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ISABELLE FARRINGTON COLLEGE OF EDUCATION

April 24, 2018

This is to certify that the action research study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions as required by
CT Literacy Specialist Program have been made.

College of Education

Department of Leadership and Literacy

EDR 692 - Applied Reading and Language Arts Research

**ABC: It's as Easy as 1, 2, 3 – The Importance of a Multisensory Approach in
Phonological Awareness Instruction**

Advisor: Dr. Karen C. Waters

Abstract

Currently, more than 20% of kindergarten and first grade students struggle with an aspect of phonological awareness. Further, 80% of struggling readers exhibit weaknesses in phonological processing, which is the basis for grappling with unfamiliar words. Students whose reading achievement is not at grade level by third grade are at risk for not catching up to their more-capable peers. Using social constructivism as the theoretical framework in this action research study, we examined the effect of a multisensory, explicit, and systematic approach in phonological awareness for students in the primary grades. From the larger school population, this study focused on eight specific students in first grade. The structured program, *foundations*, was implemented throughout the eight week intervention period. Students learned skills to support their ability to decode unknown words through a sequential set of phonics elements in a multisensory approach. Instrumentation included the Gallistel-Ellis Test of Coding Skills, and STAR Early Literacy, which were used for pre and post measures in the fall and again in the winter after the eight week period. Students' ability to decode consonant-vowel-consonant words increased from an average of 11 words to 21.5 words, and students' mean score in phonemic awareness increased from 56% to 81% through pre and post testing. Thus, results showed that early intervention using a multisensory approach was effective in providing students strategies to decode unfamiliar words while reading grade level texts.

Keywords: Phonological Awareness, multisensory approach, whole group and small group instruction, phonics, primary grades, structured literacy

Table of Contents

List of Tables	2
Section 1: Introduction to the Study	4
Background of the Study	5
Rationale	6
Problem Statement	7
Solution	7
Theoretical Perspective.....	8
Research Questions.....	9
Section 2: Review of Literatruue	Error! Bookmark not defined. 10
Historical Perspective on Reading	Error! Bookmark not defined. 10
Social Constructivist	Error! Bookmark not defined. 10
Zone of Proximal Development.....	Error! Bookmark not defined. 11
Scaffolding	Error! Bookmark not defined. 12
What is Phonological Awareness?.....	Error! Bookmark not defined. 13
What is Phonemic Awareness?.....	Error! Bookmark not defined. 13
Structured Literacy.....	13
The Issue of Time Management	15
Multisensory Approach	Error! Bookmark not defined. 15
Principles of Phonological Awareness.....	17
Conclusion	18
Section 3: Methodology	20

Introduction.....	20
Participants.....	20
Materials	21
Procedure	23
Section 4: Data Collection and Analysis	24
Section 5: Discussion, Recommendations, Conclusion.....	27
Findings and Interpretations for Research Question 1.....	27
Findings and Interpretations for Research Question 2.....	28
Findings and Interpretations for Research Question 3.....	28
Recommendations for Action	29
Recommendation for Further Study.....	30
Conclusion	30
References.....	32
Appendix A: Graphs, Tables, and Instruments.....	37

Section 1: Introduction to the Study

In a landmark study, children in October, in the three most able groups read a mean of 12.2 words; while the children in the two least able groups were not able to read (Stanovich, 1986). Then in April, the most able group read a mean of 81.4 words, yet the two least able groups read 31.6 words. Despite efforts to improve reading standards, the gap does not seem to be closing (Carson, et al., 2013), causing the Matthew Effect; a “reading achievement gap between good and poor young readers” (Carreker, et al., 2007, p.188). Students who are able to successfully decode words and are motivated to read often will develop larger knowledge bases, whereas students who struggle to decode words and read fewer words will have smaller knowledge bases because they are exposed to less text than their peers (Carreker, et al., 2007; Stanovich, 1986). A structured literacy program of phonological awareness is essential if the goal is to increase the percent of students having phonological and alphabetic skills (Goldstein et al, 2017; Toste et al, 2014; At Otaiba, 2009).

In schools across America, students are expected to read and comprehend at an earlier age; however, up to one in three children have difficulty with the achievement of basic reading and writing skills (Carson, et al., 2013). At least twenty percent of children have difficulty mastering the skills required to become proficient readers; while eight to ten percent of kindergarteners exhibit significant delays (Toste et al., 2014; Trehearne, 2003). Phonological Awareness (PA) is students’ explicit awareness of the sound structure of spoken words and the ability to distinguish the sounds (Kaminski & Powel-Smith, 2016; Eissa, 2014; Yopp & Yopp, 2000) in rhymes, syllables in words, and individual phonemes in syllables. Since the 1980s, researchers have identified the lack of phonological processing as one reason students have

reading difficulties because students lack the awareness that words are created by a variety of sound units (Eissa, 2014).

Phonemic awareness instruction is important in the development of successful readers and needs to be a priority in the primary grades because students must be able to decode unfamiliar words as they read, and be engaged readers (Ghoneim & Elghotmy, 2015; Sparks et al., 2014). It is important for students to be able to read and comprehend because “reading is the prerequisite skill for success in all other academic areas” (Eissa, 2014, p. 69).

Background of the Study

According to Stanovich (1986) and Kaminski & Powell-Smith (2016), phonological awareness stands out as the highest predictor of reading acquisition. Phonological Awareness (PA) is the process in which students learn that words are made up of phonemes (sounds) and learn each individual phoneme (Eissa, 2014). PA is the ability to recognize rhymes, counting syllables, and separating the beginning sound from the ending sound (e.g. /c/ from /at/) (Yopp & Yopp, 2000). More than 20% of kindergarten and first grade students struggle with an aspect of PA; furthermore eight to ten percent show significant delays (Trehearne, 2003).

PA is causally related to the early development of reading skills because students must be able to decode when they are reading; they know the phonemes in an unknown word and can produce the phonemes fluently (Stanovich, 1986). Students who exposed to reading at home, and at school are already developing PA. These students will be more skilled readers than students who are not exposed to print early on (Baker, 2007; Carreker, et al., 2007; Stanovich, 1986) because they have already built a foundation; whereas the less skilled readers are playing catch up.

Phonemic awareness, a subset of PA (Yopp & Yopp, 2000), is the ability to hear the sounds in words and isolate those sounds (Eissa, 2014). For example, students understand the difference between “dog” and “hog”, and can identify the three sounds in the spoken word “cat”, /c/-/a/-/t/ and in “fish”, /f/-/i/-/sh/ (Yopp & Yopp, 2000). The National Reading Panel determined that phonemic awareness is one reading subskill that predicts reading success and is a the foundation for decoding and word recognition (2000).

Stanovich (1986) found that early skill of phonological awareness leads to “superior reading achievement” (p. 363). In order to help students become successful, fluent readers who are able to comprehend the story, teachers must provide high-quality, engaging, and meaningful PA instruction in primary grades throughout the day.

Rationale

There are over 15 million children in kindergarten through third grade and their success depends on the literacy program they were taught in those primary grades. Students who acquire adequate pre-reading skills during their kindergarten year are more likely to be successful readers in third grade, and third grade students who are successful readers are more likely to graduate than students who are not successful readers (Ross et al., 2015).

Early effective literacy focuses on PA, and decoding skills (Carreker et al., 2013). In order to increase students PA, teachers must first understand the components of a multisensory PA program. Children need to acquire PA if they are to successfully progress in reading because they will be able to independently decode (Carreker et al., 2013; Stanovich, 1986). Furthermore, students who develop strong decoding skills, engage in more reading, which in turn exposes them to more print, enabling them to develop vocabularies and comprehension skills compared to their less skilled peers (Sparks et al., 2014; Stanovich, 1986).

Teachers are aware of the importance to teach PA in the primary grades; however, they often rely on the same instructional strategies (O'Rourke et al., 2016). These strategies often fail to meet the diverse needs of learners, the one size fits all does not work (O'Rourke et al., 2016). This project will demonstrate the reasons why PA is crucial in reading success and explore how a multisensory PA program can enhance classroom instruction and student learning.

Problem Statement

More than 20% of kindergarten and first grade students struggle with an aspect of PA; furthermore eight to ten percent show significant delays (Trehearne, 2003). Students who exhibit poor phonemic awareness have a greater probability struggling with reading altogether (Cassar, et al., 2005). Further, 80% of struggling readers exhibit weaknesses in phonological processing, which is the basis for grappling with unfamiliar words (Cassar et al., 2005). Students whose reading achievement is not at grade level by third grade are at risk for not catching up to their more-capable peers.

Solution

One of the national, state, and district-wide goals for students in kindergarten through 2nd grade is to develop PA (NGA & CCSSO, 2017). PA is the ability to know and manipulate the “sound structure of spoken words at the syllable, onset-rime, and phoneme levels” (Carson et al., 2013). The Common Core State Standards (CCSS) states “. . . the first three years of instruction are the most critical for preventing students from falling behind and preventing reading failure” (NGA & CCSSO, 2017).

In 1997, the National Reading Panel, worked to evaluate existing research to find the best ways to teach children how to read. Through their evaluation, the panel determined a way to

teach reading that incorporates explicit reading instruction in phonemic awareness, and systematic phonics instruction is the best approach (NICHD, 2000; Giess et al., 2012). The National Reading Panel found teaching phonemic awareness to students “significantly” improved their reading more than instruction that lacked phonemic awareness (2000).

Therefore, research needs to be carried out in order for teachers to understand how to provide a multisensory PA, which includes tapping out sounds, touching each letter tile, finger-spelling, and visualizing (Giess et al., 2012) within the literacy block to promote reading achievement of struggling primary students.

Theoretical Perspective

This study reports on the impacts of a multisensory, explicit, and systematic approach to teach phonological awareness to prevent reading difficulties for students in primary grades. Phonological programs that are explicit and systematic prevent reading difficulties for most children (Al Otaiba, 2009). This model draws on Lev Semionovich Vygotsky’s social constructivism theory, that children learn through interactions with others (Vygotsky as cited by Tracey & Morrow, 2006). He argued that “children’s learning is most affected by their mastery of language” shown through their mastery of the alphabet, words, listening, speaking, and writing (Vygosky as cited by Tracey & Morrow, 2006). As Yopp and Yopp discussed, phonemic awareness instruction should be playful and engaging through social interactions (2000).

Vygotsky’s theory of constructivism includes the Zone of Proximal Development; “the ideal level of task difficulty . . . at which a child can be successful with appropriate support” (Vygotsky as cited by Tracey & Morrow, 2006, p. 109). The “one size fits all” approach does not allow students to reach their full development (O’Rourke et al., 2016, p. 4).

Research Questions

Phonological awareness (PA) is the vast body of knowledge that comprises prerequisite foundational skills for emergent reading and writing (Cunningham & Stanovich, 2001).

Researchers maintain that the essence of explicit phonics instruction -- the relationship between the sounds or phonemes of spoken language and the graphemes or letters of written language, should be as necessary, deliberate, and strategic as the comprehension instruction that follows (Carson et al., 2013). The following research questions will frame the study.

1. What are the effective strategies for teaching phonological awareness?
2. What are the effects of a multisensory phonics program on struggling students?
3. What impact does a multisensory phonological awareness program have on the future reading achievement of struggling primary students?

Review of Literature

Historical Perspective on Reading

Early reading experiences provide children exposure to oral language, and vocabulary; while developing their background knowledge and comprehension. The more students are exposed to reading, the stronger readers they become (Carreker et al., 2007; Sparks et al., 2013; Stanovich, 1986); however, research has determined at least 20% of children have difficulty mastering certain skills needed to become proficient readers (Toste et al., 2014). Classroom teachers need to provide effective reading instruction to ensure students become proficient readers (Carson et al., 2013). It is imperative students develop the necessary foundational reading skills to become proficient readers because students who struggle with reading in the primary grades “are likely to struggle with reading throughout their school years” (Toste et al., 2014 p. 192; Gonzalez-Valenzuela & Martin-Ruiz, 2017).

Cunningham, Stanovich (2001) and other researchers have agreed that phonological skills are the foundation for learning to read and write (Al Otaiba et al., 2009; Carson et al., 2013; Duff et al., 2011; Stanovich, 1986). PA knowledge supports students understanding between phonemes (sounds) and graphemes (letters), which develops their word decoding ability and furthermore, their reading comprehension (Carson et al., 2013). Students who develop strong decoding skills engage more in reading, which introduces them to more print, enabling students to develop vocabulary and comprehension skills (Sparks et al., 2014).

Social Constructivist

Lev Semionovich Vygotsky developed the theory of social constructivism, the belief that children learn through their interactions with other children (Vygotsky as cited by Tracey & Morrow, 2006). The social constructivist approach informs this study because children learn PA

through a multisensory, explicit, and systematic approach where children interact with others (Al Otaiba, 2009; Vygotsky as cited by Tracey & Morrow, 2006). Two key ideas in Vygotsky's social constructivism is the zone of proximal development and scaffolding (Vygotsky as cited by Tracey & Morrow, 2006).

Zone of Proximal Development

Zone of proximal development refers to differentiation within the classroom setting; “the ideal level of task difficulty . . . at which a child can be successful with appropriate support” (Vygotsky as cited by Tracey & Morrow, 2006, p. 109). Children who enter school without a lot of authentic opportunities to engage in the act of reading practice benefit from a structured literacy program and plenty of opportunities to practice their decoding skills; whereas children who enter with a lot of reading opportunities will benefit from whole language approach (Ryder et al., 2007). Ryder's intention was to say that not all students will benefit from the same instruction. Differentiation of instruction is one way teachers can address the diverse needs of all the learners in their classroom (Walet, 2011).

Juel and Minden-Cupp (2000) compared instruction and data between four-first grade classrooms in the fall, winter, and spring. The researchers found that the fourth classroom had considerable differentiation across the three leveled groups within the classroom, and had the highest success overall for the low group. The lowest group in classroom four, had a mean score of 91.3% word recognition on the end of year assessments as compared with the low group in the second classroom with a mean score of 86.7% word recognition on the end-of-year assessments. Classrooms one and three were not asked to participate on the end-of-year assessments, because the students in the classes continued to perform at the frustration level on the primer level passages.

Scaffolding

Scaffolding refers to the amount of assistance adults and peers provide during a lesson (Vygotsky as cited by Tracey & Morrow, 2006). Teachers provide the explicit teaching, and modeling that allows children to complete the activities independently (McGee & Ukrainetz, 2009). Before teachers begin, they need to determine what kind and how much assistance is needed for each child to be independent with the skill, as well as, internalize the skill (2009). Scaffolds are the comments and instructions teachers provide to give more guidance for answering the question correctly about the skill (2009).

In a study of preschool children where scaffolding was part of teaching phonemic awareness, 75% of the preschool children entered kindergarten being able to isolate seven or more of the ten beginning sounds in words (McGee & Ukrainetz, 2009). By the middle of the kindergarten year, more than half of the students could segment a consonant vowel consonant (CVC) word (2009). When teachers used scaffolds accurately during instruction, the kindergarten children made progress developing complex levels of phonemic awareness (2009).

In Juel and Minden-Cupp's (2000) study, they mention that the teacher in classroom four did a lot of modeling while using the phonics curriculum. The teacher modeled how to segment words into onset and rime chunks, and how to blend individual letter-sounds to recognize a word. Scaffolding the activities proved important because at the end of first grade, classroom four read a mean of 91.3 words on the passage, while classroom one was asked not to read the end of first grade passages because they were at the frustration level on the primer level (Juel & Minden-Cupp, 2000). This shows that when teachers use scaffold questions students learn more because teachers provide the right guidance to answer and learn the skill.

What is Phonological Awareness?

Phonological Awareness (PA) is the ability to hear and produce the sounds of the spoken word through segmenting and blending words, syllables, or phonemes (Goldstein et al., 2017; Carson et al., 2013). Before students can become successful readers, they need to understand that words are composed of letters and those letters make certain sounds (Al Otaiba et al., 2009; O'Rourke et al., 2016); for example, “cat” has 3 sounds /c/-/a/-/t/, while “stop” has 4 sounds /s/-/t/-/o/-/p/. PA highly predicts the ease in which children learn to read as well as their reading ability later on in life, due to successfully decoding unknown words (Kaminski & Powell-Smith, 2016; Stanovich, 1986). Early readers benefit from an explicit, systematic approach to develop their PA (Al Otaiba et al., 2009; Giess et al., 2007; Gonzalez-Valenzuela & Martin-Ruiz, 2017; Lim & Oei, 2015; O'Rourke et al., 2016; Ryder et al., 2007).

What is Phonemic Awareness?

Phonemic awareness, a subset of PA, is the “ability to distinguish the individual sounds in words” (Mesmer & Williams, 2014); students can identify and produce the three sounds in “fish”, /f/-/i/-/sh/ or can blend the phonemes /h/-/o/-/g/ to form the word “hog” (Yopp & Yopp, 2000). Students require the knowledge of phonemic awareness before being introduced into phonics because they understand “running speech” consists of a sequence of small sounds (Yopp & Yopp, 2000, p. 131). Phonemic awareness instruction should be multisensory, interactive, and stimulate curiosity (Yopp & Yopp, 2000).

Structured Literacy

Developing a successful PA program during the literacy block has been an area of concern for teachers. A structured literacy program includes a comprehensive curriculum with a sequential set of phonics elements in a multisensory approach (Eissa, 2014; Ghoneim &

Elghotmy, 2015; Goldstein et al., 2017; Lim & Oei, 2015; Vaden-Kiernan et al., 2016; Wise et al., 2015). Teachers work to ensure the structured literacy program teaches the “key predictors” of early literacy success; specifically phonological awareness (Carson et al., 2013, p.150). A structured literacy program that provides explicit and systematic teaching can prevent reading difficulties in most students (Al Otaiba et al., 2009) because students develop their PA through their development of phonemic awareness.

Carson et al. (2013) explored the impact of explicit phonemic awareness instruction in 251 British schoolchildren for two years. At the end of the study, the percent of students who had been identified as having a reading disorder was reduced from 20% to 5% among those who received the explicit phonemic awareness instruction (Carson et al., 2013). Carreker et al., (2007) found that 17.13% of students who did not receive the Language Enrichment (LE) program in first or second grade, fell at or below the 10th percentile as compared with 9.6% of students who did receive the LE program in first or second grade.

Juel and Minden-Cupp (2000) found that students in the lowest reading group benefited from a systematic, explicit phonics teaching, but not for a whole year. Eventually, students need to progress into the whole language approach. Juel and Minden-Cupp (2000) found that children who entered first grade with limited phonological awareness required “a heavy dose of phonics” (p. 484). The differentiated instruction evened out in the spring and systematic phonics instruction was completed in February for the first graders with limited phonological awareness (Juel & Minden-Cupp, 2000).

Early reading experiences can be affected by the lack of daily exposure to reading as well as texts that are too difficult to understand (Stanovich, 1986; Cunningham & Stanovich, 2001). Biemiller (1978) found that reading differences emerged as early as the middle of first grade. In

October, the children in the three most able groups, read a mean of 12.2 words in a session, and by April, read a mean of 81.4 words in a session; compared with the children in the two least able groups, were not reading in October, and by April, were reading a mean of 31.6 words in a session (Stanovich, 1986). Students who have difficulty in their early reading experiences have less involvement in reading and read less while in school (Stanovich, 1986). The lack of exposure the less skilled reader has to a text “delays the development of automaticity and speed at the word-recognition level” (Stanovich, 1986; Cunningham & Stanovich, 2001, p.137) causing them to rely heavily on their decoding skills.

The Issue of Time Management

It is important for teachers to understand how to effectively and efficiently integrate PA activities into everyday instruction (Carson et al., 2013). Effective phonics instruction can be taught in no more than 15 to 20 minutes a day (O'Rourke et al., 2016). Carson and colleagues (2013) revealed that effective phonics instruction was delivered in under sixty minutes per week. In one study of 404 five year olds, teachers provided instruction in one of three ways: PA and word decoding, PA only, or the usual literacy curriculum in three 15 minute sessions per week. The group that received instruction in PA and word decoding outperformed the children in the PA only group, and the group that received the usual literacy curriculum on reading and spelling tasks (Cason et al., 2013).

Multisensory Approach

The multisensory approach provides “multiple pathways for learning” (Wale, 2011, p. 85). PA instruction should be playful, engaging, interactive and social; it should create curiosity and experimentation with language (Yopp & Yopp, 2000). The multisensory approach to PA instruction involves auditory and visual feedback for sounds, and kinesthetic/tactile input of

letter formation (Giess et al., 2012; Lim & Oei, 2015; Walet, 2011). For example, students might tap each of the phonemes in the word “hope” (Yopp & Yopp 2000).

Giess et al. (2012) used the Barton Reading and Spelling System (BRSS), a multisensory program in their study of nine ninth through eleventh graders examining how a supplemental reading instruction program would increase their reading skills. The BRSS stimulates multisensory instruction by appealing to students’ visual, auditory, tactile, and kinesthetic senses. Students learned how to tap out vowel sounds while saying the sound and keyword, touching each letter tile and saying the corresponding sound, finger-spelling words while saying corresponding sounds, and visualizing the sight word (Giess et al., 2012). Based on pretest and posttest data, students receiving this instruction showed an increase in their word attack skills. The students’ mean scores in word attack increase from 76.78 to 88.47 (Giess et al., 2012). The BRSS was effective in improving the word recognition and spelling abilities for the nine students.

Campbell and researchers (2008) analyzed the effects of adding multisensory elements to a phonics program on reading achievement of six second grade students. The students received 20 phonics lessons from *Early Reading Tutor* (ERT), an explicit, systematic supplemental reading program. The multisensory component of the intervention required that the student sit on the carpet, state the sound, and tap out the letter sounds of the word using the non-dominant hand (Campbell et al., 2008). The results indicated an increase in students’ ability to fluently decode vowel consonant (VC) and consonant vowel consonant (CVC) nonsense words when multisensory components were added to the ERT (Campbell et al., 2008).

Joshi et al., (2002) studied whether a multisensory phonics program, *Language Basics: Elementary*, would improve reading skills of a group of first grade students as compared with the

current phonics program, *Houghton-Mifflin Basal Reading Program*. There were 32 first graders in the control group and 24 first graders in the experimental group (Joshi et al., 2002). On the phonological awareness test, the control group had a mean growth of 2.96 from pretest to posttest, as compared with the experimental group that had a mean growth of 9.29 from pretest to posttest. On the decoding test the control group had a mean growth of 4.25 from pretest to posttest and the experimental group had a mean growth of 13.56 from pretest to posttest (Joshi et al., 2002). This shows that the first graders who were taught using the multisensory teaching approach performed better on the tests compared to the control group (Joshi et al., 2002).

Principles of Phonological Awareness

It is important for students to recognize and manipulate sounds in words and to associate the sounds of the letters (Al Otaiba, 2009; Carson, 2013; Eissa, 2014; “Foundational Skills,” 2016). Since the 1980s, researchers have identified the lack of PA as one reason students have reading difficulties because students lack the knowledge that words are created by a variety of sound units (Eissa, 2014). The three different levels of PA within words are syllables, onsets-rimes, and phoneme awareness (Trehearne, 2003).

To begin teaching PA to students, it is best to introduce students into larger segments of speech and then move towards smaller sound segments, words can be broken into syllables, which is a segment of a word (“Foundational Skills,” 2016). For example, “cat” has one syllable, and “hotdog” has two syllables. Students can practice hearing syllables in words by putting up a finger for each segment they hear or by clapping each segment (2016).

After students are able to break words into syllables they can move on to even smaller units within a syllable called onsets and rimes (“Foundational Skills,” 2016). An onset is the initial consonant(s) and the rime consists of the vowel and any consonants that follow after

(2016). For example, /d/ in “dog” is the onset and /og/ is the rime. Students can practice separating words into onset and rime using alphabet cards (2016).

Once students are able to separate words into syllables, and onset and rime, they are ready to isolate and manipulate individual phonemes known as phonemic awareness (“Foundational Skills,” 2016). For example begin with simple two or three phoneme words such as “sun,” “dog,” “dig,” and “at” (2016). Students can use Elkonin sound boxes to mark or write the sounds they hear in words, or they can use picture cards to sort by the beginning, middle, and ending sounds (2016).

Conclusion

Phonological awareness in the early grades has proven to be effective in providing students with a strong foundation in literacy that diminishes the chance that students have difficulty reading by grade four. Studies have confirmed the efficacy of a structured literacy program as the antidote for preventing future reading difficulties, while providing educators with a procedural implementation for foundational print skills that results in an upward trajectory even for the lowest-performing emergent learner. In conclusion, a structured literacy program provides explicit and systematic teaching through a comprehensive curriculum with a sequential set of phonics elements in a multisensory approach (Al Otaiba et al., 2009; Eissa, 2014; Ghoneim & Elghotmy, 2015; Goldstein et al., 2017; Lim & Oei, 2015; Vaden-Kiernan et al., 2016; Wise et al., 2015) because students develop their PA through their development of phonemic awareness.

Biemiller (1978) found that reading differences emerged as early as the middle of first grade, and therefore, necessary to consider variability in student achievement when grouping for explicit instruction. Carson et al (2008) determined the importance of explicit phonemic awareness instruction for struggling readers in their study of British schoolchildren; the percent

of students being identified as having a reading disorder reduced from 20% to 5% among those who received the explicit phonemic awareness instruction. A multisensory approach is beneficial in a structured literacy program; Giess et al., (2012) and Campbell et al., (2008) found that students who received a multisensory approach in PA increased their word attack skills and their ability to fluently decode.

Cunningham, Stanovich (2001) and a host of other researchers have agreed that phonological skills are the foundation for learning to read and write (Al Otaiba et al., 2009; Carson et al., 2013; Duff et al., 2011; Stanovich, 1986). A structured literacy program with a multisensory approach will continue to support students in developing their PA to become successful readers. As well as provide teachers with strategies to help their students achieve in reading.

Methodology

Introduction

Students are expected to read and comprehend at an earlier age (Carson, et al., 2013); however, at least twenty percent of children have difficulty mastering the skills required to become proficient readers; while eight to ten percent of kindergarteners exhibit significant delays (Toste et al., 2014; Trehearne, 2003). A structured literacy program of phonological awareness is essential if the goal is to increase the percent of students having phonological and alphabetic skills (Goldstein et al, 2017; Toste et al, 2014; At Otaiba, 2009). As a result, this action research project had two goals. The first goal was to determine the importance and benefits a multisensory phonological awareness program has on the future reading achievement of struggling elementary school students; the second goal was to determine research-based strategies that are effective in a small group setting. The project aimed to discover successful strategies to teach PA within the classroom for students to become strong decoders while reading.

Participants

From the larger school population, the study focuses on eight specific students, comprised of five females and three males ranging from six to seven years old. The sample size would not be sufficient to provide significant results; however, the purpose of this action research project was to improve my own instruction in PA.

The students that were selected to participate in the pilot have been identified as struggling readers through universal district assessments administered at the beginning of the 2017-2018 school year. All students were reading a minimum of one level below the grade level benchmark as measured by the Developmental Reading Assessment (DRA) (Beaver & Carter, 2011). The DRA is a formative reading assessment in which teachers are able to systematically

observe, record, and evaluate changes in student reading performance. It consists of leveled texts students read to determine their highest independent reading level and includes recommendations for scaffold support to increase student reading proficiency (2011). The children were placed in small groups that met three to four times a week for 15 minutes per session.

This suburban elementary school in central Connecticut serves approximately 446 students from kindergarten through sixth grade. Racial diversity accounts for 23% of the school population, with 2.9% Asian American, 2.7% African American, 14.1% Hispanic/Latino, and 3.3% are self-identified as two or more races. Students with disabilities account for 17.2% of the student population. EL services are provided for the 8.5% who are not fluent in the English language (Connecticut State Department of Education [CSDE], 2017).

Materials

As the action research project began, I assessed students' proficiency of PA through various progress monitoring tools. The Gallistel-Ellis Test of Coding Skills, a criterion-referenced assessment with a reliability of 0.985 for the Reading subtest and 0.981 for the Spelling, subtest were used to evaluate students' phonological awareness skills (Gallistel & Ellis, 2005). The instrument was selected because it determines the percentage correct for each area administered to the student.

The areas tested in the Gallistel-Ellis Test of Coding Skills included single consonant sounds, and open and closed syllables. The single consonant sounds and short and long vowel sounds subtest consist of the 26 letters in which students are asked to provide the sound(s) for each letter (Figure 1). The benchmark score was 23 correct sounds, or 71% correct. Students were asked to read consonant/vowel/consonant (CVC) words, such as "can," and "kid" (Figure

2). The benchmark score for CVC was 18 words read correctly, or 72%. Further, students read consonant/ consonant/ vowel/ consonant/ consonant (CCVCC), including “that,” and “chest” (Figure 3). The benchmark score for CCVCC subtest was 14 words read correctly, or 70%. Students who scored below the benchmark for each subtest were identified to receive instruction in the structured literacy program.

Additionally, The STAR Early Literacy Assessment, which is a computer adaptive norm-referenced assessment with a retest reliability of 0.86 was selected because it provides a percent correct for phonemic awareness and provides eight subscores in word knowledge and skills, including rhyming and word families, blending word parts, blending phonemes, initial and final phonemes, consonant blends, medial phoneme isolation/manipulation, and phoneme segmentation (“STAR early literacy,” 2015). Student performance is represented by scaled scores, which classifies each student into either emergent reader, early emergent reader, or late emergent reader (2015). The STAR Early Literacy provides teachers with instructional needs and enables teachers to target literacy instruction in order to improve the overall literacy skills of each student (2015).

The structured literacy program, Foundations (2002), was implemented because it is a research-based program that includes specific measurable student learning objectives and systematic word study. Each lesson builds on prior knowledge, while reviewing past concepts; lessons provide students with multiple opportunities to practice concept, skills and strategies (2002). Initial lessons focused on phonemic awareness skills: blending, segmenting, and manipulation of sounds. Explicit instruction was given in phoneme segmentation and consonant digraphs (Wilson, 2002). The intervention followed Level one -Unit two and three. At the end of

the six weeks the eight students were administered the Gallistel-Ellis Test of Coding Skills, and the STAR Early Literacy.

Procedure

Over the course of a six-week period, the eight first grade students received intervention services three days a week for duration of thirty minutes. Research-based strategies were incorporated into their instructional time within the classroom, using word study, and spelling of the Foundations program (Wilson, 2002).

Following teacher modeling, guided practice, and independent practice, students had the opportunity to interact with word building activities and texts to practice the skill of decoding unknown words. Posttest administration of the Gallistel-Ellis Test of Coding Skills revealed the extent to which students increased their skill in decoding short syllable and short syllables with consonant digraphs.

Section 4: Data Collection and Analysis

To measure academic progress of first grade students over the course of the intervention period, I considered two different data points. At the beginning of the action research project, students were administered the pretest of the Gallistel-Ellis Test of Coding Skills to determine students ability to decode short syllables, with and without consonant blends (Gallistel & Ellis, 2005). Students were also administered the STAR Early Literacy because it provides subscores in rhyming and word families, blending word parts, blending phonemes, initial and final phonemes, consonant blends, medial phoneme isolation/manipulation, and phoneme segmentation (“STAR early literacy,” 2015). Additionally, I examined Fall and Winter DRA Benchmark levels to determine academic progress as a result of the intervention.

The Gallistel-Ellis Test of Coding Skills Closed Syllable-Single Consonant assessed students’ ability to decode CVC words (Figure 4). At the beginning of the intervention period, 50% (n=4) of students successfully read ten or less words; the other 50% (n=4) successfully read 11 or more words. The range of scores at pre-testing was from five to 14; the mean score for students assessed at pre-testing was 11 words read correctly.

From pre to posttesting, all students 9 (n=8) increased their score for decoding closed syllable-single consonant words as measured by the Gallistel-Ellis Test of Coding Skills Closed Syllable-Single Consonant. Students on average increased their scores by 11 words read accurately from pre to posttesting. 63% (n=5) of students scored above the mean, while 37% (n=3) scored below the mean. Student 1 increased his score by eight words, Students 2 and 3 increased their scores by 14 words, Students 4 and 6 increased their scores by 12 words, Students 5 and 7 increased their scores by nine words, and Student 8 increased his score by 13 words.

Students 2 and 3 had significant growth with a gain of 14 words read correctly. The growth in students' scores can be attributed to their increased interactions with CVC words. Students received explicit instruction in tapping out phonemes when building and decoding CVC words.

The Gallistel-Ellis Test of Coding Skills Closed Syllable-Consonant Combination assessed students' ability to decode CCVCC words (Figure 5). At the beginning of the intervention period, 100% (n=8) of students successfully read 10 or fewer. The range of scores at pre-testing was from zero to ten. The mean score for students assessed at pre-testing was seven words read correctly.

From pre to posttesting, all eight students increased their score for decoding CCVCC as measured by the Gallistel-Ellis Test of Coding Skills Closed Syllable- Consonant Combination. Student 1 increased his score by four words, Students 2 and 8 increased their score by 14, Student 3 increased her by 13 words, Student 4 increased his score by ten words, Student 5 increased her score by 12 words, Student 6 increased her score by 11 words, and Student 7 increased her score by nine words. Students on average increased their scores by nine words read accurately from pre to posttesting. Students 2 and 8 had significant growth in their data as they made a 14 point growth from pre to posttesting. The intervention program, Foundations (Wilson, 2002), provided students with many opportunities for both guided and independent practice in tapping out phonemes when building and decoding CCVCC words.

Figure 6 represents the DRA levels measured in the fall and the winter. From pre to posttesting 87% (n=7) of students increased their reading level by a minimum of two levels. One student increased one reading level. Three students increased their reading level by four levels, while one student increased his reading level by five levels. In the fall of first grade, our district

benchmarks qualify level three, four, and six as needs improvement, level eight is qualified as approaching standards, and level 10 is considered meeting standards. In the winter, level six is qualified as needs improvement, level 10 is considered approaching standards, and levels 12-18 are meeting standards for first grade. The intervention supported students' growth in reading levels. With explicit teaching, students learned how to tap out phonemes to decode unknown words. Students also used semantic clues to self monitor when reading. Their ability to successfully decode and use semantic clues supported students accuracy and fluency.

Figure 7 represents the percent correct for phonemic awareness on the STAR Early Literacy Assessment. From pre to post, the mean score increased from 56% to 81% mastery indicating the intervention had a positive impact on students overall phonemic awareness skills. Additionally, I analyzed the eight sub skills (Figures 8-15) for further information. All eight subskills increased from pre to posttesting, with the greatest increase in the area of initial and final phonemes, and medial phoneme discrimination. The initial and final phonemes (Figure 11) sub skill had a mean score of 41% to 72% from pre to post. The medial phoneme discrimination (Figure 13) sub skill had a mean score of 31% to 57% from pre to posttesting. The increase in mean scores demonstrates students' increased ability to use their knowledge of tapping out phonemes, and beginning, medial and ending phonemes to listen to a question and respond correctly.

Section 5: Discussions, Recommendations, Conclusions

Findings and Interpretations for Research Question 1

All testing indicates the effectiveness of the intervention strategies on phonological awareness for the sample group leading us to examine the overarching question, “What are the effective strategies for teaching phonological awareness?” I considered Vygotsky’s two key ideas, zone of proximal development and scaffolding, in his theory of social constructivism when implementing strategies (Vygotsky as cited by Tracey & Morrow, 2006). Students formed groups based on their ability to decode short syllables, with and without consonant blends, on the Gallistel-Ellis Test of Coding Skills (Gallistel & Ellis, 2005); the groups ensured “the ideal level of task difficulty . . . at which a child can be successful with appropriate support” (Vygotsky as cited by Tracey & Morrow, 2006).

The group with the lowest scores on the pretest received explicit instruction from the structured literacy program Foundations (Wilson, 2002). A structured literacy program provides explicit and systematic teaching through a comprehensive curriculum, with a sequential set of phonics elements utilizing a multisensory approach (Al Otaiba et al., 2009; Eissa, 2014; Ghoneim & Elghotmy, 2015; Goldstein et al., 2017; Lim & Oei, 2015; Vaden-Kiernan et al., 2016; Wise et al., 2015) because students develop their PA through their development of phonemic awareness. Students had the opportunity to practice the skill of decoding unknown words through modeling, guided practice, and independent practice.

Scaffolding, another key idea in Vygotsky’s social constructivism, refers to the amount of assistance adults and peers provide during a lesson (Vygotsky as cited by Tracey & Morrow, 2006). I provided the explicit teaching, and modeling that allowed the students in this study to

complete the activities independently. I modeled how to segment words into their individual phonemes by tapping out the phonemes across my fingers, and how to blend individual letter-sounds to recognize a word. As students' ability to segment phonemes developed, the explicit instruction and modeling I provided diminished, until students demonstrated independent ability to segment phonemes. Students would orally hear a word, tap out the phonemes, then build the word using letter tiles.

Findings and Interpretations for Research Question Two and Research Question Three

The multisensory approach provides “multiple pathways for learning” (Wale, 2011, p. 85) as instruction involves auditory and visual feedback for sounds, and kinesthetic/tactile input of letter formation (Giess et al., 2012; Lim & Oei, 2015; Walet, 2011). To answer the second and third research questions, “What are the effects of a multisensory phonics program on struggling students”, and “What impact does a multisensory phonological awareness program have on the future reading achievement of struggling primary students?” students received explicit instruction in tapping out phonemes in single syllable words through the Foundations program (Wilson, 2002). Students involved in this study learned how to tap out phonemes while saying the sound and keyword, touching each letter tile and saying the corresponding sound, finger-spelling words while saying corresponding sounds, and visualizing the sight word. The results from this study were similar to Giess et al. (2012) who used the Barton Reading and Spelling System. Students who received a multisensory approach in PA increased their word attack skills and their ability to fluently decode (Campbell et al., 2008; Giess et al., 2012).

Phonological awareness is causally related to the early development of reading skills because students must be able to decode when they are reading; they know the phonemes in an unknown word and can produce the phonemes fluently (Stanovich, 1986). The Foundations

Program (Wilson, 2002) was implemented with fidelity and yielded significant increases in students' skills in phonological awareness. The structured literacy was embedded during the word work block, allowing for not only explicit teaching, but independent practice as well during the literacy block. Phonological awareness in the early grades has proven to be effective in providing students with a strong foundation in literacy that diminishes the chance that students have difficulty reading by grade four.

The sample size was small; however, given the diversity within the group of students, this action-research confirmed the benefits of a structured phonological awareness program on students' ability to decode unknown words while reading, and furthermore supports their ability to write unfamiliar words during the writing block. Students applied their knowledge of phonemes when segmenting and blending words; in addition, students used semantic clues when they were challenged on an unknown word. A structured literacy program that provides explicit and systematic teaching can prevent reading difficulties in most students (Al Otaiba et al., 2009) because students develop their PA through their development of phonemic awareness.

Recommendations for Action

The initial findings of this study will be shared at both the school and district level as part of ongoing professional development for phonological awareness in the elementary grade levels. The reading department, consisting of district and school level literacy specialists, will initiate conversations with the administration to stress the need for a phonological awareness program within our district.

The findings of this study will be shared at the school level with the lower elementary grade teachers. Over the course of the year, the kindergarten through second grade teachers have

been collaborating on lessons, activities, and progress monitoring ideas within phonological awareness. The skills students learned, and the structured lessons will be presented to the group as ways to promote phonics skills within the classroom setting.

Recommendations for Further Study

Next steps for research would include a comparison of two or more first grades in which a structured literacy program was implemented during the literacy block as the dependent variable in a study. The daily implementation of a structured literacy program would determine the extent to which student reading achievement was affected.

Another step for research would be a larger sample size of primary grade students using a structured literacy program daily. I will work with the primary grade level teachers to plan another study in which a structured literacy program is used daily within the classroom setting. A larger sample size will determine the parameters of effectiveness on students' reading achievement.

Conclusion

The more students are exposed to reading, the stronger readers they become (Carreker et al., 2007; Sparks et al., 2013; Stanovich, 1986); however, research has determined, at least 20% of children have difficulty mastering certain skills needed to become proficient readers (Toste et al., 2014). Developing phonological awareness in the early grades has proven to be effective in providing students with a strong foundation in literacy that diminishes the chance that students have difficulty reading by grade four. This study, as well as previous studies, has confirmed the efficacy of a structured literacy program as the antidote for preventing future reading difficulties, while providing educators with a procedural implementation of foundational print skills that results in an upward trajectory even for the lowest-performing emergent learner. In conclusion,

classroom teachers need to provide effective reading instruction to ensure students become proficient readers (Carson et al., 2013). I conclude that increased professional development in foundational literacy skills will support students in becoming more proficient readers.

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Appendix A

Figure 1

GE TEST OF CODING SKILLS
 READING—STUDENT COPY

ISOLATED SOUNDS

b	w	ch	<u>y</u>	oy	ew
d	x	wh	all	oa	<u>eu</u>
f	y	ph	alk	oi	ar
h	z	kn	ai	ow	er
j	c	gn	au	ou	ir
k	g	wr	ay	oo	or
l	<u>s</u>	ank	aw	old	ur
m	tch	<u>ang</u>	augh	ost	war
n	<u>dge</u>	a	igh	ue	-ward
p	<u>qu</u>	i	ind	ui	wor
r	ck	o	ild	ee	-are
t	sh	u	ie	ea	arry
v	th	e	oe	ei	erry
					ear

Figure 2

GE TEST OF CODING SKILLS
READING—STUDENT COPY

I.

can	big	fox	sun	red
fat	six	hop	cup	yet
pal	kid	job	hub	web
jam	vim	rot	yum	peg
han	ziv	wot	sud	ket

Figure 3

GE TEST OF CODING SKILLS
READING—STUDENT COPY

II.

that	kiss	stop	shut	help
track	mint	strong	flunk	chest
splat	frisk	prod	spun	smell
cran	glim	clob	grum	ject

Figure 4

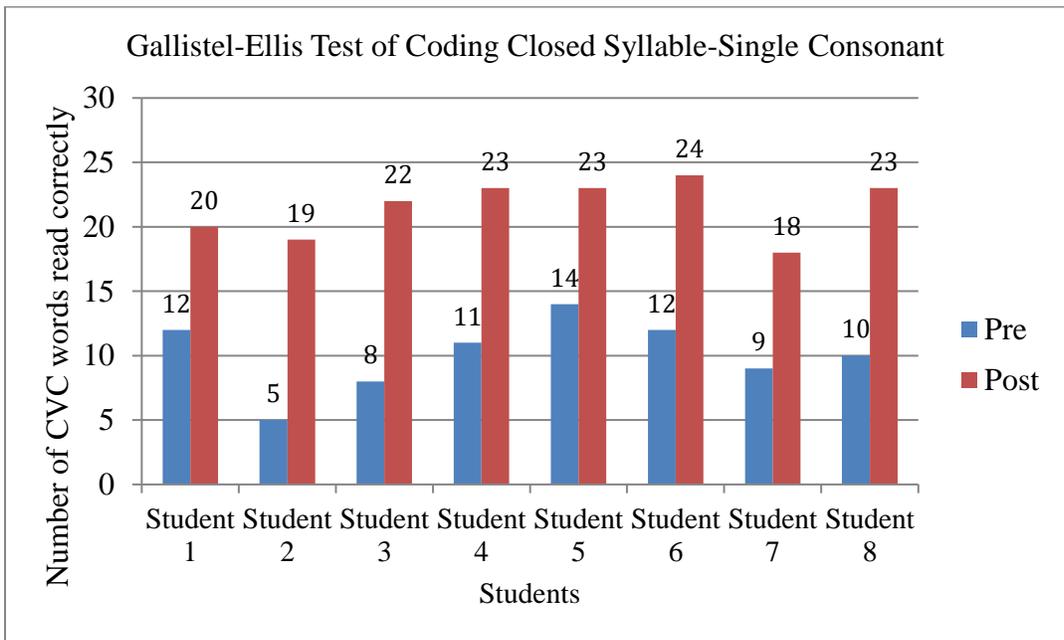


Figure 5

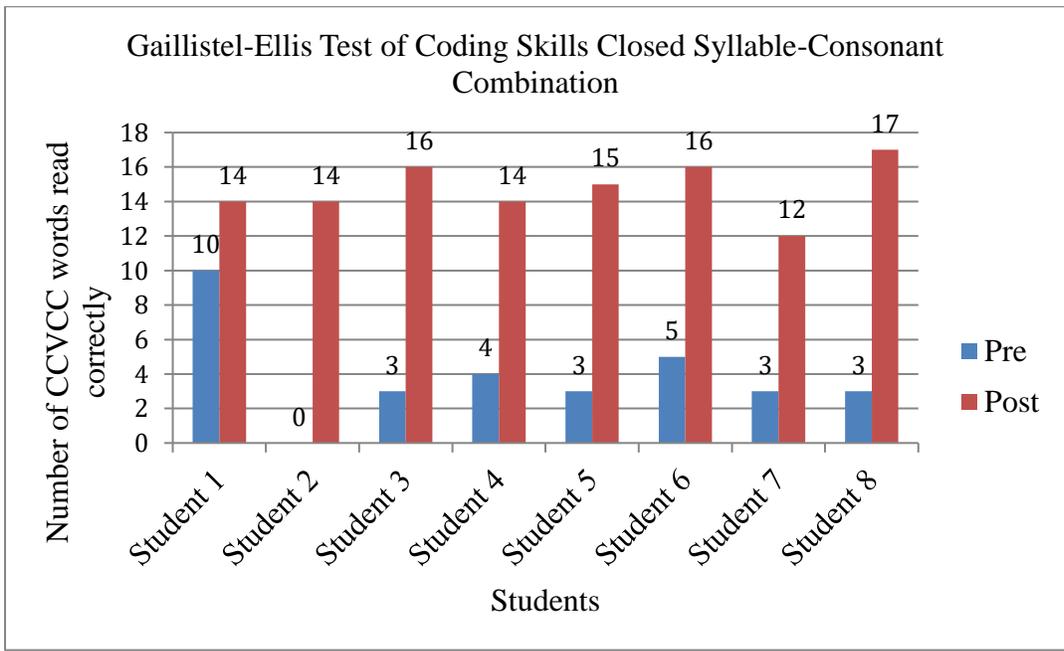


Figure 6

Developmental Reading Assessment Reading Levels

Student	Fall DRA level	Winter DRA level	Gain
1	6	10	2 levels
2	3	6	2 levels
3	6	14	4 levels
4	4	6	1 level
5	10	18	4 levels
6	6	14	4 levels
7	8	12	2 levels
8	4	14	5 levels

Figure 7

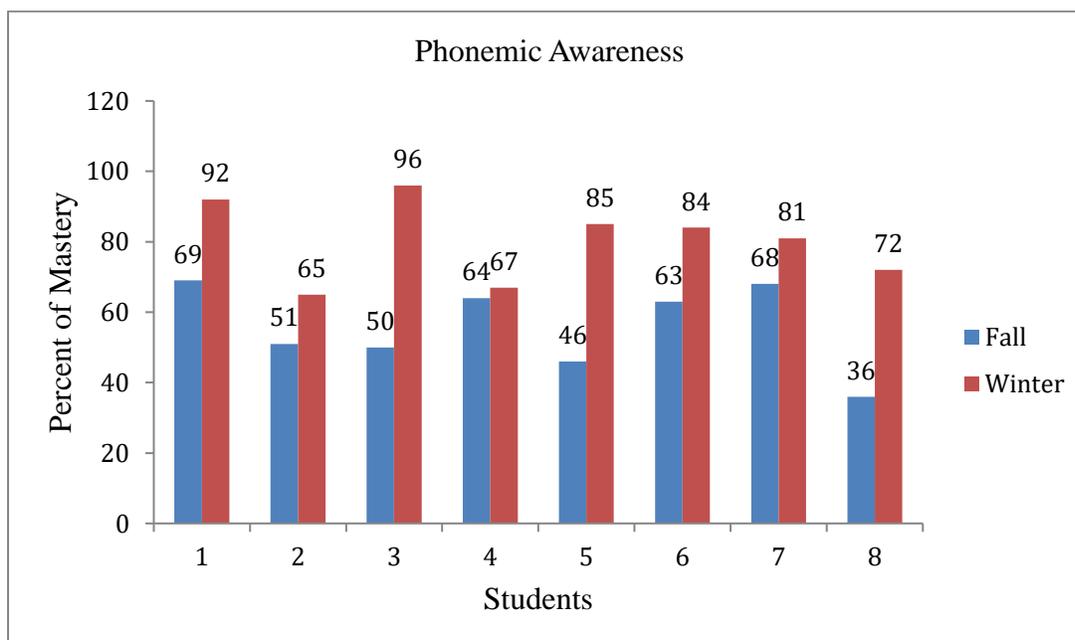


Figure 8

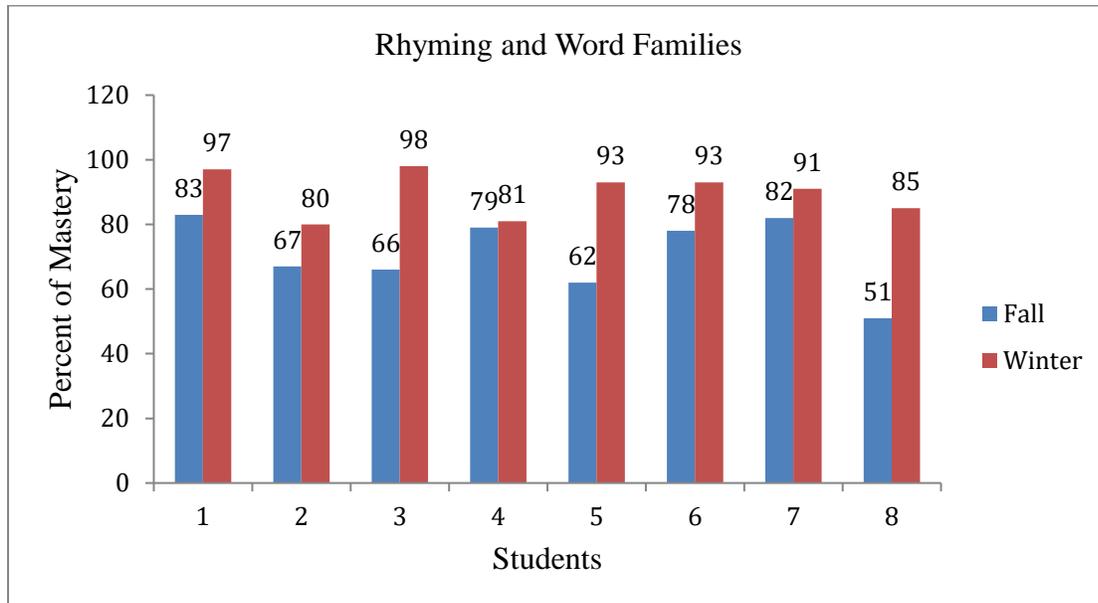


Figure 9

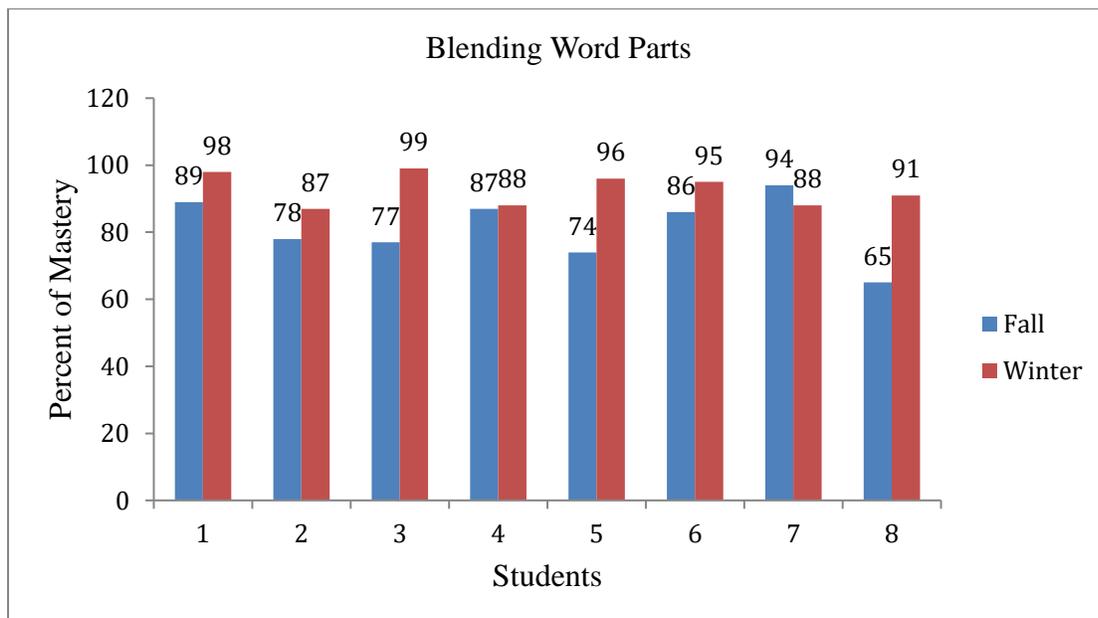


Figure 10

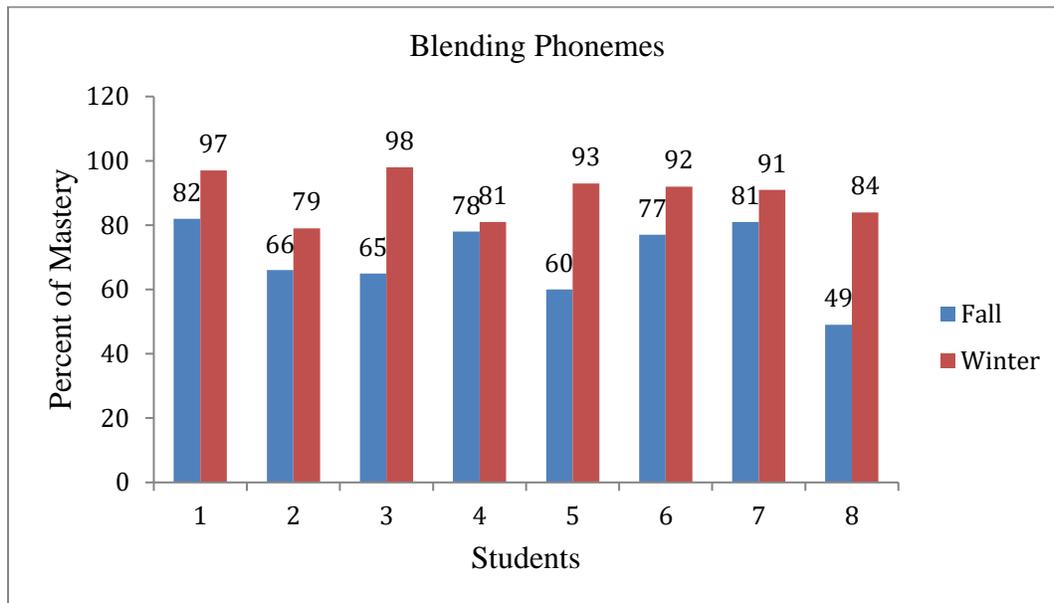


Figure 11

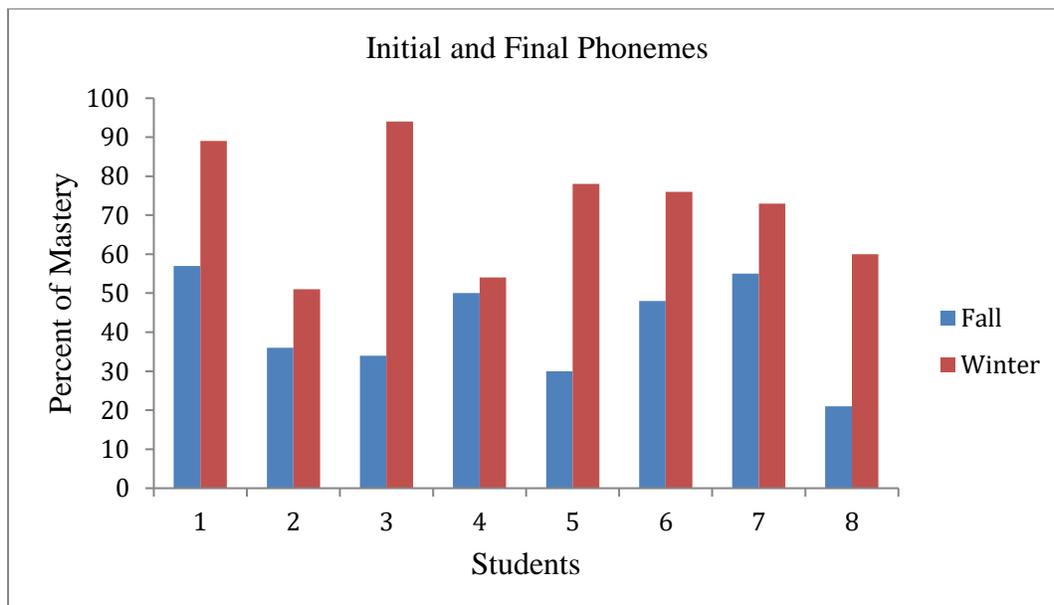


Figure 12

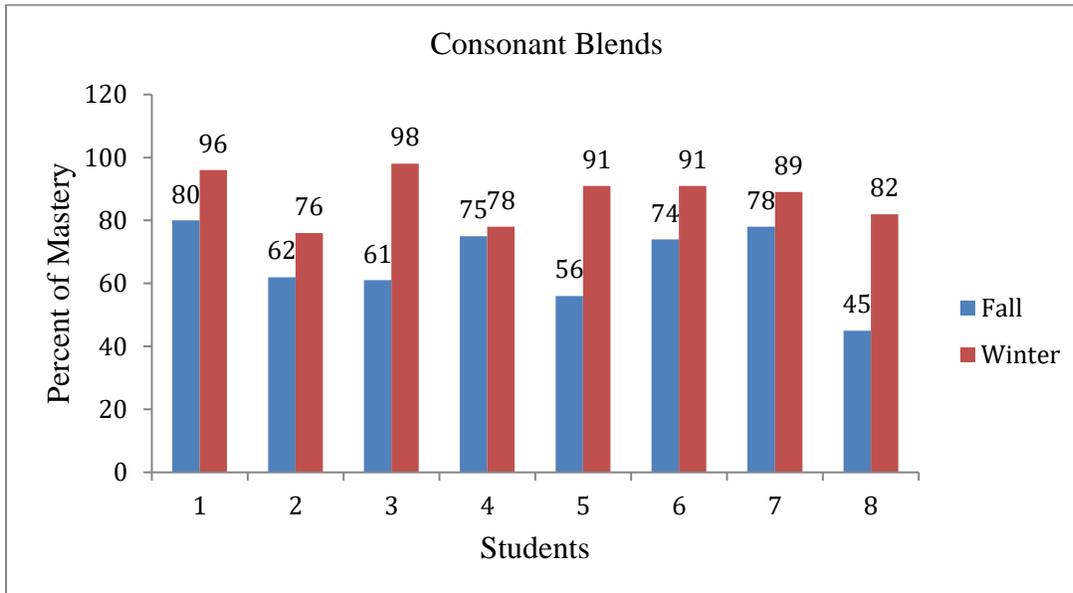


Figure 13

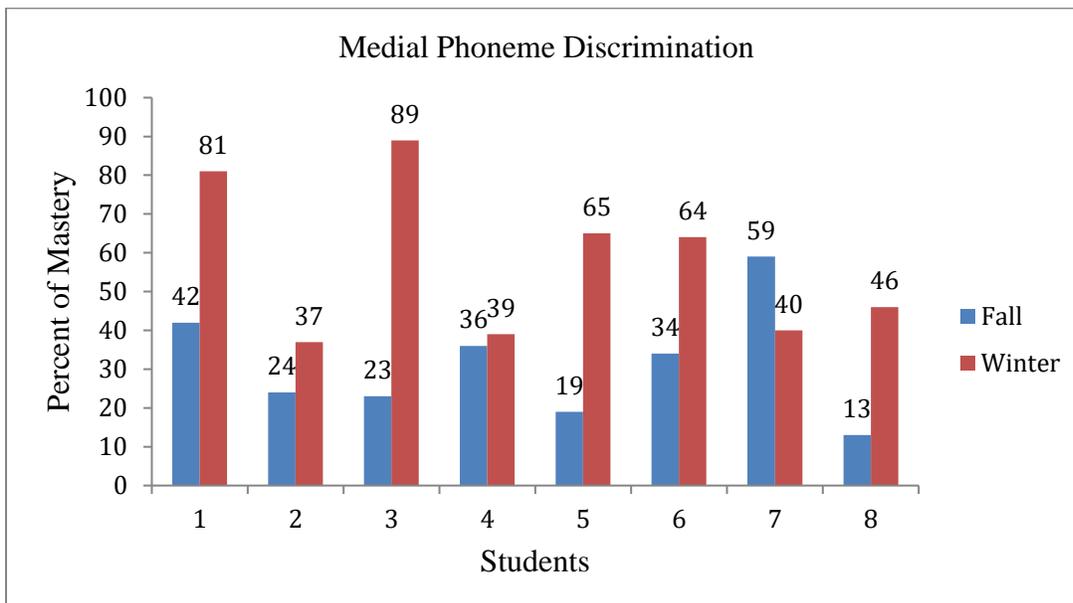


Figure 14

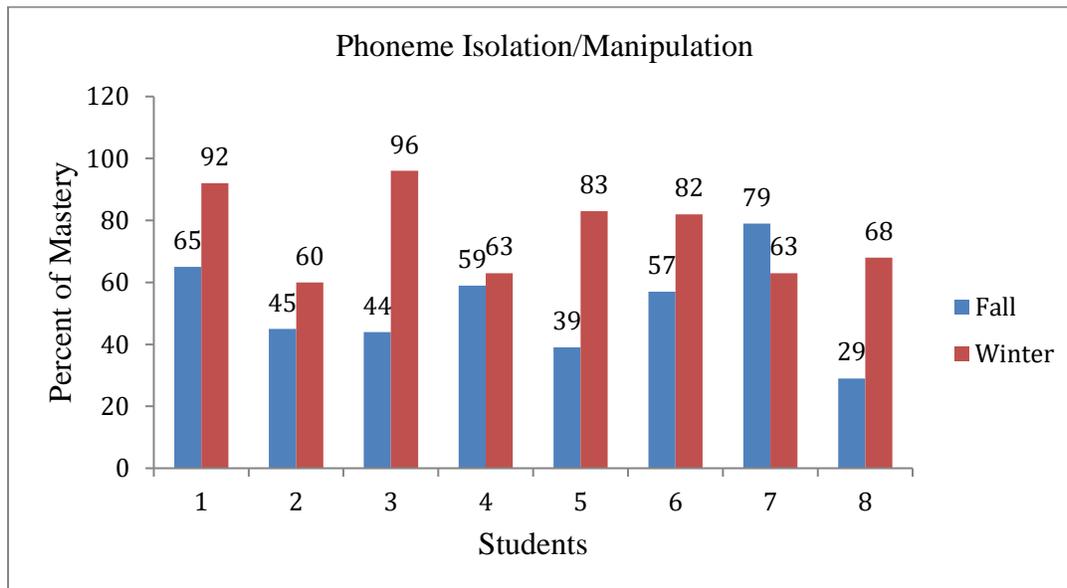


Figure 15

