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**VOCABULARY INSTRUCTION: USING THE KEYWORD APPROACH WITH  
THE INTERACTIVE SMART BOARD IN INCLUSIVE CLASSROOMS**

by  
Kelly Todd Volpe

A Thesis

Submitted to the Department of Language, Literacy and Special Education  
College of Education  
In partial fulfillment of the requirement  
For the degree of  
Master of Arts in Special Education  
at  
Rowan University  
May 7, 2014

Thesis Chair: Jiyeon Lee, Ph.D.

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## **Dedication**

*I dedicate my work to my parents, Jane and Arthur Todd, who are the most supportive parents in every aspect possible, especially during my many college years, and who taught me that education is a necessity; not an option.*

*In addition, I would like to dedicate this to my husband, Daniel Volpe. He was my inspiration to pursue a degree in Special Education, and throughout our years together, has served as my mentor, my advisor, and my editor. On the home front, he took care of running the household during my long days and nights and in the home office, researching and writing and writing and writing...*

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## **Abstract**

Kelly Todd Volpe

### **VOCABULARY INSTRUCTION: USING THE KEYWORD APPROACH WITH THE INTERACTIVE SMART BOARD IN INCLUSIVE CLASSROOMS**

2013/14

Jiyeon Lee, Ph.D.

Master of Arts in Special Education

The purposes of this study are to (a) evaluate the effects of a traditional approach, the definitional approach, to vocabulary instruction for middle school students in an inclusive class; (b) evaluate the effects of using the keyword method in vocabulary instruction for middle school students; (c) evaluate the effects of using the keyword method and the Smart Board in vocabulary instruction for middle school students; (d) compare the effectiveness of the traditional approach, the keyword method, and the keyword method with the Smart Board in vocabulary instruction; and (e) examine the teacher and students satisfaction with the traditional approach, keyword strategy, and keyword strategy with the Smart Board in learning vocabulary words. Results indicate there was no significant difference in vocabulary knowledge of students taught using a traditional approach compared with using the keyword method with and without the Smart Board. Furthermore, there is no significant difference in application of vocabulary words of students taught using a traditional approach compared with using keyword method with and without the Smart Board.

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## CHAPTER 1

### INTRODUCTION

#### **Statement of the Problems**

The Common Core State Standards (CCSS) are new academic standards that have been adopted by 46 states and Washington D.C. in the United States since its inception in 2010 (<http://www.state.nj.us/education/sca/ccss/>). These new standards require all content areas to rigorously implement literacy skills into daily lessons. The goal for the CCSS is to ensure that all students are “college and career ready” by the end of high school. Vocabulary instruction is one of the core components of literacy listed as a vital element in the standards.

According to Ellison and Semrud-Clikeman (2007), vocabulary is the best indicator of an individual’s intelligence quotient (IQ). Knowledge of vocabulary is essential for both receptive (reading and listening comprehension) and expressive language (writing and speaking) to communicate effectively. Vocabulary development increases a student’s overall reading comprehension and fluency, which impacts his/her success in school (Baker, Simmons & Kame’enui, 1998). Students who enter school with limited vocabulary knowledge lag behind in the area of reading fluency and comprehension when compared to their peers (Baker, et al., 1998).

As indicated by Ellison and Semrud-Clikeman (2007), neurodevelopmental disorders of childhood, including language-related and learning disabilities, comprise a large percentage of childhood disorders. Students with learning disabilities (LD) have particular difficulty in gaining vocabulary knowledge because they lack phonological awareness that inhibit them to use the phonemic segments of speech. For example, if a

student is unable to learn the relationship between graphemes and phonemes, he/she will have difficulty in reading, which in turn will affect his/her ability to gain new vocabulary knowledge. Students with LD struggle with applying the alphabetic principle to reading, thus they are easy to lose interests in reading comparing to their non-disabled peers (Jitendra, Edwards, Sacks & Jacobson, 2004). It is found that these students do not engage sufficiently in wide-scale of reading because they lack independent word-learning strategies to facilitate their learning of word meanings in order to understand the text (Pedrotty Bryant, Goodwin, Bryant & Higgins, 2003). These problems are getting serious when these students are entering secondary school. With over 6 million adolescents reading below their grade level, adolescent literacy has become a major problem over the past decade (Cirino, Romano, Barth, Tolar, Fletcher, & Vaughn, 2013; Jofus & Maddox-Dolan, 2003; Vaughn, Denton, & Fletcher, 2010). Today, more and more special education students, especially those classified as LD, are placed in an inclusion classroom. Unfortunately, little evidence shows that students with LD are more successful in inclusive versus non-inclusive settings or vice versa (Fore III, Hagan-Burke, Burke, Boon, & Smith, 2008). Only a small difference was found in a literature class (e.g. Fore III, et al., 2008). In their study, students with LD showed higher academic achievement in an inclusive class versus their peers with LD who were in a non-inclusive setting. More studies are needed in inclusive classrooms to evaluate students' performance, especially those with LD.

Over the past years, some vocabulary strategies have been recommended to teach students with LD. These include definitional approach (e.g. Collins & Loftus, 1975; Gipe, 1978; Stahl & Fairbanks, 1986), keyword approach (e.g. Levin, McCormick,

Miller, Berry, & Pressley, 1982; Levin, Levin, Glasman, & Nordwall, 1992; Rekrut, 1996), and technology-based instruction (e.g. Abram, 2004; Stoner, Beck, Dennis, & Parette, 2011; Warner & Jones, 2011).

The definitional approach started in the 1970s to focus on the relationships between a word and other known words using a dictionary (Nagy, 1988). This approach emphasizes dictionary work, memorization of synonyms, and classification of word lists. Students learn words by memorization of definitions, linking with other known words to expand their vocabulary knowledge. This traditional way to teach vocabulary may not motivate students, especially those with LD, who are always passive learners (Jitendra et al., 2004). In addition, students with LD may struggle to learn new vocabulary words using traditional methods because they usually have memory deficits (Mastropieri & Scruggs, 1998).

The keyword method was considered as an effective strategy in vocabulary instruction (e.g. Levin, McCormick, Miller, Berry, & Pressley, 1982; Levin, Levin, Glasman, & Nordwall, 1992; Rekrut, 1996). This strategy refers to a mnemonic illustration using visual aides to associate with the word meaning and pronunciation. It has a two-stage procedure for improving learner's memory of new vocabulary words and their definitions (McDaniel & Pressley, 1984). When using the keyword strategy, an association between the unfamiliar new word and a familiar word that sounds similar to the main part of the new word, refers to the keyword. Then, an image connecting the keyword to the unfamiliar vocabulary word is developed to help students retrieve the word in their memory through the image. For example, the word "carlin" means "an old woman". Students might use "car" as the keyword because of its similar sound of the

initial part of the word, and an image of an old woman driving a car is demonstrated to help remember that “carlin” means “an old woman” (McDaniel & Pressley, 1984).

Another example is the word “angler”. “Angler” means “a person who catches fish for pleasure”. “Angel” is used as the keyword and the image of an angel catching a fish to link the target word and the keyword (Stahl & Fairbanks, 1986).

In order to successfully implement the keyword strategy, students must be trained on how to correctly execute each stage. At the same time, teachers need to model the stages of keyword instruction and provide guided practice. In addition, teachers should frequently evaluate the procedure students applied to ensure the keywords and images are associated appropriately (Stahl & Fairbanks, 1986).

Using technology in vocabulary instruction is not a novice concept in the classroom. Kim and Gilman (2008) indicated that multimedia graphics provided students an opportunity to develop their vocabulary knowledge. It was found that visual media increased vocabulary acquisition and retention (Kim & Gilman, 2008). Incorporating video technology to teach vocabulary and reading comprehension skills to students with LD improved their word acquisition (Xin & Rieth, 2001). Technology as a tool is an important factor in today’s classroom and teachers should consider incorporating technology into their lessons.

An interactive whiteboard, known as Smart Board, is a popular technology tool used in classrooms. When a Smart Board is connected to a multimedia projector and a computer, images on the computer screen can be projected onto the board. With touching on the board, learners are able to draw, write, type, and move images and words. Since its creation, teachers have been using the interactive Smart Board as a way to enhance

their vocabulary instruction (Fernandez & Luftglass, 2003). For example, the Smart Board software allows teachers to create activities for students to match a word with its definition by physically moving the word next to the definition. This shows an interesting, motivating twist for a vocabulary learning activity. However, despite all the possibilities the use of Smart Boards little research has been found in vocabulary instruction, especially in inclusive classrooms for students with and without disabilities. More studies are needed in this area to evaluate this technology tool in language instruction. Review previous research, it is found that limited studies were conducted in secondary school. It seems imperative for research to evaluate middle and high school student performance when technology, such as Smart Board is provided in vocabulary instruction.

### **Significance**

The keyword method has proven to be an effective strategy for acquisition of vocabulary words (Wyra, Lawson & Hungi, 2007). Despite the decades of research on the keyword strategy, little research has been conducted to apply the keyword strategy using technology. Incorporating technology with this already proven effective strategy may increase students' interests and update and extend the previous research. This study attempts to implement the keyword strategy through the use of a SmartBoard in class to teach vocabulary in inclusive classrooms for students with and without disabilities. It is my hope to update the proven effective strategy with technology to motivate students' learning and to improve their vocabulary skills. It is time to bring the keyword mnemonic strategy to the 21st century and to meet the academic standards of today's education. In addition, this study will compare students' performance in vocabulary learning in the

inclusive setting with different instructional strategies such as traditional keyword and keyword with technology.

### **Purposes of the Study**

The purposes of this study are to (a) evaluate the effects of a traditional approach, the definitional approach, to vocabulary instruction for middle school students in an inclusive class; (b) evaluate the effects of using the keyword method in vocabulary instruction for middle school students; (c) evaluate the effects of using the keyword method and the Smart Board in vocabulary instruction for middle school students; (d) compare the effectiveness of the traditional approach, the keyword method, and the keyword method with the Smart Board in vocabulary instruction; and (e) examine the teacher and students satisfaction with the traditional approach, keyword strategy, and keyword strategy with the Smart Board in learning vocabulary words.

### **Research Questions**

1. Are there any differences in vocabulary knowledge of students with and without learning disabilities taught using a traditional approach as compared with those using the keyword method, the keyword method with the Smart Board?

2. Are there any differences in application of vocabulary words of students with and without learning disabilities taught using a traditional approach as compared with those using the keyword method, and the keyword method with the Smart Board?

3. Are there any differences in satisfaction of students with and without learning disabilities taught using a traditional approach as compared with students using the keyword method, and the keyword method with the Smart Board?



## CHAPTER 2

### REVIEW OF LITERATURE

It is strongly supported that a student's capability in acquiring vocabulary words is a determinant of success in reading (Biemiller, 2003). In other words, vocabulary knowledge has a direct effect on reading comprehension (Stahl & Fairbanks, 1986). This chapter reviews research on different vocabulary instructional strategies including definitional approach, keyword strategy, and technology-based vocabulary instruction. In addition, research on vocabulary instruction in inclusive classrooms is reviewed.

#### **Strategies for Vocabulary Instruction**

**Definitional Approach.** Stahl (1983) investigated the effectiveness of two types of vocabulary instruction, the definitional method and a mixed method (definitional and contextual methods). Twenty-eight 5th graders were divided into three groups: A (6 students), B (11 students), and C (11 students). Thirty target words at the 8<sup>th</sup> grade level were selected for the students to learn (Stahl, 1983). Each group has three phases: baseline without training, receiving training on the definitional method, and the mixed method respectively. A different list of 10 words was taught each week for three weeks. Each phase consisted of one lesson per day for four days, followed by a posttest on the 5th day.

During the baseline, no training was provided on the target words. The students reviewed words following a supplementary comprehension skills book to complete the activity four days and on the fifth day, a test was provided.

During the first intervention, the definitional method was provided to teach each target word. For example, on the first day, students were instructed to look up five target

words in the dictionary. Then, the words and definitions were discussed in class. On the second day, the same words were reviewed and practiced using a worksheet with matching the words with synonyms. On Day 3 and 4, the same procedures were implemented with the second set of five words.

During the second intervention, the mixed method was provided to teach students with definitional and contextual information about the words. For example, on the first day, students were given five words and their definitions. Then, the class would discuss the definitions of the words and the meaning of each word used in two different sentences. Students discussed the words in the sentences, and then created their own sentences using the words. On the second day, students reviewed the words by completing fill-in-the-blank exercises and creating their own sentences. When the exercises were complete, further discussion was followed. The same procedures were repeated on Days 3 and 4 with the second set of five words.

Results show that the two groups received vocabulary instruction, either definitional or mixed with contexts, produced significantly higher scores on both passage and vocabulary tests. This indicated that definitional approach had a significant effect on reading comprehension and vocabulary learning. Students received definitional and contextual mixed method produced higher comprehension scores than the definitional approach only (Stahl, 1983).

Similar results were found in the studies by Collins and Quillian (1969), Glass and Holyoak (1975), and Meyer and Schvaneveldt (1976). The use of the definitional approach appears to be effective in vocabulary instruction. However, Thorndyke (1975), Kintsch (1974), and Fodor, Garrett, Walker, and Parkes (1980) indicated the definitional

approach ineffective, because knowledge of word meanings involves more than definitions, that definitional knowledge may not usually be applied in reading comprehension. Thus, different instructional approaches should be considered in vocabulary instruction.

**Keyword Approach.** Keyword approach refers to developing mental imagery for the vocabulary acquisition (Atkinson & Raugh, 1975). It is a mnemonic illustration to connect the new vocabulary with a similar-sounding word a learner has already known and an image to present the meaning of the word (Levin, 1993). For example, the word “accolades” sounds similar to the popular drink Kool Aid. The keyword Kool Aid can relate to the definition of “accolades” (praise for something well done). A student could imagine a group of people raising their glasses of Kool Aid to toast an accomplished guest of honor (Levin, 1993). This process includes the three mnemonic components of recoding, relating and retrieving (Levin, 1993).

The keyword method was used for students to acquire vocabulary in learning a second language. In Atkinson and Raugh’s study (1974), students were randomly assigned to an experimental or a control group. The keyword method was provided for the experimental group. For example, while a Russian word was being pronounced, a keyword (or keyword phrase) would be displayed on left of the computer screen and English translation would appear on the right. These students were instructed to learn the keyword first and then imagine an interaction between the keyword and English translation. If students could not visualize a connection, they could create a phrase or sentence incorporating the keyword and the translation in a meaningful way. For the control group, each Russian word was pronounced, the English translation would be

displayed on the center of the screen. The students were required to remember translation to understand the word. The final session took place 30 to 60 days with an average of 43 days from the initial training for the Comprehensive Test. Results show that students in the keyword group scored higher on all tests compared to the control group. In fact, on each day the keyword group learned at least as many words in two trials as the control group learned in three trials (Atkinson & Raugh, 1974).

Further, Mastropieri, Scruggs, Levin, Gaffney, and McLoone (1985) conducted two experiments to examine the effectiveness of the keyword method versus Direct Instruction (DI). In the first experiment, 32 students with LD participated. Of these, 21 were boys and 11 girls with an average age of 13-14. With grade levels equally represented in each group, 16 students were randomly assigned to learn vocabulary using the keyword method and the other 16 were instructed with DI (Mastropieri et al., 1985).

Sixteen unfamiliar words were taught to both groups. In the keyword group, each vocabulary word was presented with the keyword and the meaning on a standard-sized card stock along with a black and white drawing presenting the meaning. For the DI group, a similar card was created, however, each card only presented the vocabulary word with the meaning (Mastropieri et al., 1985).

All students were given one to one instruction for the same amount of time. Lessons followed the prepared scripts and the students were told that they would learn some vocabulary words and then take a short quiz. The two sample words were presented to model the procedures in each group. Students in the keyword group were first taught the keywords for the sample words, followed by the mnemonic illustration to show the interactive pictures for the words. Then, the retrieval steps to recall the

information were explained and a test on the two words was provided. Students were taught each word and its meaning using the same procedure. For example, the experimenter presented each mnemonic picture for 20 seconds and said, “The word clue for ranid is rain, and ranid means frog. Remember this picture of a frog in the rain. Remember this picture of what? And ranid means what?” This was repeated for each word and after the presentation of last vocabulary word, the experimenter reminded students to apply the appropriated mnemonic retrieval steps to recall the vocabulary. In the DI group, the experimenter showed each picture and said, for example, “Ranid means frog, what does ranid mean?...Right, this is a picture of ranid and ranid means frog. What does ranid mean?” Like the keyword group, the students were then given a practice test. The experimenter went through all 14 vocabulary words and their meanings using pictures. Results showed that students in the keyword group outperformed those in DI, with 40% of increase in their test scores (Mastropieri et al., 1985).

A second experiment included students with LD using self-generated mnemonic imagery related to DI in a vocabulary learning task. The same procedures and materials were provided as that in the first experiment. However, in the keyword group, students were given illustration during the presentation of the 14 vocabulary words. Their cards contained only printed vocabulary words, keywords, and definitions. The experimenter said, for example, “The word clue for ranid is rain and ranid means frog. Think of a picture of rain and a frog doing something together.” Also, mnemonic drawings were provided for the two sample words to illustrate an example of a good interactive mnemonic picture. Results showed that students gained more in using the keyword mnemonic approach compared to the DI with 20% of increased scores. It is found that

using mnemonic keyword approach provides an image for students to link with the meaning of the word, which reinforces their learning so that they may recall from the image to activate their memory (Mastropieri et al., 1985).

Levin, Levin, Glasman, and Nordwall (1992) conducted four experiments to determine the effectiveness of the keyword method. In the first experiment, 90 students in 7th grade and 105 in 8th grade were selected and randomly assigned to one of the four experimental conditions, representing two strategies, context and mnemonic, in two learning formats, individual and small group. Sixteen target words (i.e. low-frequency nouns) were selected along with a concrete keyword for each vocabulary word. Each word and its definition was visible for 45 seconds and read aloud by the experimenter. Students in the individual settings worked silently with paper and pencil using the designated strategy (context or mnemonic). In the small group settings, students discussed with peers, without paper and pencils.

In both individual and small group context conditions, students were required to create a “definition-eliciting” sentence for each of the target words. Clearly, students in the small group worked together to generate a sentence. Similarly, in both individual and small group using keywords, the students were instructed to think of a keyword for each target word and create a sentence linking the keyword and the target word. Again, students in the small group developed the keyword and sentence collaboratively.

Immediately after studying the 16 words, all students individually completed two vocabulary tests, one for definition recall and the other for sentence comprehension. This test was administered 10-14 days later to evaluate definition recall and sentence comprehension.

Results of Experiment 1 showed there was no significance in student performance between the individual and small group using context, nor the individual and small group using keywords. However, students in keyword groups far exceeded that of context groups on both immediate and delayed tests (Levin, Levin, Glasman, & Nordwall, 1992).

In Experiment 2, an extension was provided and the same sentences were also used. Results showed that the keyword group outperformed the context group, regardless of whether the sentence were the same or different (Levin, Levin, Glasman, & Nordwall, 1992).

In Experiment 3, the same methods were used as in the first two experiments, however, 4th graders were included to examine the keyword method for younger students. Some of the vocabulary words selected did not have “easy-to-derive” keywords, and students had to recall a narrative passage that incorporated the vocabulary words. After teaching the 16 words, all students were given a definition recall test. Subsequently, the experimenter read aloud a passage in class consisting of all 16 target words while the students read along silently. The students were required to recall the story. It was found that students using the keyword outperformed the other students (Levin, Levin, Glasman, & Nordwall, 1992).

Experiment 4 was designed to examine students using the keyword method individually. Fifty-two, 3<sup>rd</sup> graders and 22, 4th graders participated and were assigned to one of the three instructional conditions: application of keyword method in pairs, application of keyword method individually, and application of his/her own best method individually (free study). Twelve words were taken from the previous experiment (6 with obvious keywords and 6 with non-obvious keywords). After teaching the 12 words, the

students individually completed a written definition recall test. Then, the experimenter read aloud a story which incorporated the 12 target words. A test was given to evaluate their recall and comprehension of the story. Three days later, the students completed a delayed definition recall test. Results show that students in the keyword groups, with or without a partner, remembered more definitions, immediately and delayed, than the free study group. There were no statistical differences between the two types of keyword groups. The story recall and comprehension test proved difficult for all students; however, the keyword groups slightly outperformed the free study group (Levin, Levin, Glasman, & Nordwall, 1992).

In summary, results show that in all experiments, the students using the keyword method, whether individual, paired, or small group, outperformed their sentence-context and free-study counterparts on both immediate and delayed measures of definition recall (Levin, Levin, Glasman & Nordwall, 1992). In addition, in three of the four experiments mnemonically instructed students were superior on tests of vocabulary usage (sentence and story comprehension) (Levin, Levin, Glasman, & Nordwall, 1992).

However, in contrast to Levin, Levin, Glasman and Nordwall's study (1992), Wang and Thomas (1995) found that while the keyword mnemonic strategy outperformed the semantic context strategy on the immediate posttests, the semantic context strategy outperformed the keyword strategy on the 2-day delayed recall posttests.

Hall (1988) conducted three experiments to examine the effectiveness of the keyword mnemonic strategy and discussed three limitations of the keyword mnemonic method. These include brief training to limit the full potential of the method with



repeated use by students in real vocabulary-learning settings, it's better if students have extensive training on the crucial components of the keyword technique.

In addition, students using the keyword method outperformed the control group, but that difference was not significant for words with obvious keywords. The students in the control condition scored significantly higher than those in the keyword condition for words that did not have obvious keywords (Hall, 1988).

Interestingly, a pattern found throughout this literature review is that nouns are always used in the implementation of the keyword method. Additional research is needed to examine whether this method can be effective when teaching other words such as verbs or adjectives.

### **Vocabulary Instruction in Inclusive Classrooms**

According to Scanlon and Baker (2012), an inclusive setting is becoming more popular as school districts strive to give students with disabilities “appropriate education” in the least restrictive environment to provide educational and social benefits to students with and without disabilities. In such an environment, the challenge facing the teacher is how to provide appropriate instruction to meet all students' needs.

Embedded instruction was suggested to improve learning for students with disabilities in inclusive classrooms (McDonnell, Johnson, Polychronis, & Risen, 2002). Embedded instruction is that students with disabilities are taught skills within the ongoing routines of general education peers (McDonnell, Johnson, Polychronis, & Risen, 2002). The teacher systematically controls the instruction and the instructional procedures are designed to support the students with disabilities for their acquisition of the target skill. However, it is different from traditional teaching formats in that the instructional of target

skills is embedded within the whole class lessons being provided to students without disabilities. Embedded instruction is accomplished by arranging the environment and tasks so that instruction for the target skills is implemented when natural opportunities arise in the ongoing activities or when the student is transitioning from one activity to another (McDonnell, Johnson, Polychronis, & Risen, 2002).

McDonnell, Johnson, Polychronis, and Risen (2002) conducted a study in an urban junior high school to evaluate embedded instruction. The participants were four students with moderate mental retardation enrolled in at least two general education classes each day. These students' IEPs focused on the acquisition of skills that were part of the general education curriculum, and embedded instruction was provided in the class.

Two students were taught to read 15 cooking and nutrition symbols (e.g. "lb." for pound) and words that students without disabilities were expected to read and spell. These words were organized into three instructional sets of five words selected randomly out of a list of words that the students were unable to read.

A third student was taught to give verbal definitions of 15 health words. The fourth student was taught to give verbal definitions of 15 computer words. These words were randomly selected from a list of words they were unable to define. The words for both students were organized into three instructional sets of five words. Both students were shown the words printed on flashcards and given the prompt "What is the definition of (word)?"

Results indicated that embedded instruction led to the acquisition and maintenance of the target skills of students with disabilities (McDonnell, Johnson, Polychronis, & Risen, 2002). It seems that such instruction is an effective approach for

teaching skills of students with moderate disabilities following the general education curriculum (McDonnell, Johnson, Polychronis, & Risen, 2002). The students with disabilities acquired the targeted skills within the structure of the general education classroom when they were taught the skills embedded in the general education curriculum (McDonnell, Johnson, Polychronis, & Risen, 2002). Although results show that students learned to read or define vocabulary words, it is not clear whether these students were able to generalize these skills to the instructional activities and instructional materials provided by the general education teacher. In addition, the study only focused on teaching discrete skills (i.e. sight word recognition or word definitions) rather than more complex chains of skills, such as reading comprehension (McDonnell, Johnson, Polychronis, & Risen, 2002).

Further, class-wide peer tutoring (CWPT) and constant time delay (CTD) were combined in vocabulary instruction to teach students with and without LD in an inclusive classroom (Hughes & Frederick, 2006). CWPT is an instructional approach that simultaneously engages all students with the content through reciprocal peer tutoring opportunities. Basic components of this approach include partner pairing, two competing teams, immediate error correction, and contingent point earning and recording individual team performance (Hughes & Frederick, 2006).

CTD is a response-prompting procedure that incorporates an infallible approach to learning, leaving room for very few errors. Additionally, CTD incorporates frequent opportunities to respond and immediate feedback and consequences for students' responses. CTD is a systematic procedure that provides models, usually in the form of flashcards, of the correct response until the student can respond independently without

the model. During the initial trials, the students are provided with the correct answer immediately following the prompt. After the initial trials, they are given the opportunity to respond, with a 3 to 5 second wait time, before the answer is provided (Hughes & Frederick, 2006).

A total of 18, 6<sup>th</sup> graders, 3 with and 15 without LD participated in this study together with one general and one special education teacher, working as a team and sharing the responsibility of the language arts instruction. Teachers were trained on CWPT and an integrity checklist was used to ensure the accuracy of the teachers' and students' used of CTD. One instructional session was conducted each school day, teaching a word list of five words. The first session for each word list was delivered with no time delay, but the following sessions had a 5 second delay. When there was no time delay, the tutor orally read a definition from an index card and immediately provided the prompt, the index card with the printed word. The learner sounded out target word and copied into the left column of the student response sheet. The tutor verbally confirmed and repeated each correct response. For incorrect responses, the tutor said "no" and provided the correct response (e.g., "confrontation means face-to- face meeting between opposite sides."). After an incorrect response or no response, the learner said the target word and wrote the correct word in the right column. During the 5 second delay sessions, the tutor read aloud a definition from the index cards and silently counted to five before presenting the vocabulary word. If the learner responded correctly before the vocabulary word was presented, the tutor verbally confirmed and repeated the response. Then, the tutor presented the vocabulary word and the learner wrote the word in the left column of the response sheet. Procedures implemented for incorrect and no response errors during

the 5 second delay were identical to those for the no time delay session. After the tutors presented all five definitions, they shuffled the cards and continued to repeat the procedure. After 8 minutes, the tutor and learner switched roles and repeated the procedures. Using the teams' and partners' chart, the order of the tutor/tutee roles was counterbalanced each day to avoid order effect. At the end of each instructional session the teacher awarded two points for every correct response recorded on the left column of the student response sheet and one point for every corrected word recorded on the right column. The teacher awarded bonus points for good tutoring behaviors observed during the peer tutoring sessions (Hughes & Frederick, 2006).

Results show that all students learned the target vocabulary words using the two strategies. All students with and without LD maintained the vocabulary words over time and generalized the words across the context. On a social aspect, all students and teachers involved in this study support the use of CWPT and CTD (Hughes & Frederick, 2006).

Teaching vocabulary in inclusive settings for students with and without disabilities is a challenge for the teacher to reach the class goal and to meet the needs of individual students with disabilities.

### **Vocabulary Instruction Using Technology**

**Multimedia.** Multimedia refers to the combination of visuals and sounds to present subject content and incorporated in classroom instruction in various ways (Silverman & Hines, 2009). An example of multimedia is video presentations with live action, animation, voice-overs, text, and music.

In Xin and Rieth's study (2001) the effects of using video technology to facilitate vocabulary acquisition and reading comprehension skills of students with LD was examined. Seventy-six students with LD, in 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grades participated in the study. These students were randomly separated into the two groups: video and non-video instruction. Thirty target words related to science were selected for instruction based on the video about the 1989 earthquake in San Francisco. In addition, six narrative passages were selected related to the earthquakes. Each passage contained five of the target vocabulary words. Instruction was implemented in a resource setting three times a week for six weeks. Each session lasted 30 minutes. After all students watch the introductory chapter on the video, teachers implemented the designated type of instruction (video or non-video). A pre- and posttest was administered to all students which assessed definitions of target words, application of words via fill-in-the-blanks, and passage comprehension. Results show that the groups using video technology had significantly higher word acquisition scores than those in the non-video group (Xin & Rieth, 2001).

In addition, Silverman and Hines (2009) compared traditional and multimedia-enhanced read-aloud vocabulary instruction and investigated whether the effects differed for English-language learners (ELLs) and non-English language learners (non-ELLs). There were 85 participants from pre-kindergarten to second grade. The two conditions of multimedia and non-multimedia instruction were provided for 45 minutes a day, three days a week for 12 weeks. Both groups were instructed the same words in the books. The only difference was the number of days students listened to each book and whether or not they watched video presentations related to the content of the books. In the non-multimedia group, teachers read each book on 3 days with scripted curricula that

accompanied the read-aloud books. In the multimedia condition, teachers read each book on 2 days. Then, for 3rd day at the end of the cycle, teachers showed children different clips from a video with the scripted curricula that accompanied the read-aloud books and video clips. Pre- and posttests were used to assess student knowledge of target words, general vocabulary knowledge, and knowledge of science concepts.

Results show that there was no difference on non-ELL students' test scores between both groups. For the target vocabulary assessment, non-ELLs in the non-multimedia group gained 10 points from pretest to posttest, which is the same as the non-ELLs in the multimedia group. However, ELLs in the multimedia group gained 17 points, but ELLs in the non-multimedia group only gained 11 points from pretest to posttest. Similar results were observed for the general vocabulary assessment. Non-ELLs in the non-multimedia group gained 11 points from pretest to posttest and non-ELLs in the multimedia group gained 9 points. However, ELLs in the non-multimedia group gained 11 points, but ELLs in the multimedia group gained significantly more, 23 points. Therefore, the study indicated that multimedia-enhanced instruction did not benefit non-ELLs, but for ELLs. In addition, students using the multimedia-enhanced strategy closed the gap between ELLs and non-ELLs in knowledge of vocabulary words and narrowed the gap in knowledge of general vocabulary. Although there was not a strong impact of the multimedia-enhance instruction, there was no negative influence it is supported to use this strategy in inclusive settings (Silverman & Hines, 2009).

#### Computer-based Instruction

Stoner, Beck, Dennis, and Parette (2011) conducted research with 30 preschoolers, ages 3 and 4, at-risk for academic and social-emotional failure. A total of

60 nouns, 30 animal vocabulary words and 30 transportation vocabulary words were taught with Boardmaker pictures. The study had a pretest, an intervention, and a posttest phase for each instructional condition, using static pictures and using instructional technology (IT). In addition, students' maintenance was assessed 12 weeks after the final posttest session. Pretests, posttests, and maintenance sessions all utilized the same tasks: verbal identification of the picture and fluency recall. In each measurement session, each child was first asked to name all the items within a category (i.e., animals or transportation) that he or she could think of in one minute and to name aloud each of the 30 pictures within a category, which were shown to the learner one at a time (Stoner, Beck, Dennis, & Parette, 2011).

During the intervention, participants in Classroom A received instruction using IT on the animal vocabulary unit, and participants in Classroom B received instruction using static pictures. Posttests were conducted the week after the first intervention phase. The entire procedure of pretest, intervention for four weeks, and posttest was then repeated and the interventions for each classroom were reversed. Therefore, participants in Classroom A received instruction on the transportation vocabulary unit using static pictures, and participants in Classroom B received instruction on the transportation vocabulary unit using IT (Stoner, Beck, Dennis, & Parette, 2011).

In the static group, a teacher first read a vocabulary book that corresponded to the unit, either animals or transportation, to the children. There were four books for each unit. The first book was read during both sessions in Week 1 and the first 15 vocabulary words of the unit were taught. The second book was read during both sessions in Week 2 and the second 15 vocabulary words were taught. The third book was read during both



sessions in Week 3 and the first 15 vocabulary words were reviewed, and the fourth book was read during both sessions in Week 4 and the second 15 vocabulary words were reviewed. During reading, the teacher held the book so that all children could see the pages, and they be encouraged to ask questions or make comments. The teacher read each page and then asked questions about the material, such as, "Have you ever seen XX?" The same procedure was used with each book reading (Stoner, Beck, Dennis, & Parette, 2011).

The IT instruction followed the same procedures as the static picture instruction, except Boardmaker pictures were used instead of static pictures. Specifically, the books were projected onto a screen instead of being shown to the children a regular book. The teacher operating the computer put children's choices of vocabulary word and action into the Intellitools Classroom Suite, animated the vocabulary word using the action given, and projected the image onto the screen. For example, if the choices were birds and flying, then birds were projected onto the screen and the flying action was animated. The children watched the animation and imitated the action (Stoner, Beck, Dennis, & Parette, 2011).

Results show that the students made significant progress from pretest to posttest, regardless of the instructional method used. Pre- and posttest scores for both groups were compared. All students gained in the posttest, regardless of the intervention used (Stoner, Beck, Dennis, & Parette, 2011).

Further, computer games were used to teach adult ELLs to independently learn vocabulary words (Abu Bakar & Nosratirad, 2013). Three adults, ages 23-29, participated in this two-month's study. All participants were computer-literate and had

access to the internet. Participants were instructed to play the video game, SIM 3 because it simulates real-life in that the players control their own Sims' activities and relationships. Players have the ability to select desired character traits, build homes, find jobs and establish relationships.

Results show that computer games can help adult ELLs acquire vocabulary words independently. Computer games can be a tool for self-study and create an independent learning environment for adult learners. The game was free online for learning vocabulary related to various aspects of the learner's daily life and regular conversations (Abu Bakar & Nosratirad, 2013).

**Smart Board.** Smart Boards are a brand of interactive electronic whiteboards linked with a projector and computer to enhance teaching and learning. It displays an image from the computer monitor with a giant touch screen surface. It is popular in schools for teachers to introduce lessons, integrate activities in teaching and learning sequences, reinforce key ideas, conclude lessons, and provide assessments in all content areas. However, because it is a new technology tool, little research has been conducted to evaluate its effects on students' learning vocabulary, especially those with disabilities. One of the few studies found was for teaching social stories. For example, Xin and Sutman (2011) investigated the effectiveness of using a Smart Board to teach social stories for students with autism spectrum disorders (ASD). These students struggle with communication skills and social interactions, and social stories are developed to teach these students learning social skills. Computer technology with the Smart Board was used in the process to enhance their learning because students with ASD are usually strong visual learners.

Two, 9 year old students participated in this study. The boy had limited verbal communication and required the use of picture exchange communication system (PECS). The girl had language skills on target for her age and did well academically. However, she struggled with social interactions with her peers. Two special education teachers developed social stories with digital self-modeling images that could be demonstrated on the Smart Board. This allowed children with ASD to easily observe, imitate, review, and practice each desired appropriate behavior. Each teacher taught a social story to an individual student, using the slides of images that modeled the appropriate behavior. With the teacher's support, each student learned to touch the screen to view the slides of the modeling images. This computer-assisted practice in learning through social stories was helpful in teaching social communication skills to children with ASD.

Results show that both children benefited from their experience of using the Smart Board to learn social skills. For example, prior to the intervention, the boy made noises about 15 times and hummed 20 times a day. During the intervention, his humming decreased to 8 times and he learned to raise his hand. The girl had limited verbal responses or interaction with her peers prior to intervention. During the intervention, her verbal initiation increased and she learned to request, and approach her peers by waving her hand to show her interest and verbal initiation (Xin & Sutman, 2011).

To date, limited research has been conducted to investigate the effectiveness of using an interactive Smart Board in vocabulary instruction, though this electronic whiteboard is used popularly in school.

## **Summary**

This review of literature summarized various vocabulary instructional methods including definitional, keyword, and using technology. The myriad of vocabulary approaches has resulted in the acquisition of words and improvement of reading comprehension. However, they differ in effectiveness on the increase of student motivation and interest. The definitional method is a “tried and true” traditional approach, but is generally considered boring in the eyes of today’s tech-savvy students, who seem to have an insatiable need to keep busy with hands-on activities. The keyword method was once innovative and certainly more hands-on than the traditional approach. However, most studies on keyword methods only focused on teaching nouns which seem easy to find visual images to illustrate meanings. Various technology tools are used in the classroom to captivate the students’ interest and make teaching and learning a smoother, more enjoyable journey, while limited studies to evaluate their effects on secondary students’ learning, especially those with learning disabilities.

Using the Smart Board in vocabulary instruction will be the focus of this study. It attempts to evaluate its effects on vocabulary instruction in inclusive settings for secondary students with and without disabilities.

## CHAPTER 3

### METHODS

#### **Participants and Setting**

A total of fifty-eight 8th grade students, in an inclusive classroom in a middle school in a suburban area participated in this study. The students (19 LD and 39 without disabilities), range from ages 13-14 and come from various ethnic backgrounds (e.g., African American ( $n=10$ ), Asian ( $n=2$ ), Hispanic ( $n=5$ ), and Caucasian ( $n=41$ )). The study was conducted during an English Language Arts class. The students are divided into three classes, each class is 80 minutes. Since this is an inclusion class, there are two teachers in the classroom at all times, one general education teacher and one special education teacher. In the first class, there are 20 students, 12 without disabilities and 8 with LD. There are 21 students in the second class, 14 without disabilities and 7 with LD. In the third class, there are 17 students, without disabilities and 4 with LD (see Table 1).

All students follow a schedule divided into nine periods comprising of English Language Arts, Math, Social Studies, Science, a special (i.e., foreign language, music, art, and computers) which changes each marking period, Physical Education for three marking periods and Health Education for one marking period, and lunch. Block scheduling is implemented for English Language Arts and Math, so the students have these subjects for two consecutive periods (80 minutes) and all other subjects are a duration of 40 minutes.

Some of the students require related services. In the first class, 3 of the 8 classified students attend speech therapy sessions, 4 of the 8 attend counseling sessions,

and 1 of the 8 attend individual Wilson Reading Program tutoring sessions two hours a week after school. In the second class, 1 of the 7 classified students attend speech therapy sessions, 3 of the 7 attend counseling sessions, and 1 of the 7 attend individual Wilson Reading Program tutoring sessions two hours a week after school. In the third class, 1 of the 4 classified students attend speech therapy sessions and 3 of the 4 attend counseling sessions.

All students in one of the three class were asked to participate in this study. The selection criterion for this study required that (1) the student is assigned to be in one of the three classes and (2) the parent/guardian of the student signed a permission slip, allowing the student to participate.

Table 1

*Participant Information*

Class	Periods of Instruction	# of General Ed Students	# of LD Students	Gender	Ethnicity	Total
1	Periods 1-2	12	8	13 Male 7 Female	6 African American 1 Hispanic 13 White	20
2	Periods 3-4	14	7	11 Male 10 Female	4 African American 1 Asian 1 Hispanic 15 White	21
3	Periods 7-8	13	4	11 Male 6 Female	1 Asian 3 Hispanic 13 White	17

**Variables**

**Independent Variable.** The keyword method for vocabulary instruction was implemented using two different modes: (1) Original method by using pencil and index cards to create the familiar word and image associations and (2) Technology intervention by using the Smart Board to create the familiar word and image associations. The effectiveness of this intervention will be compared to the effectiveness of a traditional approach for vocabulary instruction.

**Dependent Variable.** Vocabulary knowledge and application of vocabulary words of students with and without LD by using the *Vocabulary for Success* program (Fisher & Frey, 2011) were measured. This instruction and assessment program was used because it is part of the current English Language Arts curriculum implemented in the school.

The vocabulary assessment was in the form of a written test, administered at the end of each week, with a total of twelve tests administered throughout the study. Each test is comprised of 25 questions and are worth four points each, totaling 100 points. Every four weeks (duration of each phase) the data will be calculated to find a mean score. The three mean scores will be compared.

In addition, students' survey (see Appendix C) data was collected during the final of week of intervention. The purpose of this survey is to gather feedback about the phases from the participants. The survey was developed by the researcher. The survey includes questions asking the effectiveness of each method, the ease of each method, and the level of interest in each method.

## **Instruments**

**Traditional Method.** The traditional method was used for the first 4 weeks during the baseline phase. During this time, students were provided activities in a workbook called, *Vocabulary for Success* (Fisher & Frey, 2011). This workbook includes various activities so that students are able to demonstrate their knowledge of the words and ability to apply the vocabulary words. The workbook is organized into themed lessons, (e.g., *Why Explore Space?*). Additionally, these themed lessons are aligned with the Common Core State Standards (Fisher & Frey, 2011). There are 6



activities in each lesson (see Appendix A). The first activity “Word Meanings” contains a list of the 10 vocabulary words. Next to each word is a sentence including the word and its definition, however 3-4 words have a second meaning. The students are required to read each words and sentences and highlight the definition in each sentence. In the second activity, “Word Talk” the students are provided with each word placed in a category. Students need to list items that belong in each category. For example, the vocabulary word treacherous, the category is “treacherous situations”. Students need to list situations considered to be treacherous. The third activity “Check for Understanding” required the students to complete 12 sentences by writing the correct lesson in word in each blank and some words will be used more than once. The fourth activity “Expand Word Meanings” provides the students with a small paragraph to which includes 3-4 lesson words which have a second meaning. The paragraph helps the students learn the second meaning of these words. After reading the paragraph, the students are required to complete 10 fill-in the blank sentences using only the 3-4 lesson words in the paragraph. This helps students understand how each word can be used in more than one context. The fifth activity “Word Associations” requires students to apply their understanding of the meanings of the vocabulary words. This page provide 10 multiple choice questions, requiring the student to make word associations. For example, for the vocabulary resolve, the question is “Which of these things might someone resolve to do?”. The sixth and final activity “Practice for Tests” is very similar to “Word Associations” activity and a section on the test. This section is multiple-choice and requires students to demonstrate mastery of word meanings in standardized-test format. For instance, a question says, “Read this sentence. The heavy snowfall forced the city to suspend regular bus service.

Suspend means: Vocabulary for Success (Fisher & Frey, 2011) also provides tests for each lesson. The tests assess definition recall and application of definition via fill-in-the-blanks and multiple-choice questions. Each test is comprised of 25 questions and are worth four points each, totaling 100 points.

**Keyword Method.** The keyword method was implemented for the second 4 weeks after the 4 weeks of the baseline phase. Students were given the first activity “Word Meanings” from the Vocabulary for Success workbook (Fisher & Frey, 2011). Similar to the baseline phase, students are required to read each words and sentences and highlight the definition in each sentence. Then, 10 3x5 index cards administered so that the students can complete the keyword method by writing the keyword and drawing a picture on the index card. The students were given the same test as during the baseline phase. The tests assess definition recall and application of definition via fill-in-the-blanks and multiple choice questions. Each test is comprised of 25 questions and are worth four points each, totaling 100 points.

**Keyword Method and Smart Board.** This intervention was implemented for a duration of 4 weeks. Students were given the first activity “Word Meanings” from the Vocabulary for Success workbook. Similar to the baseline phase and keyword phase, students are required to read each words and sentences and highlight the definition in each sentence. Then students use the Smart Board, which is connected to a laptop, to write a keyword and draw or a picture using the SMART Notebook Software. A new notebook has a similar appearance to a Microsoft Word Document, except has many interactive features, including drawing on the page using a Smart Board pen. Students may choose to find a picture on the internet instead of drawing one.

## **Measurement Materials**

**Vocabulary Assessment.** The tests are part of the Vocabulary for Success program (Fisher & Frey, 2011). Each test assesses vocabulary knowledge and application of word meanings for the 10 lesson words. Tests consist of 25 questions, separated into three sections. Section A has 10 definitional recall questions. The student must write the word that best matches each meaning (word bank is provided). Section B has 5 sentences in which students must complete by writing the correct lesson word in the blank (a word bank is provided). The last portion, Section C, has 10 multiple choice questions. The student must apply their understanding of the meanings of the words to best complete each sentence or answer the question (see Appendix B). The tests were administered on Day 5, after four days of instruction. Each test is comprised of 25 questions and are worth four points each, totaling 100 points.

## **Procedures**

The length of the study was 12 weeks. The traditional method was implemented the first four weeks. During the next four weeks, the keyword method was implemented. Finally, during the last 4 weeks, keyword method with the Smart Board was implemented. Ten words were the focus for one week, totaling in 120 words for the duration of the study. At the end of the week, students completed a test.

Each class completed each phase (described below) using a different list of ten words each week for four weeks. Each phase consisted of one lesson per day for the first four days of each training week, followed by a test on the fifth day. Each lesson lasted between 15 and 20 minutes. All three phase were implemented to all the students in the three classes. In order to control for teacher effects, all lessons were taught by the

researcher or her co-teacher, who has received training on the three methods. On the fifth day, each student completed the vocabulary test.

**Traditional Method.** During weeks 1-4 (Phase A), the traditional method was implemented through activities provided in the Vocabulary for Success workbook. On Day 1, students completed the first two activities, “Word Meanings” and “Word Talk”. The first activity “Word Meanings” contains a list of the 10 vocabulary words. Next to each word is a sentence including the word and its definition, however 3-4 words have a second meaning. The students are required to read each words and sentences and highlight the definition in each sentence. In the second activity, “Word Talk” the students are provided with each word placed in a category. Students need to list items that belong in each category. For example, the vocabulary word treacherous, the category is “treacherous situations”. Students need to list situations considered to be treacherous. On Day 2, students completed activity three, “Check for Understanding”. This activity required the students to complete 12 sentences by writing the correct lesson in word in each blank and some words will be used more than once. On Day 3, students completed activity four, “Expand Word Meanings”. This activity provided the students with a small paragraph to which includes 3-4 lesson words which have a second meaning. The paragraph helps the students learn the second meaning of these words. After reading the paragraph, the students are required to complete 10 fill-in the blank sentences using only the 3-4 lesson words in the paragraph. This helps students understand how each word can be used in more than one context. On Day 4, students completed the last two activities. The fifth activity “Word Associations” requires students to apply their understanding of the meanings of the vocabulary words. This page provide 10 multiple

choice questions, requiring the student to make word associations. For example, for the vocabulary resolve, the question is “Which of these things might someone resolve to do?” The sixth and final activity “Practice for Tests” is very similar to “Word Associations” activity and a section on the test. This section is multiple choice and requires students to demonstrate mastery of word meanings in standardized-test format. For instance, a question says, “Read this sentence. The heavy snowfall forced the city to suspend regular bus service. Suspend means:”

On each day, students were given 15 minutes to individually complete the activities and then the teacher reviewed the answers in a whole group setting by having students participate and share their answers. Students were instructed to make corrections to any errors and encouraged to ask questions for clarity.

On Day 5, a test was administered to assess the 10 vocabulary words. Students sat in desks, which were positioned in rows. Additionally each student was provided a privacy partition. As tests were passed out the teacher said, “Make sure you read directions to all parts of the test. Make sure you complete both sides of the test. Take your time. You may being. Students were not given a time limit to complete the test, though students completed the test in within 35 minutes.

**Keyword Method.** This intervention (Phase B) provides the students with a keyword, sounding similar to the target word, and an image that links the keyword and the meaning of the target word. On the first day, students completed the “Word Meanings” activity the same way as in Phase A. Next, the students were given 20 minutes to write a keyword and draw an image on a 3x5 index card for the first 5 words on the list. While the teachers completed this task, teachers circulated to ensure that the

students were following the correct guidelines for this method. On the second day, the students were given 15 minutes to review the 5 index cards. On the third and fourth days, these procedures were repeated with the second set of five words, so that ten words were taught each week. On Day 5, a test was administered to assess the 10 vocabulary words. Students sat in desks, which were positioned in rows. Additionally each student was provided a privacy partition. As tests were passed out the teacher said, “Make sure you read directions to all parts of the test. Make sure you complete both sides of the test. Take your time. You may being. Students were not given a time limit to complete the test, though students completed the test in within 35 minutes.

**Keyword Method with Smart Board.** The same procedures were followed as during the keyword method. However, students used the interactive Smart Board to write the keyword and draw the image. Students were allowed to choose to find an image on the internet instead of drawing one.

### **Research Design**

A subject design across classes with ABC phases was used. During the baseline, phase A, a traditional approach was used for 4 weeks. During intervention 1, phase B, the keyword method was used for 4 weeks. During intervention 2, phase C, the keyword method with Smart Board was used for 4 weeks. Students’ test scores at the end of each week of each phase were recorded and compared. In addition, a survey was administered to students to learn about their experiences in all three phases.

## CHAPTER 4

### RESULTS

This study examined the effectiveness of the use of the keyword method with and without the interactive Smart Board in vocabulary instruction. Table 2 shows means of test scores during all three phases of the study: (A) baseline phase, (B) keyword method, and (C) keyword method with interactive Smart Board. Results indicate that test scores in all three phases are similar. Class 1 has a mean score of 85% during the baseline phase and the first intervention, keyword method. There is a slight decrease during the third phase, keyword method with Smart Board, with a mean score of 83%; however, it is not significant. Class 2 has a mean score of 89% during the baseline phase. There was a slight difference during the second and third phases with a mean score of 86% using both interventions. Class 3 has a mean score of 87% during all three phases of the study. In addition, a survey was administered to participants to gather information about their experiences using these interventions. The summary of the survey results is presented in table 4. The results indicate that the majority of participants, 73%, feel that the most interesting and fun way to learn vocabulary words is by using the keyword method with the Smart Board. Only 23% felt the baseline phase was the most interesting and fun and <4% felt the keyword method was the most interesting and fun. In contrast, 50% of the participants agreed that the baseline phase was the most useful way to learn vocabulary words. Only 13% felt the keyword method and 38% felt the keyword method with the Smart Board was the most useful way to learn vocabulary words. However, 45% of participants agreed that the baseline phase made them feel most prepared for the vocabulary tests and 45% agreed the keyword method with the Smart Board made them

feel most prepared for the vocabulary tests. Only 11% felt the keyword method made them feel most prepared for the vocabulary tests. Additionally, 48% of the participants agree that they will use image associations as a tool to learn vocabulary words in the future.

Table 2

*Means of Test Scores*

Class	Baseline Phase				Intervention 1				Intervention 2			
	Weeks				Weeks				Weeks			
	1	2	3	4	5	6	7	8	9	10	11	12
1	86	80	92	82	82	86	86	86	81	90	80	83
2	92	87	91	85	82	89	84	88	86	91	79	87
3	88	82	95	83	84	91	86	87	85	92	83	88



Table 3

*Means of LD Test Scores and General Education Test Scores*

Class	LD or Gen Ed	Baseline Phase				Intervention 1				Intervention 2			
		Weeks				Weeks				Weeks			
		1	2	3	4	5	6	7	8	9	10	11	12
1	LD	82	71	88	72	70	83	77	83	69	82	73	75
	Gen Ed	89	87	95	89	91	88	93	88	88	96	8	89
2	LD	88	77	83	81	73	84	83	89	81	85	69	81
	Gen Ed	94	92	94	87	88	92	85	87	88	95	84	90
3	LD	81	73	90	76	76	93	85	86	76	87	76	83
	Gen Ed	90	85	97	85	87	90	86	87	87	93	86	89

Table 4

*Results of Student Survey*

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
English Language Arts is my favorite subject.	16%	23%	46%	14%
I enjoy English Language Arts class.	25%	50%	20%	7%
My favorite part about English Language Arts is learning vocabulary words.	11%	28%	57%	<4%
I feel it is very easy to learn vocabulary words, regardless of the strategy I use.	25%	48%	25%	<2%
I typically receive a grade of A or B in English Language Arts class.	45%	27%	25%	<4%
Using image associations with vocabulary words is a tool I will use in the future.	7%	48%	32%	13%
	<i>Vocabulary for Success</i>	Keyword Method	Keyword Method & Smart Board	
The most interesting and fun way to learn vocabulary words is:	23%	<4%	73%	
The most useful way to learn vocabulary words is:	50%	13%	38%	
I felt most prepared for my vocabulary test when I used:	45%	11%	45%	

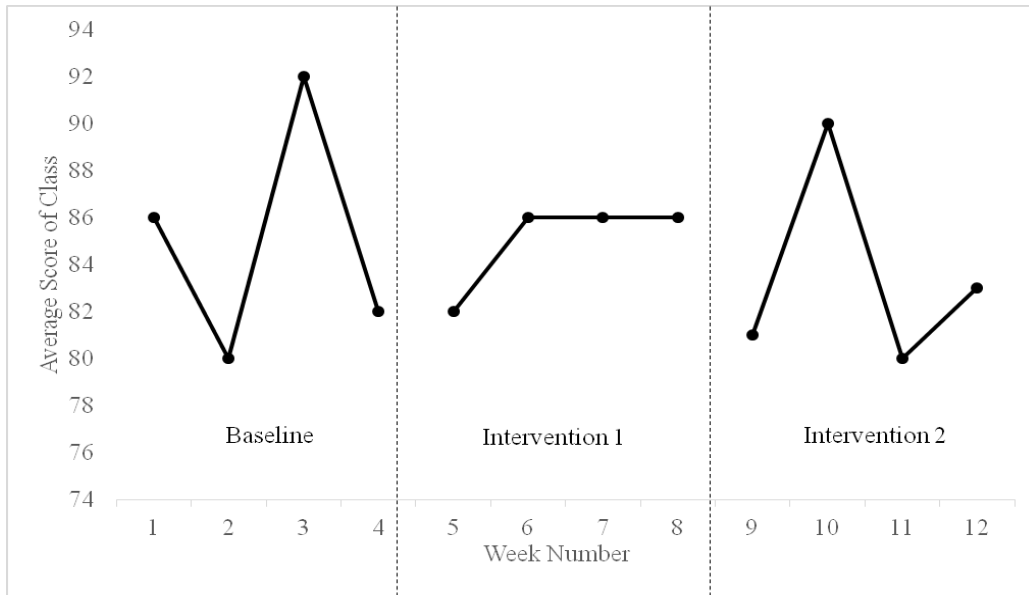


Figure 1. Mean Scores of Class 1

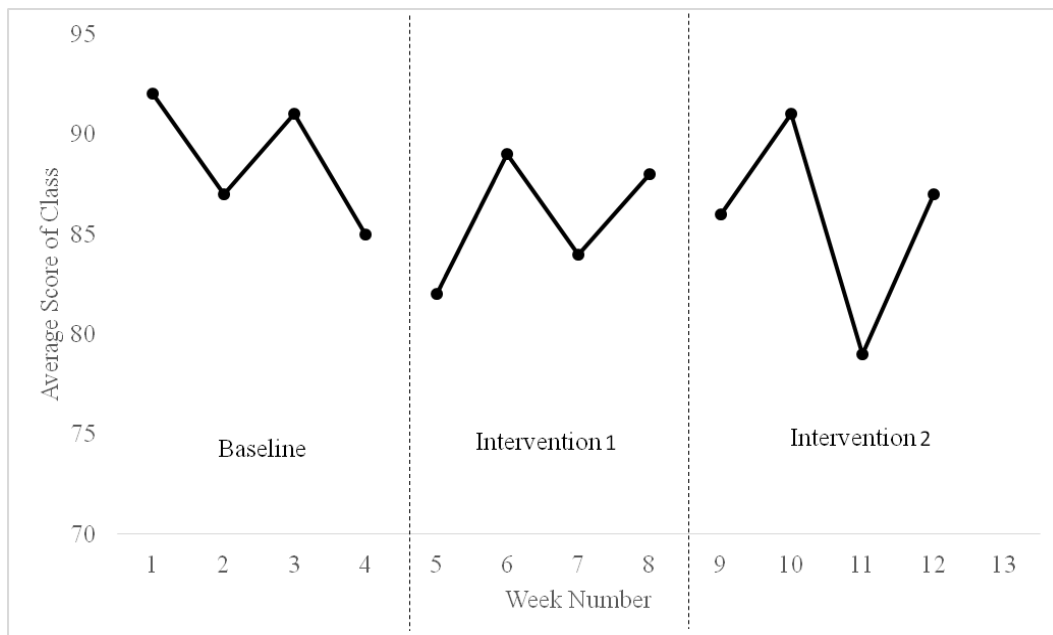
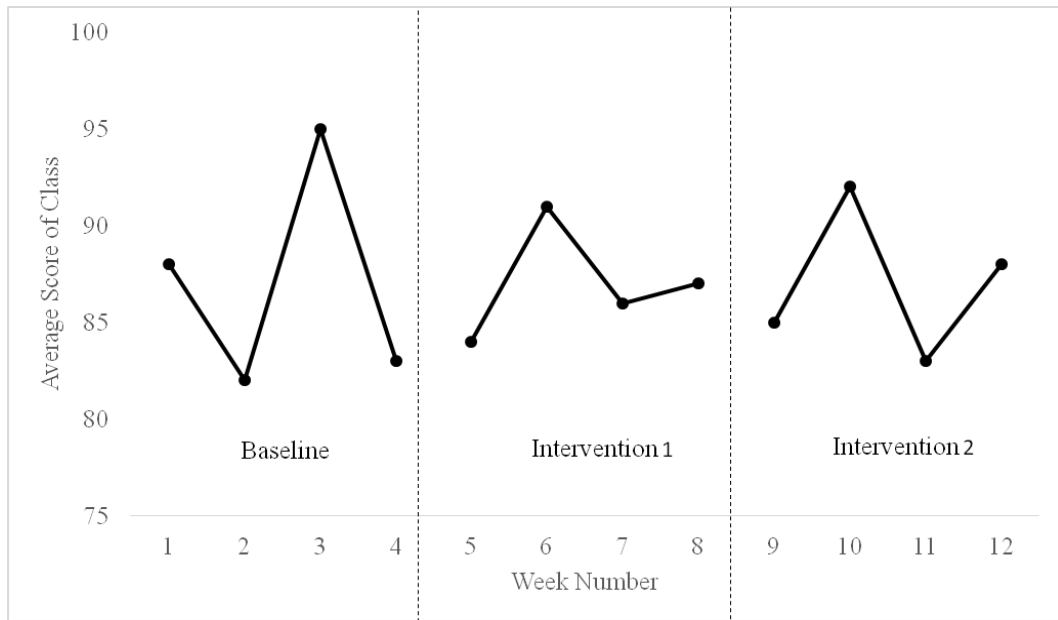


Figure 2. Mean Scores of Class 2



*Figure 3.* Mean Scores of Class 3

## CHAPTER 5

### DISCUSSION

This research questions of the study were: (1) are there any differences in vocabulary knowledge of students with and without learning disabilities taught using a traditional approach as compared with those using the keyword method, the keyword method with the Smart Board?, (2) are there any differences in application of vocabulary words of students with and without learning disabilities taught using a traditional approach as compared with those using the keyword method, and the keyword method with the Smart Board?, and (3) are there any differences in satisfaction of students with and without learning disabilities taught using a traditional approach as compared with students using the keyword method, and the keyword method with the Smart Board?

For the first research question, the study found there was no significant difference in vocabulary knowledge of students with and without learning disabilities taught using a traditional approach compared with using the keyword method with and without the Smart Board. Furthermore, the study found there is no significant difference in application of vocabulary words of students with and without learning disabilities taught using a traditional approach compared with using keyword method with and without the Smart Board. As for the third question, the survey found that most students with and without LD, 73%, prefer using the keyword method with the Smart Board because they find it more enjoyable and fun.

#### **Limitations and Future Research**

Limitations of this study include variables (e.g., student motivation, student interest, prior knowledge of the words, and the learning environment) which may have

impacted students' test scores. The survey shows that 46% of students disagree that English Language Arts is their favorite subject. 57% of the student disagree that learning vocabulary words is their favorite aspect in English Language Arts. Therefore, many of the participants had little interest and motivation in learning vocabulary words. In contrast, students who are interested in learning vocabulary words may have done additional studying outside of the classroom, though they were not instructed to do so. Some students may have already had knowledge of some of the words. Consequently, if students were already familiar with some of the words, they may do well on the test, regardless of the strategy used to learn the words.

Furthermore, variables in the learning environment may have affected the outcome of this study. Throughout the twelve weeks of this study, three new students were added to the classes. Two of the students were added the Class 1 and one students was added to Class 2. New students can change the dynamic of the class and impact the learning of students. Additionally, there were several snow days this school year and unfortunately were disruptive to the study.

Lastly, an important aspect to point out is that this study included vocabulary words of various parts of speech (i.e., nouns, verbs, adjectives, and adverbs) and all previous studies of the keyword method only used nouns. Using the keyword method to learn words other than nouns, can be challenging; and therefore, may have made the interventions less effective. The limitations of this study indicate that further research is necessary. Future research studies should eliminate the variables, such as only using students with no prior knowledge of the vocabulary words or only using nouns, to gather more reliable data.

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## Appendix A Vocabulary for Success Workbook Activities

### Word Meanings

For each highlighted word on pages 36–37, the meaning is given below. For practice with other meanings, see pages 41–43. For synonyms and antonyms, see page 66.

1. **occupied**  
(AW-kyuh-pyed) (v.) A building that is *occupied* is lived in or used for a specific reason, such as for work.
2. **moral**  
(MOR-uhl) (adj.) *Moral* has to do with right and wrong. If you have *moral* reasons for doing something, your reasons are fair and reasonable.  
(n.) A *moral* is a lesson that you learn from a story or from life.
3. **displaced**  
(diss-PLAYST) (adj.) *Displaced* objects or people have been taken from, or forced to move out of, their usual location or home.
4. **ration**  
(RA-shuhn) (v.) When you *ration* something, you limit it or distribute it equally. When you *ration* your time, you organize it so you can do everything you need to do.  
(n.) A *ration* is a share, such as a certain amount of food for a day.
5. **restrained**  
(ri-STRAYND) (adj.) Someone who is *restrained* has control over his or her emotions, or displays limited or restricted emotions. A *restrained* person is calm.
6. **founder**  
(FOUN-dur) (n.) A *founder* is someone who establishes something or brings it into being. A *founder* might start a business or a dance group.  
(v.) Something will *founder* when it collapses, sinks, or fails in some way. A horse will *founder* when it goes lame; a ship might *founder* if it hits a reef.
7. **prominent**  
(PRO-muh-nuhnt) (adj.) Something that is *prominent* is noticeable. People who are *prominent* are well known or leaders in their field.
8. **illusion**  
(i-LOO-zhuhn) (n.) An *illusion* is a mistaken impression or belief.  
(n.) An *illusion* is an image in your mind that is not real or an image that doesn't show things as they really are.
9. **enhance**  
(en-HANSS) (v.) When you *enhance* something, you increase its quality or make it better in some way. A flower garden can *enhance* the appearance of a home.
10. **harmony**  
(HAR-muh-nee) (n.) When something has *harmony*, its parts are arranged so that they are pleasing. Similarly, things in *harmony* are balanced and in agreement.  
(n.) Musical notes that are pleasing when played together create *harmony*.



## Word Talk

Each lesson word has been placed in a category. With a partner, discuss and list items that belong in each category. Compare your results with those of another pair of students.

People Who Played a Role in the *Founding* of the United States

*Prominent* People of Today

People Who *Occupy* the House Where I Live

Reasons People Have *Illusions*

*Moral* Behaviors

Things That People *Ration*

Things That Are in *Harmony*

Features That Can *Enhance* a Car

Times When I Have to Be a *Restrained* Person

Reasons a Person Might Become *Displaced*

## Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

displaced

harmony

prominent

enhance

illusion

ration

founder

moral

restrained

occupied

1. Because I believe that cheating is always wrong, I do not do it for \_\_\_\_\_ reasons.
2. Five families \_\_\_\_\_ the apartment building on Fifth Street.
3. \_\_\_\_\_ persons must find safety and shelter when they leave their home country.
4. The florist will \_\_\_\_\_ the simple bouquet by adding roses and a ribbon.
5. My grandfather was a/an \_\_\_\_\_ member of our community who was known and respected by everyone.
6. Aunt Bess is a/an \_\_\_\_\_ person who seldom lets her feelings show.
7. All the paintings in the exhibit are in \_\_\_\_\_ with one another, because they are from the same time period.
8. The bank, which opened in 1912, proudly displays a picture of its \_\_\_\_\_.
9. I \_\_\_\_\_ my time so I can study and spend a few hours with my friends.
10. The result of the hurricane was that there were many \_\_\_\_\_ people.
11. Jason almost never practiced, so his idea of becoming a famous concert pianist was just a/an \_\_\_\_\_.
12. The \_\_\_\_\_, award-winning scientist spoke at a conference about nuclear energy.



## Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

After the singer moved to London, she was very unhappy.

"I'd seen the city portrayed in movies," she said, "and it was always beautiful and clean. But the picture in my mind was an illusion compared to the reality I experienced. My building was unattractive and my street was dirty. Worse, I couldn't find anyone to practice singing harmony with, and I had so little money, I had only a small ration of food each day. I was about to founder like a leaky ship at sea. Then I got my first singing job, and everything began to improve. Today, I love the city. The moral of my story is to be patient because things will work out!"

Some of the words in the lesson are used in a different way here. For example, look at *illusion*. Here it means "an image that doesn't show things as they really are." Look at the other highlighted words. Can you figure out the meanings of the words as they are used here? Refer to page 38 to confirm meanings.

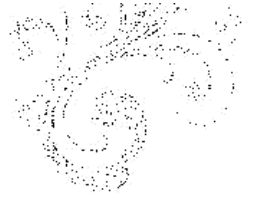
### Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. County engineers closed the old bridge to trucks because they worried it would \_\_\_\_\_ under the weight of the vehicles.
2. The hiker was very cold and imagined he saw a huge campfire on the trail ahead of him, but it was just a/an \_\_\_\_\_.
3. The old folktale presents a/an \_\_\_\_\_ that today's readers can apply to their lives.
4. I love how it sounds when my friends and I sing \_\_\_\_\_ together.
5. A small \_\_\_\_\_ of water was all that the patient was allowed when she came out of surgery.
6. I learned a lesson after having to study until midnight, and that \_\_\_\_\_ was to always plan ahead.
7. Each passenger's small \_\_\_\_\_ of pretzels has to last the entire flight.
8. I didn't want our friendship to \_\_\_\_\_, so I apologized to my teammate for my selfish behavior.
9. I enjoy musical groups that create \_\_\_\_\_ with their voices instead of instruments.
10. The optical \_\_\_\_\_ tricked Jonathan into seeing an image that wasn't there.

## Word Associations

Use what you know about the lesson word in *italics* to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.



1. Which event might cause many pets to become *displaced*?
  - a. vacation
  - b. festival
  - c. hurricane
2. Which item is an *illusion*?
  - a. sunset
  - b. dream
  - c. magician
3. Which people usually exist in *harmony* with each other?
  - a. enemies
  - b. friends
  - c. strangers
4. In which text would you find a *moral*?
  - a. fable
  - b. encyclopedia article
  - c. how-to manual
5. During which event is the audience most *restrained*?
  - a. hockey game
  - b. ballet performance
  - c. political rally
6. Which would *enhance* the atmosphere of a restaurant?
  - a. kitchen noises
  - b. crowded dining room
  - c. pleasant music
7. Which people might have to *ration* food and drinks?
  - a. family on a picnic
  - b. hikers lost in the woods
  - c. students in a large school
8. Which vehicle is most likely to *founder*?
  - a. a new bike
  - b. a large truck
  - c. an old car
9. Which person is a *prominent* member of a hospital staff?
  - a. chief of surgery
  - b. student volunteer
  - c. part-time assistant
10. Which of the following is NOT being *occupied*?
  - a. a full hotel
  - b. a busy office
  - c. an empty lot





## Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

The *moral* of the story taught me that an act of kindness is never wasted.

In this sentence, *moral* means:

- A conclusion
- B hero
- C lesson
- D what is right

2. When you *enhance* your vocabulary, it:

- A gets better
- B gets worse
- C stays the same
- D confuses others

3. The opposite of *restrained* is:

- A calm
- B emotional
- C controlled
- D shy

4. Which space in a house is *occupied* by the most people?

- A the garage
- B the dining room
- C a closet
- D the attic

5. Someone might be *displaced* by:

- A an election
- B war
- C a new job
- D bad neighbors

6. Read this sentence.

The *prominent* teachers were featured in many newspaper articles.

*Prominent* means:

- A experienced
- B well-known
- C untrained
- D promising

7. A boat will *founder* when it:

- A sails
- B races
- C sinks
- D floats

8. When something is an *illusion*, it is NOT:

- A true
- B false
- C imaginary
- D visible

9. A word closely associated with *harmony* is:

- A conflict
- B pair
- C difference
- D agreement

10. What would a mountain climber *ration*?

- A rope
- B energy
- C helmet
- D safety

## Appendix B Vocabulary for Success Test

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

### Tania Léon Follows Her Music



displaced      founder      illusion      occupied      ration  
enhance      harmony      moral      prominent      restrained

**A.** From the Word Bank above, choose the word that best matches each meaning. Write the word on the line provided.

- \_\_\_\_\_ Having to do with right and wrong
- \_\_\_\_\_ Forced to leave home
- \_\_\_\_\_ A person who establishes something
- \_\_\_\_\_ Having control over emotions
- \_\_\_\_\_ Noticeable or well known
- \_\_\_\_\_ To increase the quality of something or make it better
- \_\_\_\_\_ An arrangement of parts that makes something pleasing or balanced and in agreement
- \_\_\_\_\_ A mistaken impression or belief
- \_\_\_\_\_ To limit or distribute something equally
- \_\_\_\_\_ Resided or lived in as an owner or tenant

**B.** Choose one of the words in the Word Bank above to complete each sentence. Write the word on the line provided.

- We watched the toy sailboat \_\_\_\_\_ and then sink in the pool.
- The image of ourselves that we carry in our heads is often a/an \_\_\_\_\_ and very different from what others see.
- Most of the piano students preferred to play familiar tunes, but Kara liked to play chords and listen to the \_\_\_\_\_ they created.
- Our dog would eat two times his daily \_\_\_\_\_ of food if we let him.
- I like to read fables and guess the \_\_\_\_\_ the story is trying to tell me.

**C.** Fill in the bubble next to the answer that best completes the sentence or answers the question.

16. People who are *displaced* have been
- A offered different jobs
  - B moved from their regular homes
  - C voted into political office
  - D asked politely to leave

17. Read this sentence:

They planted the rosebush in a *prominent* place in their garden.

*Prominent* means

- A noticeable
  - B hilly
  - C well cared for
  - D fenced
18. A person who is *restrained* would NOT
- A say "Thank you"
  - B behave calmly
  - C act like a clown
  - D be polite
19. The opposite of *occupied* is
- A empty
  - B uncommon
  - C quiet
  - D frequent
20. If ideas are in *harmony*, they are
- A related to music
  - B in great contrast
  - C pleasing to everyone
  - D in agreement

21. Read this sentence:

Tomas lives with the *illusion* that everyone's family is exactly like his.

An *illusion* is a/an

- A mental picture
  - B firm belief
  - C happy thought
  - D incorrect idea
22. If a story has a *moral*, it
- A has characters who are good
  - B has a happy ending
  - C teaches a lesson
  - D has a conflict
23. The *founder* of a company
- A created the company
  - B works for the company
  - C caused the company to fail
  - D is in competition with the company
24. You might *ration* your food if you
- A had too much food
  - B didn't want others to eat it
  - C didn't want to eat too much
  - D were very hungry
25. What could *enhance* the appeal of a room?
- A old curtains
  - B dirty carpeting
  - C colorful flowers
  - D a table and chairs

## Appendix C Student Survey

Please circle one response to following statements.

1. English Language Arts is my favorite subject.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

2. I enjoy English Language Arts class.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

3. My favorite part about English Language Arts is learning vocabulary words.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

4. I feel it is very easy to learn vocabulary words, regardless of the strategy I use.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

5. I typically receive a grade of A or B in English Language Arts.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

6. Using image associations with vocabulary words is a tool I will use in the future.

Strongly Agree	Agree	Disagree	Strongly
Disagree			Disagree

7. The most interesting and fun way to learn vocabulary words is:

<i>Vocabulary for Success</i>	Keyword Method	Keyword & Smart
Board		Board

8. The most useful way to learn vocabulary words is:

*Vocabulary for Success*  
Board

Keyword Method

Keyword & Smart

9. I felt most prepared for my vocabulary test when I used:

*Vocabulary for Success*  
Board

Keyword Method

Keyword & Smart