix Assessments.

On the pre-assessment student one was able to correctly decode four out of the six words. It is worth noting that two words had a double prefix. Determining two prefixes in a word was not taught during this study, thus if students included it as part of the root word, it was scored as correct. Student one correctly identified five prefixes, four root words, and five suffixes or word endings. On his post - assessment, student one was the only student out of all five that did not make any gains in this area. He decoded all six words the exact same on both the pre- and post- assessment. When looking back on my teacher journal, it was noted that student one was absent three days during the study. This could be a minor indication for his lack of growth in decoding.

Student two showed the most growth on this assessment. On the pre-assessment, he was able to correctly decode one word, while identifying only one suffix. On the post

assessment, student two accurately decoding four words, while identifying 14 affixes, all six prefixes, four roots and four suffixes or word endings.

On the pre-assessment, student three was unable to accurately decode any of the six words. However, he was able to identify all six prefixes. One factor for this occurrence may be that he had prior knowledge of the prefixes that were on the assessment. However, he may not have known how to decode the suffix from the root word. On the post assessment, student three accurately decoded five out of the six words, while identifying 16 affixes, all six prefixes, five roots and five suffixes or word endings. Student three worked daily on the morphological strategy of decomposition that was described by Reed (2008).

Just as student one did, student four also had the highest score on the pre-assessment. He was able to accurately decode four words, identifying all six prefixes, four roots, and four suffixes or word endings. On the post assessment, student four accurately decoded all six words, identifying all 18 affixes.

Student five was able to make some growth in this area of decoding. On the pre-assessment, she was unable to accurately decode any of the six words, however she identified four prefixes. On the post assessment, student five accurately decoded four out of the six words, and identified 14 affixes, five prefixes, four roots, and five suffixes.

In addition to decoding affixes, students were also assessed on their decoding skills on the DRA assessment and verbally decoding words in isolation. When reading words in context on the DRA, results varied. Student one and student five had a decrease

in the number of words read per minute (wpm). Student one had a one-point decrease, reading 103 wpm in the fall, and 102 wpm in the winter. Student five had a significant decrease in words read per minute, reading 122 wpm in the fall and 111 wpm in the winter. When analyzing her results, there is no significant evidence as to why she decreased by so many words. Student two made the largest gains in words read per minute in context. He increased his wpm by 21 words, reading 85 words in the fall and 106 words in the winter. Lastly, student three and student four made gains in their decoding abilities. When reading words in context, student three had an increase of 10 words, reading 105 wpm in the fall, and 115 wpm in spring. Student four increased his wpm by 2, reading 119 wpm in the fall and 121 wpm in spring.

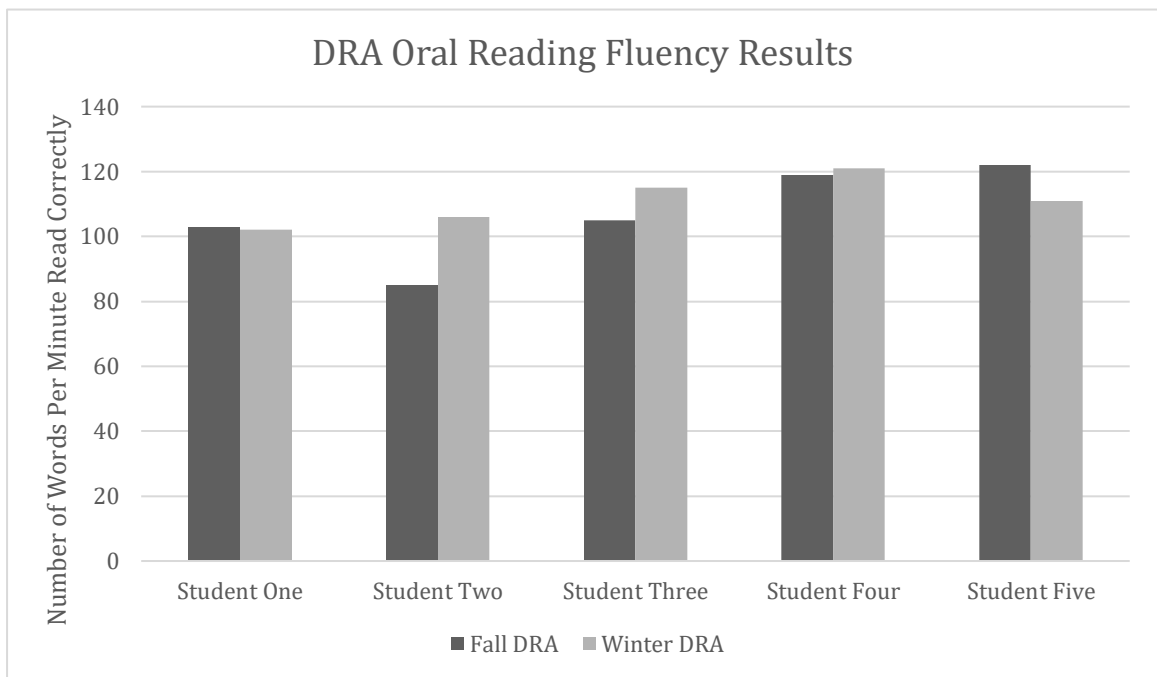


Figure 2. DRA Results.

On the verbal decoding of multisyllabic words in isolation, all five students made gains. This assessment helped to determine if students read words by syllable or by using word elements to decode the words (Wilson, 2017). The pre- and post- results are shown in figure 3 and 4 below. In both assessments, all five students incorrectly read the word chronometer reading it as chrono-meter, rather than chro-nom-et-er. Another word, commonly pronounced incorrectly was quadruped. Students used the root word quad and then attached /ruped/ to the end of it. In contrast, the word biped, stumped most of the students. They failed to see that the word begins with the prefix bi-. Students read this word as bip-ed rather bi-ped. In many of the words on this assessment, students attempted to use the root words to help them decode the whole word. Similar to Pacheco and Goodwin’s (2013) study, all five students used the Parts-to-Whole strategy to decode multisyllabic words.

		Decoding Multisyllabic Words																										
Word to Decode		inscribed	dictatorship	residue	adjacent	dentures	precursor	rehydrate	biped	orthodontist	temporary	unimelleigle	abucted	monochromatic	regression	ruptured	reconstructed	democracy	maturaiton	aquatic	solitaire	chronometer	quadruped	monologue	peridental	tempo	podiatrist	Total incorrect
Student Name																												
Student One		x	x	x								x				x	x		x			x	x		x			10
Student Two		x	x	x	x					x		x	x	x		x	x	x	x		x	x		x	x			16
Student Three										x					x			x	x			x	x					6
Student Four					x					x					x	x		x	x			x	x					8
Student Five		x		x	x		x			x				x	x			x	x			x	x					12
# of students misreading		3	2	3	3	0	1	0	4	0	0	2	1	2	3	2	2	4	5	1	0	5	4	1	2	0	2	

Figure 3. Verbal Decoding of Multisyllabic Words Pre-Assessment.

		Decoding Multisyllabic Words																										
Word to Decode		inscribed	dictatorship	residue	adjacent	dentures	precursor	rehydrate	biped	orthodontist	temporary	unintelligible	abucled	monochromatic	regression	ruptured	reconstructed	democracy	maturallon	aquatic	solitaire	chromometer	quadruped	monologue	periodontal	tempo	podiatrist	Total Incorrect
Student <i>One</i>					x									x								x	x	x	x			6
Student <i>Two</i>		x	x	x	x	x			x					x				x				x	x	x			x	12
Student <i>Three</i>																			x			x	x					3
Student <i>Four</i>					x				x									x	x			x	x					6
Student <i>Five</i>				x	x				x										x			x	x		x		x	8
# of students misreading		1	1	2	4	1	0	0	3	0	0	0	0	2	0	0	0	0	2	3	0	0	5	5	2	2	0	2

Figure 4. Verbal Decoding of Multisyllabic Words Post-Assessment.

Using multisensory strategies to increase morphological awareness supports students grow in their reading abilities. Decoding abilities are a fundamental skill for reading comprehension. Students in the intermediate grades and into middle school benefit from continued instruction in decoding multisyllabic words, (Veenendaal et. al., 2015). Although the five participants in this study showed varied growth in their reading abilities, overall, they showed improvement in their ability to read multisyllabic words.

In this study students used a variety of multisensory strategies to improve on their morphological awareness. By using blocks to manipulate word elements and using syllabication to decode words, students were able expand their knowledge of multisyllabic words which increased their reading abilities. According to Wilson (2017), when students are directly taught written word elements, they are better able to understand word structures and apply their knowledge to decode words.

Multisensory Instruction Supporting Student Engagement

During the five-week study, students participated in a variety of multisensory activities. These activities were consistent each week and helped students to build on prior knowledge. On the first day of each week, students were explicitly introduced to a

new root or spelling feature, then worked together to brainstorm words they knew with that root or spelling feature. On day two students participated in one of two activities, a morphological awareness activity using unifix cubes, or reading and highlighting word lists. On the third day students practiced writing dictated words, chunking them by syllable or by word element. On the fourth day, students worked in groups to create words using pre-made matrices. Lastly, during “Spelling” weeks, students took spelling tests to determine their growth. These spelling tests were then compared to students diagnostic test. During the first week, all activities were completed as a whole class, so that students could become accustomed to the routine.

Levels of engagement were determined to examine student engagement throughout the study. After thorough analysis of my observations and teacher notes, three categories of engagement were determined; highly engaged, engaged, and minimally engaged. Highly engaged referred to times when students were actively thinking about the task, working cooperatively with their partner(s), and comprehending the work they were completing. All similar to parts of the CORI model, created by Guthrie and Wigfield (2010). Engaged was similar to highly engaged, however in this category students may not have fully comprehended the work they were doing, nor were they working cooperatively with their partner. Lastly, minimally engaged referred to times when students were not actively engrossed in the activity. They may have been distracted and off task, and possibly not working cooperatively. Student engagement for each activity is noted in Table 2 below.

Table 2
Number of Students Engaged During Each Multisensory Activity

Activity	Highly Engaged	Engaged	Minimally Engaged
Brainstorming Words	1	4	0
Manipulating Blocks	0	3	2
Reading Word Lists	1	0	4
Word Dictation	5	0	0
Group Matrix	5	0	0

Overall, it was determined that students were engaged during brainstorming activities. When brainstorming words for the root -rupt-, it was noted in my teacher journal that student four “carried the conversation.” He was able to brainstorm the words erupted, interrupt, and rupture. Student three needed prompting to brainstorm a word and was able to do so when told that he can change the suffix of any of the words already said. He was able to add the word erupting and interrupted to their list. Student one and two were partnered together and worked nicely together. They were able to brainstorm seven words together. Student five was partnered with a student that was not part of the study, and was able to brainstorm seven out their twelve words. Through observation, it was noted that student four was most engaged when brainstorming and listing new words at the start of each unit. Through casual conversation, he stated that he likes to “come up with” words he already knows.

During the morphological awareness activity, students were asked to manipulate word parts using blocks. At first students had difficulty with this activity because they wanted to “play” rather than try the activity. Once rules were established, students were

able to succeed at this activity. It was noted in my teacher journal that students had an easier time manipulating morphemes when listening to the words being dictated. They are able to hear where the stress in the word is, thus manipulate the blocks correctly. During the first week, it was noted that student two and five incorrectly manipulated the word chronology. Students were asked to “move the blocks” by syllable. Both students manipulated the blocks to represent “chrono” “ology.” This did show however, that both students were able to determine the root chrono. Similarly, with the word podium, student one, student three, and student five manipulated the blocks to show “pod” “ium” rather than po-di-um. It was determined that students were engaged in this activity. Specifically, it was observed that student four and student five needed several reminders to focus during activities that were kinesthetic (blocks, and matrices). Although they appeared to be motivated by these activities, they were not fully engaged in their learning. Although, it was a good indicator for students’ morphological growth, they were not always working cooperatively.

When reading word lists, it was determined that students were overall minimally engaged. Students kept word lists from all previous taught word study lessons in their notebooks. During this activity their goal was to accurately read words while their peers highlighted the words. If any word was read incorrectly, students were to raise their hand and not highlight the word. It took students three weeks to fully understand and achieve this activity. The goal of this activity was to help students fluently read multisyllabic words. It was noted that during the first attempt at this lesson, students only read four words. Student one, three, and five were able to read three out four words correctly, student two read two out of the four words correctly, and student four read all four words

correctly. According to Morgan et al (2012) tasks should be created “engage the learner in the learning process...” (p. 2). Students did not favor this activity; thus they were not engaged in the learning process. However, for student five, she was most engaged when reading words from her word list. While others read aloud, she was attentive and was able to show improvement each week.

Practicing writing dictated words was deemed a highly engaged activity. Students were given the option to use either a whiteboard, pen and paper, or their laptops (with the spell check off). Giving students these option during this activity, helped to increase student engagement by providing choice. Specifically, student one and student three were most engaged during this activity. When working alone, they were able to concentrate and focus. Although, they enjoyed working with partners, it was observed, as evidence from my teacher journal, that both boys were attentive when words were being said, and corrected their mistakes if they felt they had made any.

Lastly, students participated in a matrix activity. Students were given notecards that had prefixes, roots, and suffixes already learned, including the feature root for that week. By using notecards, this activity became kinesthetic, rather than just visible. With partners students had to “build” as many words as they could and chart them. It was determined that students were highly engaged during this activity and wanted to be the team that built the most words (See figure 5).



Figure 5. Students Highly Engaged in Matrices.

On day five of week four, it was stated in my teacher journal that, “students quickly partnered up and moved to a location of the classroom to work. Student two expressed a leadership role by placing the cards out and building his first word. He asked his partner to chart the word he created and told him that he will do the same for him.” As student two became more confident with the activities, his leadership skills really emerged, thus becoming more engaged in his learning.

The data indicates that students are motivated to learn in different ways. Using a variety of multisensory strategies helps students to become engaged in their own learning, thus showing a growth in their reading abilities. Overall, reading gains were not tremendous, however all five students improved their decoding abilities, which is a factor to their overall reading growth.

The purpose of this study was to investigate how multisensory instruction supports growth in reading for students in fifth grade. By analyzing the data, I collected over the course of five weeks, I was able to determine that including activities that were

comprised of more than one modality increased student's decoding abilities and reading engagement. The data suggests that engaging students in instruction on morphological awareness, using multisensory strategies, increased reading performance.

Chapter 5

Conclusion

Summary of the Findings

This study set out to answer the research question that asked, “How does multisensory instruction support reading growth for students in fifth grade?” An analysis of data revealed that multisensory instruction supports reading growth for students in fifth grade. The study was conducted over the course of a five-week period using multisensory instructional strategies during our word study and spelling block. The participants in this study consisted of five students in my language arts class. I analyzed and compared multiple qualitative data sources through a process of triangulation to determine patterns emerging from the data. Using pre- and post- assessments, photographic evidence, and my teacher research journal, two patterns emerged that support the concept that multisensory instruction supports reading growth for students in fifth grade.

First, a connection was formed between learned morphemes and the ability to decode and encode. During this study, students began to decipher between affixes. A factor that became evident throughout the study was that students were able to decode and encode throughout the various forms of instruction. Although the students in this study demonstrated varied growth in their oral reading fluency, overall, they improved in their ability to read multisyllabic words.

Students used a variety of multisensory strategies to improve on their morphological awareness. They expanded their knowledge of multisyllabic words, by using blocks to manipulate word elements and using syllabication to decode words.

The second pattern was to increase student engagement through the encouragement of creating a preference of activities, along with partner and group work. Using similar parts of Guthrie and Wigfield's (2010) CORI model, student engagement was deemed as highly engaged, engaged, and minimally engaged. The data indicates that each of the five students were highly engaged in a variety of multisensory strategies. This is an indication that students are motivated to learn in different ways, and as stated previously, students are engaged in their own learning when presented with a variety of multisensory strategies to engage with.

Conclusions of the Study

At the conclusion of the study, it was determined that incorporating multisensory instruction improves areas of reading. By utilizing multisensory strategies, students demonstrated an increase in their engagement and their ability to apply learned skills in decoding and encoding multisyllabic words. Active participation stimulates brain growth, (Springer, 1999). Engaging students in various modalities helps to ensure retention. Although a direct correlation in student growth could not be determined from my research, the data suggests that including multisensory techniques does not harm student growth in reading. Oral reading fluency scores varied amongst the five participants, however, all students showed growth in their ability to decompose word elements.

Campbell et al (2008) suggests that incorporating multisensory elements simultaneously through visual, auditory, and kinesthetic approaches, improves students' memory and learning. At the word level, students can increasingly be able to decode words and thus becoming more fluent readers.

Limitations of the Study

Throughout the study, there were some key factors that limited the study. The biggest factor being time. This study was only conducted over a period of five short weeks, with a winter break right in the middle of the five weeks. If given more time, such as an entire academic year, student growth may have been more evident and I may have been able to make more of a direct correlation between student reading growth and the incorporation of multisensory strategies.

Another limitation to this study is the number of participants that data was gathered on. Five students from a fifth-grade general education setting were chosen for this study. The five students were reading at or below grade level. Although an abundant amount of data was gathered on these five students, it may be beneficial to implement a study that compares the level of growth amongst readers at various reading levels, and grade levels. Additionally, many studies have been conducted that examine the effects of multisensory instruction in small primary grade groups. A comparative study amongst primary and intermediate grades could shed more light on the effect that multisensory instruction may have on students in the upper grades.

Lastly, the types of multisensory strategies used was a limitation. Although a variety of techniques were implemented, there are several others that could have been incorporated during instruction. Perhaps more student choice could have affected the outcomes of this study in both reading growth and student engagement.

Implications for the Study

Continued research on the effects of multisensory instruction on reading growth could benefit teachers, students, and researchers in the field. Further research could compare the level of growth over the course of different grade levels with the use of a variety of multisensory techniques. Implementing a study with more students, may be beneficial in determining if similar trends emerge, as well as growth in all areas of reading. While some short-term effects of multisensory instruction were developed through this research study, researchers may be able to determine additional long-term effects.

Further research would add to the reliability of past studies that connect all areas of reading. Additionally, extending the use of multisensory strategies across other content areas will give researchers additional evidence of the effects of multisensory instruction. Phonics, spelling, and reading are interconnecting concepts. Using multisensory techniques in the classroom can be an effective tool to make gains in these areas, while encouraging student engagement.

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Appendix A

Student's Pre- and Post- Affix Assessments

Figure A1. Student One Pre- and Post- Affix Assessments.

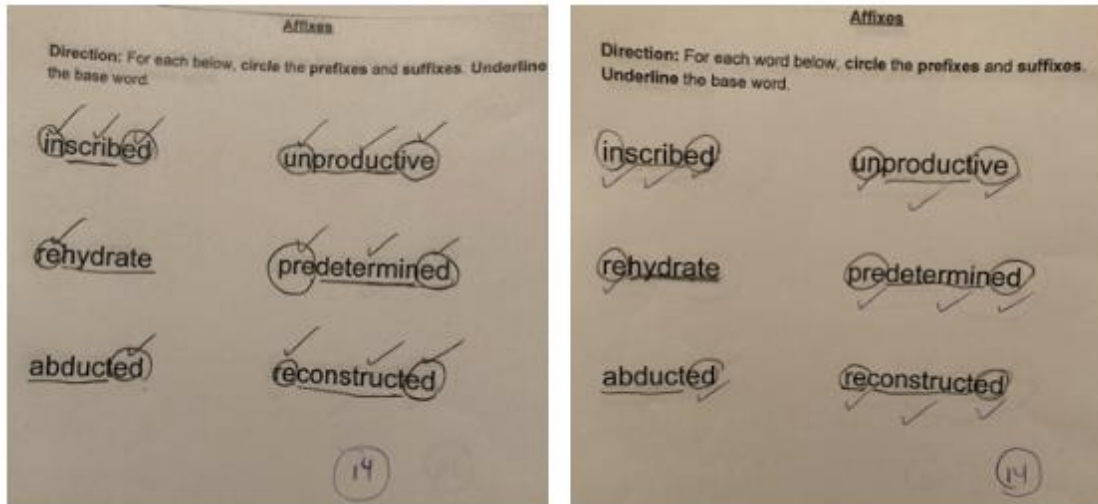


Figure A2. Student Two Pre- and Post- Affix Assessments.

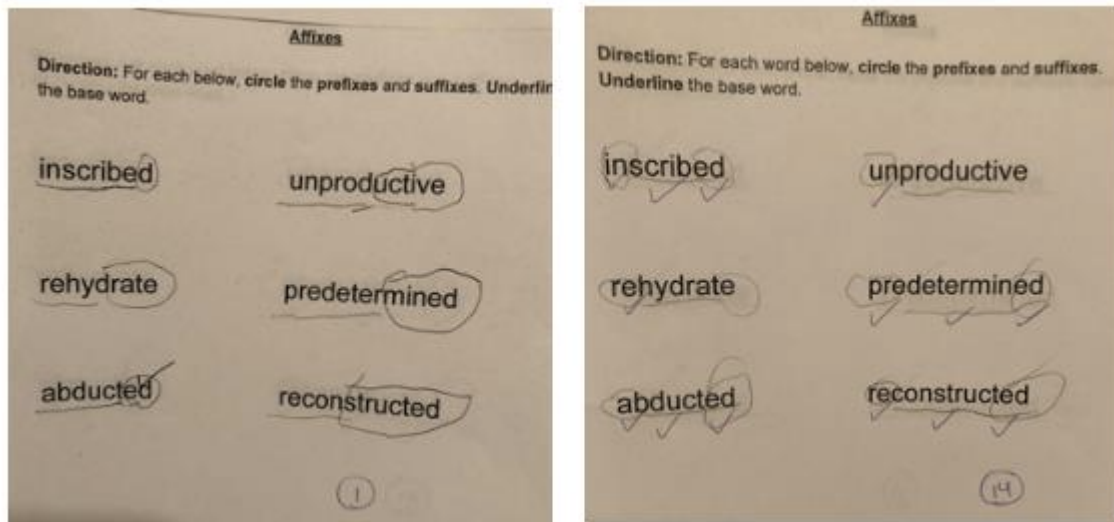


Figure A3. Student Three Pre- and Post- Affix Assessments.

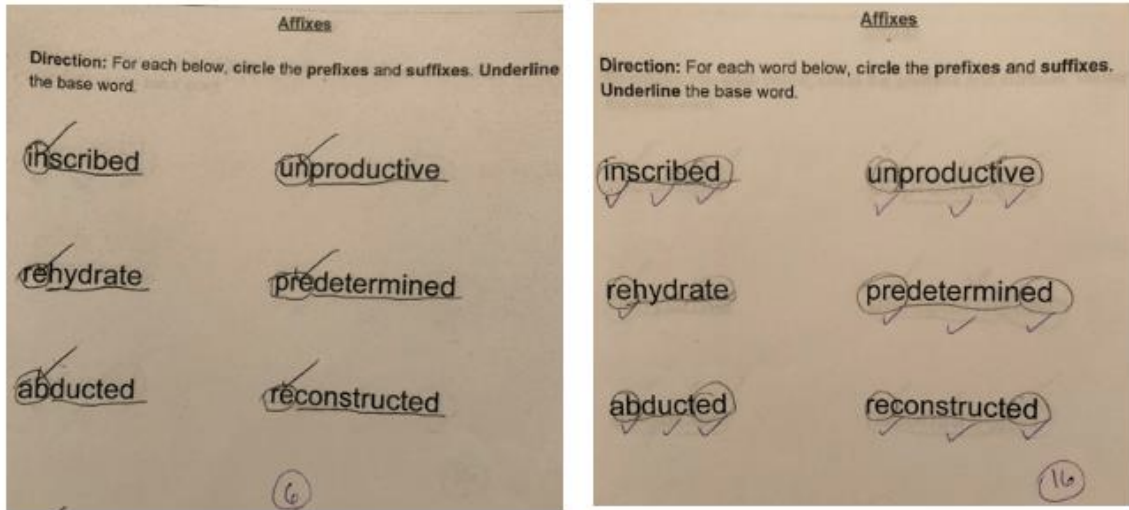


Figure A4. Student Four Pre- and Post- Affix Assessments.

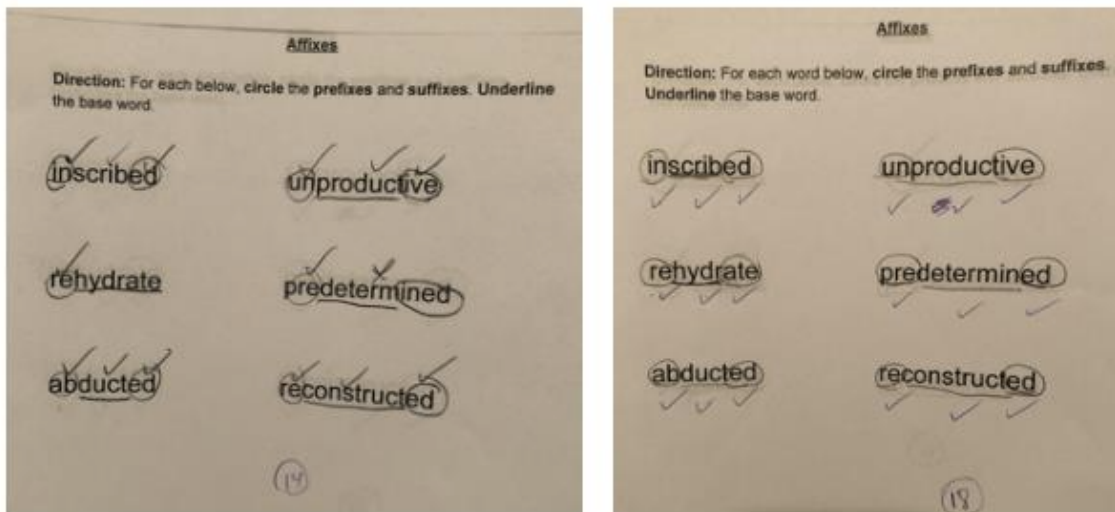
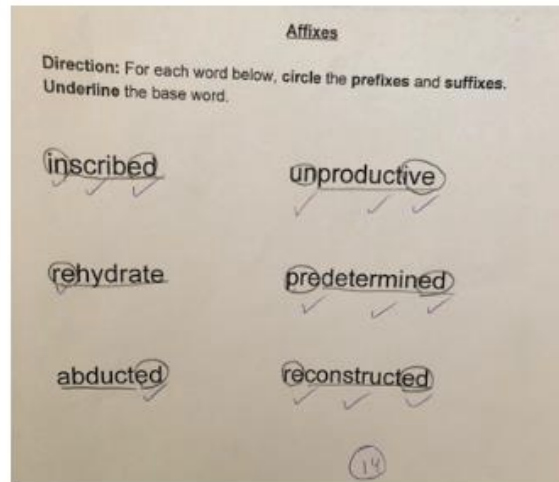
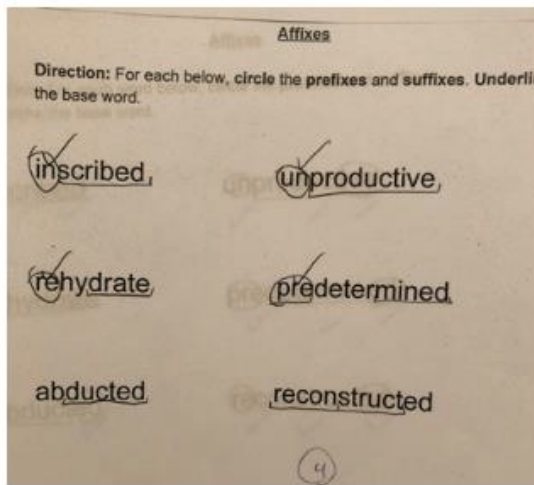


Figure A5. Student Five Pre- and Post- Affix Assessments.



Appendix B

Verbal Decoding of Multisyllabic Words

Figure B1. Pre-Assessment.

		Decoding Multisyllabic Words																										
Word to Decode		inscribed	dictatorship	residue	adjacent	dentures	precursor	rehydrate	biped	orthodontist	temporary	unintelligible	abducted	monochromatic	regression	ruptured	reconstructed	democracy	maturation	aquatic	solitaire	chronometer	quadruped	monologue	periodontal	tempo	podiatrist	Total Incorrect
Student Name																												
Student One		x	x	x								x				x	x		x				x	x		x		10
Student Two		x	x	x	x				x			x	x	x			x	x	x	x		x		x	x		x	16
Student Three									x						x			x	x			x	x					6
Student Four					x				x						x	x		x	x			x	x					8
Student Five		x		x	x		x		x					x	x			x	x			x	x				x	12
# of students misreading		3	2	3	3	0	1	0	4	0	0	2	1	2	3	2	2	4	5	1	0	5	4	1	2	0	2	

Figure B2. Post-Assessment.

		Decoding Multisyllabic Words																										
Word to Decode		inscribed	dictatorship	residue	adjacent	dentures	precursor	rehydrate	biped	orthodontist	temporary	unintelligible	abducted	monochromatic	regression	ruptured	reconstructed	democracy	maturation	aquatic	solitaire	chronometer	quadruped	monologue	periodontal	tempo	podiatrist	Total Incorrect
Student Name																												
Student One					x									x								x	x	x	x			6
Student Two		x	x	x	x	x			x				x				x					x	x	x		x		12
Student Three																			x			x	x					3
Student Four					x				x								x	x				x	x					6
Student Five				x	x				x									x	x			x	x		x		x	8
# of students misreading		1	1	2	4	1	0	0	3	0	0	0	0	2	0	0	0	2	3	0	0	5	5	2	2	0	2	