

Rowan University

Rowan Digital Works

Theses and Dissertations

6-28-2018

The effectiveness of the keyword method on foreign language vocabulary for students with learning disabilities

Jessica Anna Consiglio
Rowan University

Follow this and additional works at: <https://rdw.rowan.edu/etd>



Part of the [Special Education and Teaching Commons](#)

Recommended Citation

Consiglio, Jessica Anna, "The effectiveness of the keyword method on foreign language vocabulary for students with learning disabilities" (2018). *Theses and Dissertations*. 2581.
<https://rdw.rowan.edu/etd/2581>

This Thesis is brought to you for free and open access by Rowan Digital Works. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Rowan Digital Works. For more information, please contact graduateresearch@rowan.edu.

**THE EFFECTIVENESS OF THE KEYWORD METHOD ON FOREIGN
LANGUAGE VOCABULARY FOR STUDENTS WITH LEARNING
DISABILITIES**

by

Jessica A. Consiglio

A Thesis

Submitted to the
Department of Interdisciplinary and Inclusive Educaiton
College of Education

In partial fulfillment of the requirement

For the degree of
Master of Arts in Special Education

at

Rowan University

May 5, 2018

Thesis Chair: Amy Accardo, Ed. D.

© 2018 Jessica A. Consiglio

Dedications

This thesis is dedicated to my students, past and present. Your passion and perseverance inspire me every day. You are the reason I love my job.

Acknowledgment

I would like to express my appreciation and gratitude to Dr. Amy Accardo for her guidance, dedication and encouragement during the research and writing processes.

Abstract

Jessica Consiglio

THE EFFECTIVENESS OF THE KEYWORD METHOD ON FOREIGN LANGUAGE VOCABULARY FOR STUDENTS WITH LEARNING DISABILITIES

2017-2018

Amy Accardo, Ed. D.

Master of Arts in Special Education

The purpose of this study was: (a) to examine the effectiveness of the keyword mnemonic method to improve the foreign language receptive vocabulary of students with learning disabilities, (b) to examine the effectiveness of the keyword mnemonic method to improve the productive foreign language vocabulary of students with learning disabilities and (c) to evaluate student satisfaction and perceptions of the keyword mnemonic method intervention. Three seventh and eighth grade students, one male and two females, with a learning disability participated in the study. A single subject ABAB design was used. During the baseline phases students received instruction using rote memorization. During the intervention phases students received instruction using the keyword mnemonic method. Daily assessments were scored throughout all phases. Results show that students improved their receptive foreign language and productive foreign language vocabulary during the intervention phases. The student satisfaction survey suggests students enjoyed using the keyword mnemonic method. Further research over an extended period of time is suggested to assess long term foreign language acquisition.

Table of Contents

| | |
|---|------|
| Abstract | v |
| List of Figures | viii |
| List of Tables | ix |
| Chapter 1: Introduction | 1 |
| Statement of Problem | 2 |
| Significance of the Study | 3 |
| Purpose of the Study | 4 |
| Research Questions | 4 |
| Key Word | 4 |
| Chapter 2: Review of the Literature | 5 |
| Dual Coding Theory | 6 |
| Usage of the Keyword Method With Native Language Instruction | 7 |
| Usage of the Keyword Method With Foreign Language Instruction | 9 |
| Receptive Language | 10 |
| Productive Language | 13 |
| Conclusion | 14 |
| Chapter 3: Methodology | 15 |
| Setting | 15 |
| School | 15 |
| Classroom | 15 |
| Participants | 15 |
| Participant 1 | 16 |

Table of Contents (Continued)

| | |
|--|----|
| Participant 2 | 17 |
| Participant 3 | 17 |
| Research Design | 17 |
| Materials | 18 |
| Measurable Materials..... | 19 |
| Daily Assessments | 19 |
| Procedures | 19 |
| Measurable Procedures | 19 |
| Daily Assessments | 19 |
| Survey | 20 |
| Data Analysis | 21 |
| Chapter 4: Results | 23 |
| Receptive Vocabulary | 23 |
| Productive Vocabulary | 27 |
| Survey Results | 31 |
| Chapter 5: Discussion | 34 |
| Findings | 34 |
| Limitations | 36 |
| Implications and Recommendations | 37 |
| Conclusions | 38 |
| References | 39 |

List of Figures

| Figure | Page |
|--|------|
| Figure 1. Student satisfaction survey | 21 |
| Figure 2. Receptive vocabulary scores Student A | 25 |
| Figure 3. Receptive vocabulary scores Student B | 26 |
| Figure 4. Receptive vocabulary scores Student C | 27 |
| Figure 5. Productive vocabulary scores Student A | 29 |
| Figure 6. Productive vocabulary scores Student B | 30 |
| Figure 7. Productive vocabulary scores Student C | 31 |

List of Tables

| Table | Page |
|---|------|
| Table 1. General Information of Participating Students | 16 |
| Table 2. Mean and Standard Deviation of Receptive Vocabulary across Phases | 24 |
| Table 3. Mean and Standard Deviation of Productive Vocabulary across Phases | 28 |
| Table 4. Student Satisfaction Survey Percentage Results | 32 |

Chapter 1

Introduction

Currently students with learning disabilities must meet rigorous standards and endure high-stakes testing. Students with learning disabilities are educated and evaluated on the general education curriculum. It is important that the most effective practices are used to enable special education students to be successful both in school and after graduation (Kuder, 2017). Success in school relies heavily on a student's ability to recall content specific information on content assessments (Wolgemuth, Cobb, & Alwell, 2008). A primary component of language learning is vocabulary acquisition (Amiryousefi & Ketabi, 2011). Accurately identifying the words in a text leads to reading comprehension and overall academic success (Roberts, et al., 2008). Research suggests mnemonic methods have been effective, particularly for students with learning disabilities acquiring new vocabulary (Wolgemuth, Cobb & Alwell, 2008). Mnemonic strategies use a rhyme and picture to help students recall information (Kuder, 2017).

The Keyword Method (KWM) is a mnemonic strategy that can be used when teaching abstract and concrete vocabulary (Shapiro & Waters, 2005). The method uses three steps, recoding, relating and retrieving to make the new vocabulary more meaningful (Foil & Alber, 2002). During the recoding phase a keyword is created that is acoustically similar to the new vocabulary word (Shapiro & Waters, 2005). In the relating phase, a visual is produced connecting the interaction between the keyword and the meaning of the vocabulary word. During the last phase, the *retrieving* phase, the student uses the prior strategies to recall the definition of the vocabulary word (Foil & Alber, 2002).

Statement of Problem

Vocabulary development is closely related to comprehension and can be a strong factor to determining reading success (Biemiller, 2003; Berne & Blachowicz, 2008; Joshi, 2005). The effects of low vocabulary typically become apparent in the third grade when reading material begins to surpass student's vocabulary (Biemiller, 2003). Sadly, some students will never catch up and/or may continue to fall behind in reading (Biemiller, 2003). In addition, older students with learning disabilities do not read as much independently and in turn, are less exposed to new vocabulary. High school students with learning disabilities may struggle to read in all content areas and continue to fall further behind than their peers (Roberts, et al., 2008).

In 2008, Berne and Blachowicz conducted a survey with seventy-two classroom teachers, reading specialists and literacy coaches regarding vocabulary instruction in the classroom. The professionals reported that they did not feel confident in their vocabulary instruction and wanted to learn best practices to implement within the classrooms and at the district level. One problem identified with vocabulary instruction is that the students easily forget the newly learned vocabulary words (Amiryousefi & Ketabi, 2011). Many methods of instruction have been used to teach vocabulary such as drills with flash cards, direct instruction and the dictionary (Mastropieri et. al, 1985; Joshi, 2005). More meaning-based approaches provide better student understanding of the vocabulary (Joshi, 2005).

Memory also plays a major role in vocabulary recall and comprehension. The goal of vocabulary instruction is to reassign the learned vocabulary from your short term

memory into your long term memory. Strategies like mnemonics help aid the transition by linking new information with information the students already know. Once the information is presented in a meaningful way, e.g. through visual or verbal cues, the information is stored in the long term memory (Amiryousefi & Ketabi, 2011). Students with memory difficulties have been found to struggle when learning a foreign language (Sparks & Ganschow, 1993). For such students, the KWM may be effective “because it takes advantage of the strength of visual memory” (Shapiro & Waters, 2005, p.131). In addition, the KWM requires active learning and engagement between the new vocabulary word, the keyword and the visual (Shapiro & Waters, 2005). The KWM should be used during the early levels of foreign language learning, as it allows students to learn a large amount of vocabulary and build confidence in the foreign language (Kasper, 1993).

Significance of the Study

According to the high school graduation requirements set by the state of New Jersey, all students must earn at least five credits in foreign language to graduate. Many districts in New Jersey require more than the minimum as part of local graduation requirements. This applies to all students including general education students and students with learning disabilities (New Jersey Department of Education, 2008).

Positive data is found on the usage of the KWM in the foreign language classroom, however, it is not regularly being used in the classroom. Some concerns lie with the amount of time used to implement this method and the training of foreign language teachers to use the method. Another concern is the dependency on the usage of the English language to form the keyword. This contradicts the foreign language teaching approach which is to keep language instruction in the foreign language (Kasper, 1993).

This study is significant as it will investigate the impact of the KWM in the modified resource foreign language classroom for students with learning disabilities. Although there is research with the KWM and the foreign language classroom, much of the research applies to general education population (e.g. Fritz, Morris, Acton, Voelkel, & Etkind, 2006; Campos, Amor, & González, 2004).

Purpose of the Study

The purpose of this study is to evaluate the effectiveness of the keyword mnemonic method in the foreign language classroom. This study investigates: (a) the impact of the mnemonic keyword method on the receptive vocabulary of students with learning disabilities, (b) the impact of the mnemonic keyword method on the productive vocabulary of students with learning disabilities, and (c) the level of satisfaction that students with learning disabilities have with the mnemonic keyword method.

Research Questions

1. Will use of the keyword mnemonic method impact the receptive foreign language vocabulary of middle school students with learning disabilities?
2. Will use of the keyword mnemonic method impact the productive foreign language vocabulary of middle school students with learning disabilities?
3. Are students with learning disabilities satisfied with the keyword mnemonic method to learn foreign language vocabulary?

Key Word

For the purposes of this study, the *keyword mnemonic method* can be defined as an instructional method of teaching vocabulary that uses an acoustically similar sounding word and visual to recall the new vocabulary word.

Chapter 2

Review of the Literature

Today's society places an emphasis on global understanding. Learning a foreign language gives students insight into a culture and language different from their own (DiFino & Lombardino, 2004). Foreign language acquisition is an important goal for students today. Many public schools and colleges mandate foreign language courses as a requirement (Ganschow, Sparks & Javorky, 1998). The state of New Jersey requires a minimum of five foreign language credits as a high school graduation requirement (New Jersey Department of Education, 2008).

Students with learning disabilities may experience difficulties when learning a foreign language in the areas of phonology, morphology, syntax, executive functioning and working memory. Moreover, students with learning disabilities may have difficulty retrieving vocabulary, grammar and pronunciation rules simultaneously, all of which are needed for linguistic accuracy (Leons, Herbert, & Gobbo, 2009).

The need for vocabulary intervention is crucial as learning vocabulary is a key element in school, especially in the foreign language classroom (Clark & Paivio, 1991). The keyword mnemonic method has been found effective for improving vocabulary for students with learning disabilities within their native language vocabulary (Conduis, Marshall, & Miller, 1986; Mastropieri, Scruggs, & Faulk, 1990; Mastropieri, Scruggs, Levin, Gaffney, & McLoone, 1985) and foreign language vocabulary (Fritz, Morris, Acton, Voelkel, & Etkind, 2007). Some researchers suggest the effectiveness of the keyword mnemonic method lies within the use of multiple modalities such as visual and acoustical connections to the new vocabulary word (Paivio, 1991; Sagarra & Alba, 2006).

This chapter provides a review of the literature of the keyword mnemonic method used in both the foreign language classroom and with native language instruction. In addition, this chapter will provide implications for students with learning disabilities in the foreign language classroom.

Dual Coding Theory

The Dual Coding Theory (DCT) was first introduced by Allan Paivio in 1971 (Paivio, 1991). This theory suggests the use of multiple modalities, such as images and verbal connections, aid in memory cognition (Paivio, 1991). The addition of an imagery code is more likely to be remembered than the verbal code alone (Paivio, 1991). Research suggests the addition of images generates better recall than rote practice such as translating vocabulary from one language to another (Paivio & Lambert, 1981).

The findings of a study conducted by Sagarra and Alba (2006) align with Paivio's DCT. Sagarra and Alba investigated the effectiveness of three different learning methods of second language vocabulary acquisition: rote memorization, the keyword method and semantic mapping. Nine hundred sixteen college students in their third semester of Spanish were exposed to 24 Spanish vocabulary words using the three methods of learning. The order of the learning methods was changed among the three different experimental groups to ensure the efficacy of the study. The researchers did not want external factors such as motivation, learning styles, memory and/or mental fatigue to effect the findings. Two posttests were given to assess the effectiveness of the different learning methods, one immediately after instruction and the other after an additional three weeks. The results of both assessments provide evidence that the keyword method is a more effective method of learning second language vocabulary than rote memorization

and semantic mapping (Sagarra & Alba, 2006). The findings of Sagarra and Alba (2006) align with Paivio's DCT and suggest techniques like the keyword method require deeper processing, ultimately resulting in better memory retention for students. The implications for instruction in the foreign language classroom are to use the keyword method at the early stages of vocabulary acquisition. Further research must be conducted to measure the long-term effects of the keyword method for vocabulary acquisition (Sagarra & Alba, 2006).

Usage of the Keyword Method with Native Language Instruction

An array of studies on vocabulary acquisition have been published with learning disabled students at the elementary and high school levels. Consistent findings among the studies suggest the keyword method of instruction is a more effective strategy for acquiring vocabulary (Condue, Marshall, & Miller, 1986; Mastropieri, Scruggs, & Faulk, 1990; Mastropieri, Scruggs, Levin, Gaffney, & McLoone, 1985).

In 1985, Mastropieri, et al. conducted two studies with 32 junior-high school students with learning disabilities assessing the effectiveness of the keyword method over direct instruction with the acquisition of low frequency vocabulary or uncommonly used vocabulary. In the first study, the students were given the mnemonic visual and in the second study, the students were instructed to generate their own mnemonic visual. Students in the direct instruction condition were taught through questioning, practice and review. Results from both studies provide evidence that the keyword method is more effective than direct instruction, whether the students were given the image or the students created the images themselves. The researchers also state that good mnemonic

instruction does contain elements of direct instruction, which should not be ignored (Mastropieri et al., 1985).

In a similar study conducted in 1990 by Mastropieri, Scruggs and Faulk, 25 students with learning disabilities in sixth, seventh and eighth grade were assessed on their recall and comprehension of vocabulary using the keyword method or direct instruction. The students were taught difficult vocabulary, eight concrete and eight abstract vocabulary words. The results of the study indicated the students in the keyword method group performed better with recall and comprehension for both abstract and concrete vocabulary. This is also evidence that students with learning disabilities learn significantly more concrete vocabulary using the keyword method over direct instruction. (Mastropieri et al., 1990).

In a comparable study conducted by Condos, Marshall and Miller (1986), 64 twelve-year-old students with learning disabilities were assessed on the acquisition and maintenance of vocabulary. The students with learning disabilities were split into two groups; 32 students were able to process high receptive vocabulary and 32 students were able to process low receptive vocabulary. All 64 students were distributed equally and randomized into one of four experimental groups: keyword image, picture context, sentence experience context or control. Students in the control group were given their option on their study method. The other groups were taught vocabulary according to their experimental group. The posttests were given three times during the study including immediately after the vocabulary was learned, after two weeks and after eight weeks of instruction. Students in the keyword image group outperformed all other groups. Students with high receptive vocabulary outperformed the students with low receptive vocabulary,

however, students with low receptive vocabulary in the keyword image group outperformed other students in all other groups. The study suggests that the complex method, such as the keyword method, is effective for students with learning disabilities when acquiring vocabulary immediately and after eight weeks of instruction. (Condue et al., 1986).

Usage of the Keyword Method with Foreign Language Instruction

The keyword method has been used in various studies to acquire vocabulary in a foreign language (Campos, Amor, & González, 2004; Fritz, Morris, Acton, Voelkel, & Etkind, 2007). Kasper (1993) suggests the keyword method should be used during early stages of foreign language learning, as it helps students build confidence when acquiring new vocabulary. The confidence the students gain may increase motivation to learn and, in turn, aid in the development of automaticity in the production and comprehension of the new vocabulary (Kasper, 1993).

A key factor of success with the keyword method is the image quality of the keyword (Beaton et al., 2005). Campos, Amor and González (2004) agree with Paivio's DCT and suggest visual mnemonics are more effective with high-vividness words than with low-vividness words, or words difficult to form images. In addition, Campos et al. (2004) believe when the subject creates the keyword and image the keyword method becomes more effective because it is using the subject's mode of coding.

Campos et al. (2004) conducted two studies measuring the effectiveness of the keyword method with high-vividness words and low-vividness words. In the first study 363 native Spanish-speaking students with ages ranging from 12 to 15 were split into four different learning groups: a control group which learned the new vocabulary using the

rote method, and three other keyword method groups. The keyword method groups all used images and keywords to associate the new vocabulary but the generation of the keyword and image was different. The researchers created the keywords and images for one group, in another group the students themselves generated the keywords and images, and in the last group the keywords and images were created by the students' peers. The students were assessed on their ability to recall the new Latin vocabulary by producing their native language equivalent immediately after instruction and also one week later. The students learned 30 new vocabulary words but were only assessed on 13 words, seven which were considered high vividness and six which were considered low vividness. Overall, the results indicated all three keyword groups were able to recall significantly more words than the control group (Campos et al., 2004). The groups were able to recall the most groups were the peer generated group, the experimenter generated group and then the subject generated group, respectively. Recall was significantly higher for high-vividness words than for low-vividness words across all study groups (Campos et al., 2004).

Receptive language. Fritz, Morris, Acton, Voelkel and Etkind (2007) conducted two separate studies assessing the effectiveness of the keyword method in comparison with other techniques when learning foreign language vocabulary. The first study consisted of 45 participants between the ages of 19 and 35. The participants were evenly divided into three learning conditions: retrieval practice, keyword method and rote rehearsal. The participants were assessed twice on their receptive vocabulary by producing the English equivalent to the foreign language word. The test took place three minutes after learning the vocabulary and again three days after learning the vocabulary.

The rote rehearsal recall was poor. Both keyword method and retrieval practice groups outperformed the rote method group. Neither of these groups were significantly more effective than one another (Fritz et al., 2007).

The second study compared retrieval practice with the keyword method with a group of 30 students from Lancaster University ranging from ages 18 to 22. This study also consisted of a control group condition. This study assessed student receptive vocabulary of German vocabulary words following one day of instruction. Once again, the keyword and retrieval practice condition surpassed the control group (Fritz et al., 2007). These studies suggest the keyword method group and retrieval practice group are both effective when assessing receptive language (Fritz et al., 2007).

A set of two investigations conducted by Campos, González and Amor (2003) focused on the effectiveness of the mnemonic keyword method with adolescents. The first study compared the effectiveness of the mnemonic keyword method with a rote method of learning. A total of 174 Spanish-speaking students from ages 12 to 16 were randomly assigned to either the keyword group of the control group or to the rote method group. The Latin vocabulary used for this investigation was concrete and also had a high image value. The participants in the keyword group were given a booklet that contained the 30 vocabulary words and a keyword, however, the participants were instructed to visualize their own image. The control group was given the same booklet of vocabulary and they were instructed to study in a way that worked best for them. Both groups were given 15 minutes to study the vocabulary words. The participants were assessed on their recall of the first language (L1) vocabulary from the second language (L2) vocabulary one minute after instruction and again one week later. The findings indicated the rote

group performed better than the keyword group both immediately and one week after instruction. The difference was more significant when the participants were assessed immediately than one week later. The implications of this study suggest when adolescent students are allowed to pace themselves, the keyword method is no more effective than other methods of instruction (Campos et al., 2003).

In the second study, the researchers, again, measured the effectiveness with the keyword method with adolescents. The difference between this study and the previous study is the participants were given the visual image and keyword to the L1 vocabulary instead of generating images on their own. A total of 153 Spanish-speaking students were randomly split into two groups: the control group and the keyword group. The participants in the control group were given a booklet of the 30 vocabulary words and instructed to use whichever method of learning they wanted for a total of 15 minutes. The participants in the keyword group were also given 15 minutes to study the vocabulary in the same booklet with the addition of the visual image and keyword. All participants were assessed on their recall of the L1 vocabulary from the L2 vocabulary one minute after instruction and again one week later. Once again, the findings indicated the control group performed better than the keyword group both immediately and one week after instruction (Campos et al., 2003). Contrary to the findings of Fritz et al. (2007) and Campos, Amor and González (2004), Campos et al. (2003) found that the rote method was more effective than the keyword method when used with adolescents. The researchers also suggest that there is a gap in this type of research and more research is needed in a more natural, classroom-like setting among children of different age groups (Campos, et al. 2003).

Productive language. In another study conducted by Fritz et al. (2007) the researchers again compared the retrieval practice and keyword method with not only receptive language, but also with productive language. The researchers wanted to study productive language because it is typically more difficult to learn than receptive language (Fritz et al., 2007). Beaton, Gruneberg, Hyde, Shufflebottom and Sykes suggest that productive language is more difficult to produce because “subjects are required to produce unfamiliar orthographic and phonological patterns when learning new foreign language words” (Beaton, et al., 2005, p. 458-495). When assessing productive language in the study conducted by Fritz et al. (2007), the participants were given the English vocabulary word and asked to recall or produce the word in the foreign language. In addition to the two teaching techniques, two additional groups were included, an elaboration group and a combined group using both retrieval practice and the keyword method.

The study included 56 eighth grade participants from two British schools. None of the students were classified as learning disabled. The students were assessed immediately after instruction and again one week later. When the students’ receptive language was assessed both immediately after instruction and one week after instruction, the students in the retrieval practice group and combined method group performed better than the keyword method group (Fritz et al., 2007). All three groups outperformed the elaboration group. When the students’ productive language was assessed immediately after instruction, the combined group and retrieval practice group performed better than the keyword method group. When the students’ productive language was assessed one week after instruction, again, the retrieval practice group and the combined group

performed better than the keyword method group, however, there was no significant difference (Fritz, et al., 2007). The implications of this study suggests the retrieval method is just as strong, and at times superior to the keyword method when productive language is assessed.

Conclusion

Research suggests students with learning disabilities perform more poorly on language assessments than their non-learning disabled peers (Ganschow & Sparks, 2000). Poor memorization is one factor of poor performance of language with exceptional students. Memorization is a crucial skill needed when learning a second language. In order to aid students with learning disabilities in learning a second language, vocabulary should be taught through the use of more than one modality (DiFinio & Lombardino, 2004). The keyword method uses multiple modalities and may increase the association and recall between the foreign vocabulary and the native vocabulary (Kasper, 1993).

The purpose of this study is to evaluate the effectiveness of the keyword mnemonic method in the foreign language classroom. This study investigates: (a) the impact of the mnemonic keyword method on the receptive vocabulary of students with learning disabilities, (b) the impact of the mnemonic keyword method on the productive vocabulary of students with learning disabilities, and (c) the level of satisfaction that students with learning disabilities have with the mnemonic keyword method.

Chapter 3

Methodology

Setting

School. The study was conducted in a public middle school in a central New Jersey school district. The school district consists of one middle school servicing students from one town. Each grade is divided into four academic teams. The school operates on a seven period schedule lasting 56 minutes each.

The middle school consists of approximately 1600 students in grades sixth through eighth. Approximately 15% of these students have IEPs and receive special education services. The middle school has a diverse student population. According to the New Jersey Performance Report (New Jersey Department of Education, 2016), 57.5% of the students are Caucasian, 33.8% are Asian, 4.2% are Black, 3.7% are Hispanic and less than 1% are other races.

Classroom. The classroom where the study took place is used by a general education science teacher, a general education physical education teacher, a general education Spanish teacher and a special education teacher. The classroom consists of two teacher desks and six student tables. There is an ELMO that syncs from the desktop computer with the projector. In addition, the teacher's laptop is able to sync to the EPSON projector. The classroom has a computer that is designated for both teacher and student use.

Participants

This study included three seventh and eighth grade middle school students, two females and two males. All students in this study were classified with a learning

disability. They were found eligible for a wide variety of classifications including: other health impaired (OHI) due to an attention deficit hyperactivity disorder (ADHD) diagnosis, specific learning disability (SLD) with a sub-classification of mathematical calculations (MC) and SLD with a sub-classification of basic reading skills (BRS) and autistic. All participants in this study have an IEP to meet their individualized needs. Table 1 presents the general participation information.

Table 1
General Information of Participating Students

| Student | Age | Grade | Classification |
|---------|-----|-------|------------------|
| A | 13 | 8 | OHI ADHD |
| B | 13 | 7 | SLD BRS |
| C | 14 | 8 | SLD MC MPS |

Participant 1. Student A is a 13-year old Caucasian female. She is eligible for special education services under the classification OHI due to her diagnosis of ADHD. She also has both developmental math and reading disorders. She wears glasses and has had two eye surgeries for “lazy eye” and Strabismus. She needs assistance with organization, prompting, redirection and frequent modeling. She benefits from the small group setting and is currently in the modified resource classroom for all of her core

classes, including world cultures. She completes all of her assignments and always works her hard. She attended a vocational school for half of the school day for the first and second marking periods of the school year.

Participant 2. Student B is a 13-year old Indian female. She is eligible for special education services under the classification SLD in the area of basic reading skills. She consistently comes to class prepared and is eager to learn. She attends a decoding class prior to the start of the school day and also participates in the district's extended school year program during the summer months. She benefits from the small group setting and is currently placed in the modified resource classroom for all her core classes, including world cultures.

Participant 3. Student C is a 14-year old Caucasian male. He is eligible for special education services under the classification SLD in the area of mathematical calculations and mathematical problem solving. He enjoys coming to class and often participates in classroom discussions. He lives in a bilingual home, as his parents speak both Spanish and English. He benefits from the small group setting and is currently placed in the modified resource classroom for all of his core classes, including world cultures. He attended a vocational school for half of the school day for the first and second marking periods of the school year.

Research Design

A single subject design with ABAB phases was used for this study. This study explored the effectiveness of the independent variable, the keyword method, on the dependent variables of receptive foreign language vocabulary and productive foreign language vocabulary. Receptive foreign language vocabulary and productive foreign

language vocabulary achievement on daily assessments were measured throughout the study. During Phase A, baseline data was collected for five sessions over one week by the researcher. Instruction during this phase modeled a traditional classroom. Class time was utilized for instruction of foreign language vocabulary and practice. Each day, at the end of the class period, students were given two exit tickets assessing their mastery of their receptive and productive foreign language vocabulary.

During Phase B, the keyword method was introduced. The students received instruction on the new foreign language vocabulary by the use of the keyword method. Data was collected for five days, over one week. Students were given two exit tickets at the end of each class assessing the mastery of the receptive and productive foreign language vocabulary.

During the second Phase A, students returned to a traditional classroom model. This phase included five sessions over one week. During the second Phase B, students returned to the keyword method and data was collected for five additional days over one week.

Materials

During phase A, materials used included vocabulary worksheets, pictures of vocabulary words, note cards, scissors and daily assessments. During phase B materials included vocabulary worksheets, pictures of keyword, note cards, scissors and daily assessments.

Measurable Materials

Daily assessments. Each day during the study the students were given ten minutes to complete two exit tickets. During phase A, the assessments measured the receptive and productive vocabulary of the foreign language vocabulary using typical classroom instruction. During phase B, the assessments measured the receptive and productive vocabulary of the foreign language vocabulary using the keyword method.

Procedures

This study took place over four weeks. Week 1 baseline data was collected on participants' receptive and productive vocabulary on daily assessments. Week 2 was an intervention week. The students learned foreign language vocabulary through the keyword method and were assessed daily on their mastery of the receptive and productive vocabulary. Week 3 returned to baseline conditions. Week 4 returned to intervention conditions. At the end of week 4, participants were asked to complete a voluntary, anonymous student satisfaction survey regarding the keyword method intervention.

Measurable Procedures

Daily assessments. Throughout the study, two exit tickets were given at the end of each class period. One exit ticket measured the students' receptive vocabulary and the other exit ticket measured the students' productive vocabulary. Both exit tickets were graded and given a score of 0-10: 0 indicated the assessment was completely incorrect, 1 indicated one answer was correct, 2 indicated two answers were correct, 3 indicated three answers were correct, 4 indicated four answers were correct, 5 indicated five answers were correct, 6 indicated six answers were correct, 7 indicated seven answers were

correct, 8 indicated eight answers were correct, 9 indicated nine answers were correct and 10 indicated that all ten responses were correct.

Survey. At the conclusion of the study, participants were asked to complete a student satisfaction survey using a Likert Scale. The participants answered five questions regarding their satisfaction of the keyword method. The researcher read each question aloud and paused to give participants the opportunity to circle the picture that best represented their perception of the keyword method intervention. Participants answered each question with pictures representing a rating of 1-3: 1 indicated disagree, 2 indicated neutral and 3 indicated agree. The questions inquired whether the student was able to use the keyword method to learn and remember the new vocabulary, whether it was easy to remember the visual image, whether they enjoyed using the keyword method and whether they would like to use the strategy again. The participants were instructed not to put their names on the surveys to remain anonymous. Figure 1 shows the survey participants were asked to complete.

| Question | Disagree | Neutral | Agree |
|---|---|--|---|
| The <i>keyword method</i> strategy helped me to learn the meaning of new vocabulary words. |  |  |  |
| The <i>keyword method</i> strategy helped me to remember the meaning of new vocabulary words. |  |  |  |
| It was easy to remember the visual image. |  |  |  |
| I enjoyed using the <i>keyword method</i> strategy. |  |  |  |
| I want to use the <i>keyword method</i> strategy again to learn new vocabulary. |  |  |  |

Figure 1. Student satisfaction survey

Data Analysis

Survey results were gathered and reported in a table. The exit tickets were also scored and reported in a table. The data from the two variables were represented through a line graph. In addition, the data was compared and contrasted for each phase. The mean for receptive foreign language vocabulary and productive language vocabulary are

reported in tables. A comparison of results between the phases helped to determine the effectiveness of the keyword method in a foreign language classroom.

Chapter 4

Results

This single-subject design study utilized ABAB phases to examine the effectiveness of the keyword mnemonic method on receptive and productive foreign language vocabulary for students with learning disabilities in the world language classroom. Three seventh and eighth grade students receiving Spanish instruction in a modified resource classroom participated in this study. Research questions investigated the following:

1. Will use of the keyword mnemonic method impact the receptive foreign language vocabulary of middle school students with learning disabilities?
2. Will use of the keyword mnemonic method impact the productive foreign language vocabulary of middle school students with learning disabilities?
3. Are students with learning disabilities satisfied with the keyword mnemonic method to learn foreign language vocabulary?

Data was collected throughout all of the phases. Both receptive and productive vocabulary data were collected daily through exit passes. At the conclusion of the study, the students participated in an anonymous Likert scale survey regarding their satisfaction with the keyword mnemonic method.

Receptive Vocabulary

Receptive vocabulary scores were acquired through daily exit tickets. These assessments were graded on a ten-point scale with students earning points for

identification and spelling of the vocabulary word. Means and standard deviations of student scores on daily assessments are shown in Table 2.

Table 2

Mean and Standard Deviation of Receptive Vocabulary across Phases

| | Baseline 1 | | Intervention 1 | | Baseline 2 | | Intervention 2 | |
|-----------|------------|-----|----------------|-----|------------|-----|----------------|-----|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Student A | 7.8 | 1.3 | 9.0 | 1.2 | 7.8 | 1.3 | 10 | 0.0 |
| Student B | 6.0 | 1.2 | 8.8 | 1.1 | 7.2 | 1.1 | 8 | 2.0 |
| Student C | 5.8 | 0.4 | 9.6 | 0.5 | 7.4 | 0.5 | 8.2 | 1.1 |

Student A is a 13-year old Caucasian female. She is eligible for special education services under the classification OHI due to her diagnosis of ADHD. During the first baseline phase, Student A’s mean score on her receptive vocabulary was 7.8. Student A’s mean score increased during the first intervention phase to 9.0. When the intervention was removed, during the second baseline phase, the student’s score decreased to 7.8. The student’s mean score again increased during the second intervention phase to 10. Student A’s receptive vocabulary data is shown in Figure 2. The figure shows the student’s scores decreased during baseline. When the keyword mnemonic method was introduced during both phases the student’s scores increased. During the second intervention phase Student A’s scores remained consistently high.

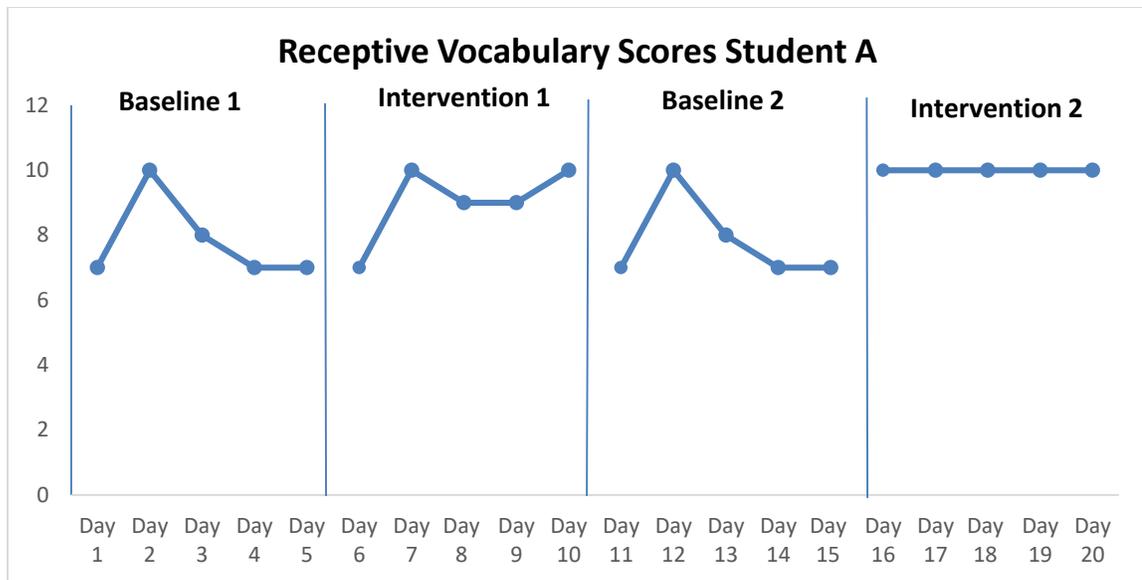


Figure 2. Receptive vocabulary scores Student A

Student B is a 13-year old Indian female. She is eligible for special education services under the classification SLD in the area of basic reading skills. During the first baseline phase, Student B’s mean score on her receptive vocabulary was 6. Student B’s mean score increased to 8.8 during the first intervention phase. When the intervention was removed, during the second baseline phase, the student’s mean score decreased to 7.2. The student’s mean score again increased to 8 during the second intervention phase. Student B’s receptive vocabulary data is shown in Figure 3. The figure displays during the baseline phases the student’s scores decreased throughout the phases. When the keyword mnemonic method was introduced during both phases the student’s scores increased. Student B’s daily scores fluctuated throughout the second baseline phase and both intervention phases.

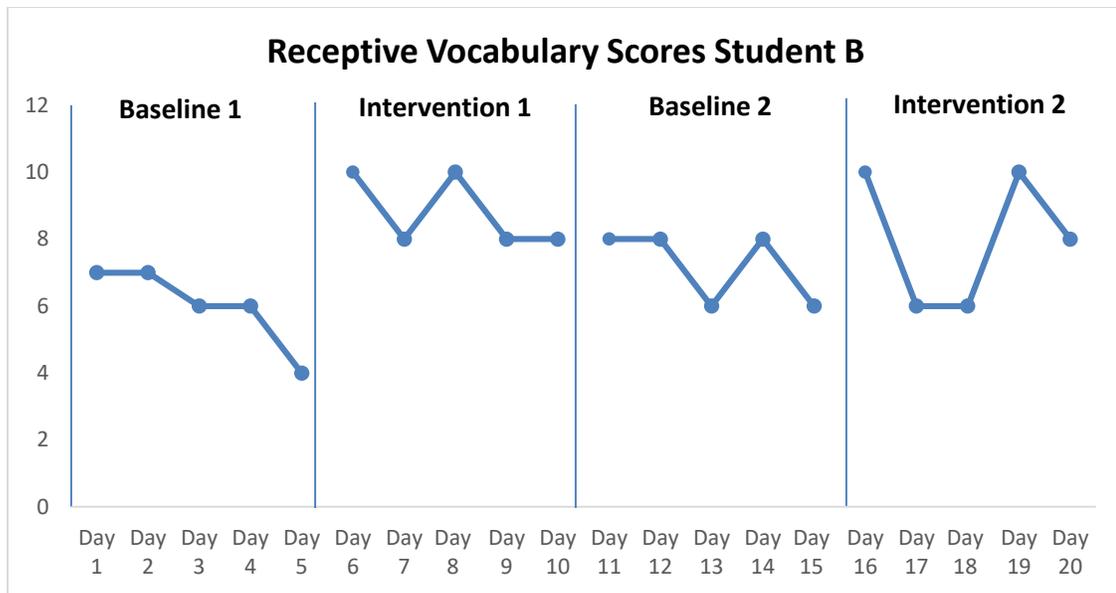


Figure 3. Receptive vocabulary scores Student B

Student C is a 14-year old Caucasian male. He is eligible for special education services under the classification SLD in the area of mathematical calculations and mathematical problem solving. During the first baseline phase, Student C’s mean score on his receptive vocabulary was 5.8. Student B’s mean score increased to 9.6 during the first intervention phase. When the intervention was removed, during the second baseline phase, the students’ mean score decreased to 7.4. The student’s mean score again increased to 8.2 during the second intervention phase. Student C’s receptive vocabulary data is shown in Figure 4. The figure shows during the first and second baseline phases the student scores were consistent. When the keyword mnemonic method was introduced during both phases the students’ scores increased.

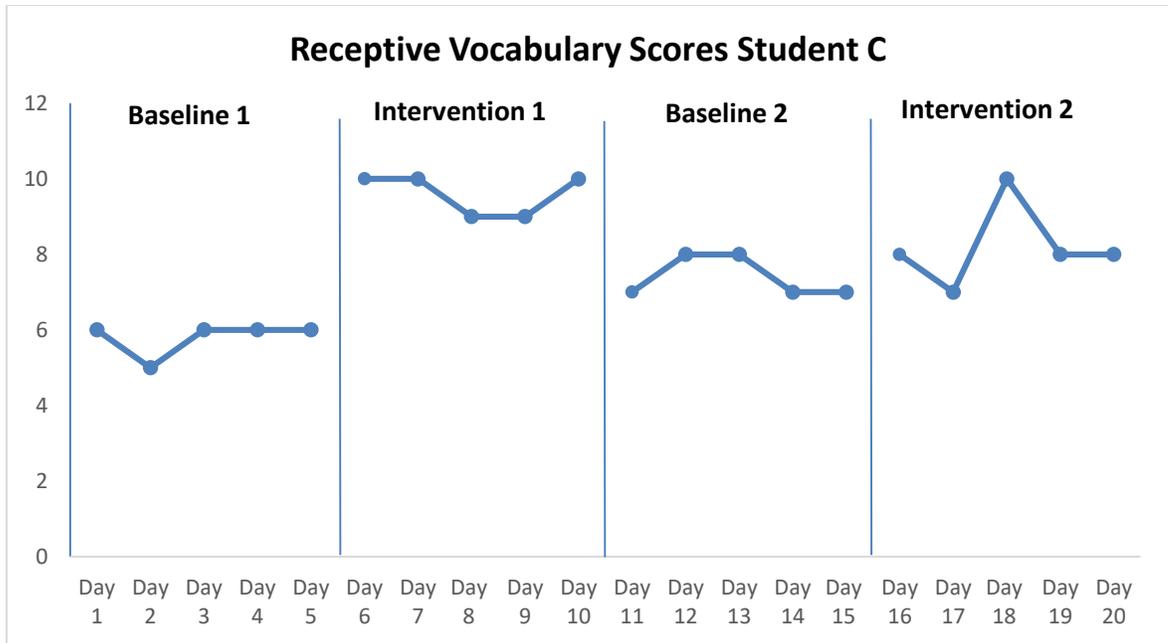


Figure 4. Receptive vocabulary scores Student C

Productive Vocabulary

Productive vocabulary scores were acquired through daily exit tickets. These assessments were graded on a ten-point scale with students earning points for identification and spelling of the vocabulary word. Means and standard deviations of student scores on daily assessments are shown in Table 3.

Table 3

Mean and Standard Deviation of Productive Vocabulary across Phases

| | Baseline 1 | | Intervention 1 | | Baseline 2 | | Intervention 2 | |
|-----------|------------|-----|----------------|-----|------------|-----|----------------|-----|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Student A | 7.0 | 1.2 | 10 | 0.0 | 7.8 | 1.3 | 10 | 0.0 |
| Student B | 6.6 | 0.6 | 10 | 0.0 | 7.0 | 2.0 | 7.4 | 2.4 |
| Student C | 5.4 | 1.3 | 10 | 0.0 | 7.0 | 0.8 | 8.6 | 1.3 |

During the first baseline phase, Student A's mean score on her daily assessments was 7. Student A's mean score increased during the first intervention phase to 10. When the intervention was removed, during the second baseline phase, the students' mean score decreased to 7.8. When the intervention was again added Student A's mean score was 10. Student A's productive vocabulary data is shown in Figure 5. The figure shows during the first baseline phase the student's scores fluctuated. During the second baseline phase Student A's scores began low, sharply increased and steadily declined. During the both intervention phases the student received perfect scores on all assessments.

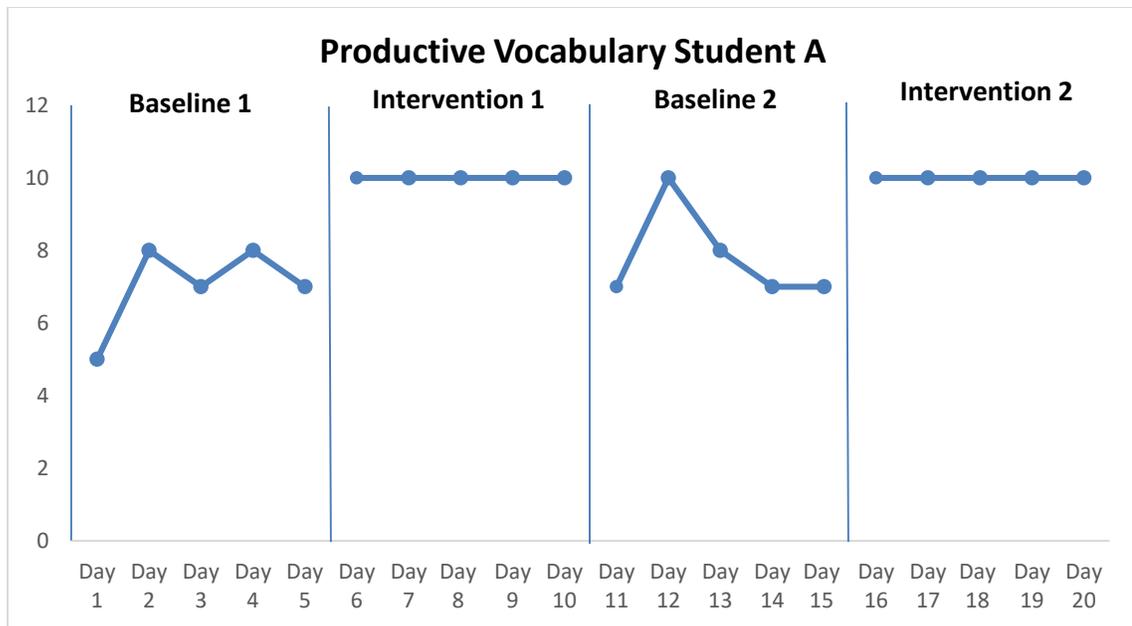


Figure 5. Productive vocabulary scores Student A

During the first baseline phase, Student B's mean score on her receptive vocabulary was 6.6. Student B's mean score increased during the first intervention phase to a 10. When the intervention was removed, during the second baseline phase, the student's mean score decreased to 7. When the intervention was added again Student B's mean score increased to 7.4. Student B's productive vocabulary data is shown in Figure 6. The figure shows during the first baseline phase the student's scores remained consistent. During the first intervention phase the student received a 10 on all assessments. Student B's scores began high and were inconsistent for the remaining baseline and intervention phases.

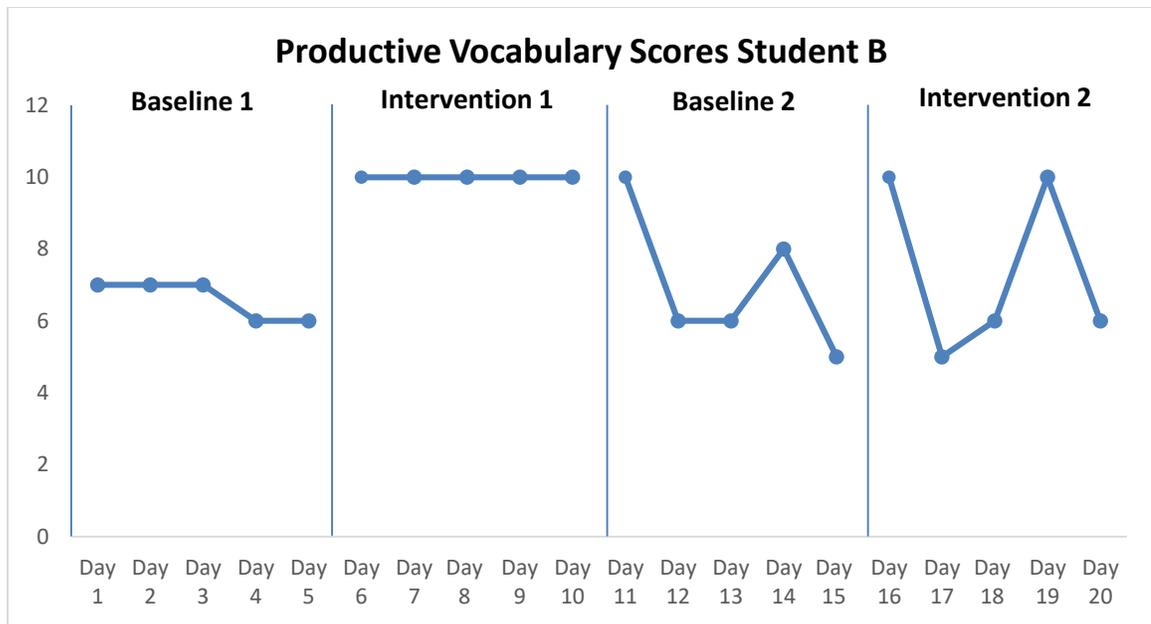


Figure 6. Productive vocabulary scores Student B

During the first baseline phase, Student C’s mean score on his receptive vocabulary was 5.4. Student C’s mean score increased during the first intervention phase to a 10. When the intervention was removed, during the second baseline phase, the student’s mean score decreased to 7. When the intervention was added again Student C’s mean score increased to 8.6. Student C’s productive vocabulary data is shown in Figure 7. The figure displays during the first baseline phase the student’s scores fluctuated. During the first intervention phase the student scored a 10 on all assessments. Student C’s scores during the second baseline initially decreased and then slowly increased. During the second intervention phase Student C’s scores stayed consistent with the last phase and steadily increased.

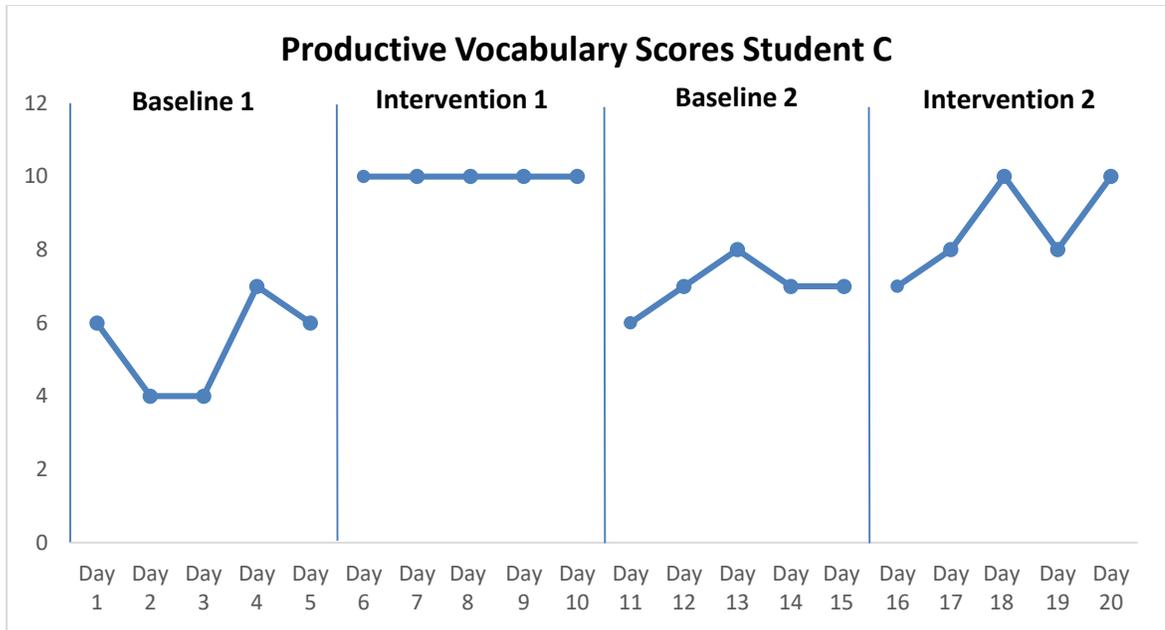


Figure 7. Productive vocabulary scores Student C

Survey Results

All students voluntarily completed a Likert scale satisfaction survey after the completion of the second intervention phase. The results were scored and converted into percentages. The student response percentages for each category in the five survey statements are displayed in Table 4.

Table 4

Student Satisfaction Survey Percentage Results

| Statement | 1 Disagree (%) | 2 Neutral (%) | 3 Agree (%) |
|--|-------------------------------|------------------------------|----------------------------|
| The keyword method strategy helped me to learn the meaning of new vocabulary words. | 0 | 0 | 100 |
| The keyword method strategy helped me to remember the meaning of new vocabulary words. | 33 | 0 | 67 |
| It was easy to remember the visual image. | 0 | 100 | 0 |
| I enjoyed using the keyword method strategy. | 0 | 0 | 100 |
| I want to use the keyword method strategy again to learn new vocabulary. | 0 | 33 | 67 |

As seen in Table 4, a rating of 1 indicated the students disagreed with the statement. A rating of 2 indicated the students neither agreed or disagreed with the statement. A rating of 3 indicated the students agreed with the statement. Table 4 presents that all students agreed with the statements “the keyword method strategy helped me to learn the meaning of new vocabulary words,” “it was easy to remember the visual image” and “I enjoyed using the keyword method strategy”. Most of the students agreed that the keyword method strategy helped them to remember the meaning of new vocabulary words. Most of the students also agreed that they wanted to use keyword method strategy

again to learn new vocabulary. Overall, the students were satisfied with the keyword method.

Chapter 5

Discussion

The purpose of this study was to determine the effectiveness of the keyword mnemonic method as an intervention for improving receptive foreign language vocabulary and productive foreign language vocabulary in the foreign language classroom for students with learning disabilities. At the end of the study the participants were asked to complete a survey to assess their satisfaction and perceptions of the keyword method.

Findings

Research suggests that the use of the keyword mnemonic method is more effective than rote memorization or semantic mapping when learning a foreign language (Sagarra & Alba, 2006). These findings align with Pavio's Dual Coding Theory and suggest techniques like the keyword method require deeper processing, ultimately resulting in better memory retention for students (Sagarra & Alba, 2006). In the present study all three participants improved their mean scores for receptive foreign language vocabulary and productive foreign language vocabulary during the intervention phases.

True to the findings of Fritz, Morris, Acton, Voelkel and Etkind (2007), the keyword method intervention resulted in more success for students than rote memorization in the area of receptive foreign language vocabulary. The results of the present study for Student A, Student B and Student C support these findings. During the first baseline-intervention cycle, Student A's mean score increased from a 7.8 to a 9. One of Student A's incorrect responses during the intervention cycle stemmed from a spelling mistake, which changed the identification of the word. For example, Student A identified

“débil” as “week” instead of the correct answer, “weak”. Another mistake during the intervention phase stemmed from Student A working not using the word bank provided. For example, Student A identified “mujer” as “womal” instead of the correct answer, “woman” and “fin” as “finish” instead of the correct answer, “end”. Student A took for granted that she knew the English language and did not use the word bank. In the second cycle, similar results were found with a mean score increase from 7.8 to a 10. During this intervention cycle Student A worked more carefully and made sure to use the word bank provided to check her work. Student B and Student C also displayed improved receptive language vocabulary. During the first baseline-intervention cycle, Student B’s mean score increased from a 6 to an 8.8 and Student C’s mean score increased from a 5.8 to a 9.6. Similar to Student A, Student C’s errors stemmed from spelling mistakes which changed the identification of the word. For example, Student C identified “mujer” as “women” instead of the correct answer, “woman.” In the second cycle, Student B’s mean score increased from a 7.2 to an 8 and Student C’s mean score increased from a 7.4 to an 8.2. Student C’s errors during the second intervention were strictly identification errors. These findings also contradict the findings of Campos, González and Amor (2003) which suggest that the rote method was more effective than the keyword method when used with adolescents.

Contradictory to the findings of Fritz et al. (2007), the keyword method again proved to be more successful when productive language was assessed. Typically, productive language is more difficult to learn than receptive language (Fritz et al., 2007). This is due to the fact that students must remember unfamiliar writing and sound patterns in a foreign language (Beaton et al., 2005). During the first baseline-intervention cycle,

Student A's mean score increased from a 7 to a 10. Student A used the word bank carefully because she did not feel as confident remembering the correct spelling in Spanish resulting in scoring a 10 on all assessments during the first intervention cycle. In the second cycle, similar results were found with a mean score increase from 7.8 to a 10. Student B and C displayed comparable results. During the first baseline-intervention cycle, Student B's mean score increased from 6.6 to 10 and Student C's mean score increased from 5.4 to 10. Student B and C also scored a 10 on all assessments during the first intervention cycle. During the second intervention cycle, Student B's mean score increased slightly from a 7 to a 7.4. Student B's mean score for the second intervention cycle is significantly lower from her mean score for the first intervention cycle. This could be due to the fact that during the second intervention cycle, our classroom was relocated to the cafeteria. There were other students and cafeteria workers in the cafeteria during the instruction and assessment portions of the intervention phase. The student displayed signs of distraction and frustration throughout the second intervention cycle. Student C's mean score increased from a 7 to 8.6 during the second intervention cycle.

Limitations

This study was affected by several possible limitations. The first was the creation of the keyword visual and picture associated with the foreign language vocabulary word. There were possibly stronger keyword connections with the first set of vocabulary words than the second set. The students' mean scores were higher when productive vocabulary was assessed with the first intervention cycle than the second intervention cycle.

Another possible limitation was the new classroom environment during the second intervention phase. State mandated testing caused our current classroom to be

used by another class and in turn, merged the World Cultures class with another basic skills class in a secondary location. In order to find an additional location that would be feasible to continue with the study, we were left to use the cafeteria. The first few days there were many distractions in the cafeteria. The cafeteria workers were playing music as they were preparing for the day. There were other students and teachers organizing food in the cafeteria as well. The students took longer to complete the assessments and were showing signs of frustration. Even though the students and I sat across the cafeteria, as far away from the distractions as possible, it could have been enough to affect student outcomes.

The last possible limitation to consider is the sample size. Other students in the World Cultures class were asked to participate but the parents did not give consent. This led for the study to be implemented with only three students. It is difficult to gage true effectiveness with such a small sample size.

Implications and Recommendations

This study adds to the existing research on the effectiveness of the keyword mnemonic method in the foreign language classroom. In addition, it is significant because it provides data on the keyword mnemonic method in the foreign language classroom for students with learning disabilities. There is a gap in the research on strategies for students with learning disabilities in the foreign language classroom. Many public schools today mandate that every child receive foreign language education. In addition, more students with learning disabilities are placed in the general classroom population. There is a demand for more research with the special education population. There is also a demand for more research with middle school special education students.

The keyword mnemonic strategy is a relatively easy strategy to implement. Teachers need very little training on the strategy in order to implement effectively. The strategy works best with concrete vocabulary which highly benefits foreign language students during early stages of foreign language learning. More research is needed with a larger sample size to evaluate the strategy effectiveness. Also, research must be conducted over a longer period of time to assess long-term vocabulary acquisition.

From survey results, the students involved in the study all agreed that the study helped them learn the meaning of the new vocabulary words. All of the students also enjoyed using the keyword mnemonic method in the foreign language classroom. Student motivation can also be a factor to determining success in school. When students are using a strategy they enjoy, in turn, the students may be more successful.

Conclusions

To conclude, it is evident that the keyword mnemonic method was a successful intervention strategy when assessing receptive foreign language vocabulary and productive foreign language vocabulary for students with learning disabilities. In addition, the students enjoyed using the intervention method to acquire new vocabulary. Further research is needed with a larger sample size to assess the effectiveness of the keyword mnemonic method for foreign language with students with learning disabilities. Moreover, further research over an extended period of time is needed to assess long term foreign language acquisition.

References

- Amiryousefi, M. & Ketabi, S. (2011). Mnemonic instruction: A way to boost vocabulary learning and recall. *Journal of Language Teaching and Research*, 2(1), 178-182, doi: 10.4304/jltr.2.1.178-182
- Beaton, A. A., Gruneberg, M. M., Hyde, C., Shufflebottom, A. & Sykes, R. N. (2005). Facilitation of receptive and productive foreign vocabulary learning using the keyword method: The role of image quality. *Psychology Press*, 13(5), 458-471, doi:10.1080/09658210444000395
- Berne, J. I. & Blachowicz, C. L. Z. (2008). What reading teachers say about vocabulary instruction: Voices from the classroom. *The Reading Teacher*, 62(4), 314-323, doi: 10.1598/RT.62.4.4
- Biemiller, A. (2003). Vocabulary: Needed if more children are to read well. *Reading Psychology*, 24(3-4), 323-335, doi: 10.1080/02702710390227297
- Campos, A., Amor, A. & González, M.A. (2004). The importance of the keyword-generation method in keyword mnemonics. *Experimental Psychology*, 51(2), 125-131, doi: 10.1027/1618-3169.51.2.125
- Campos, A., González, M. A. & Amor, A. (2003). Limitations of the mnemonic-keyword method. *The Journal of General Psychology*, 130(4), 339-413.
- Conduis, M. M., Marshall, K. J. & Miller, S. R. (1986). Effects of the keyword mnemonic strategy on vocabulary acquisition and maintenance by learning disabled children. *Journal of Learning Disabilities*, 19,(10), 609-613.
- DiFino, S. M. & Lombardino, L.J. (2004). Language learning disabilities: The ultimate foreign language challenge. *Foreign Language Annals*, 37(3), 390-400.
- Foil, C. R. & Alber, S.R. (2002). Fun and effective ways to build your students' vocabulary. *Intervention in School and Clinic*, 37(3), 131-139.
- Fritz, C.O., Morris, P.E., Acton, M., Voelkel, A.R. & Etkind, R. (2007). Comparing and combining retrieval practice and the keyword mnemonic for foreign vocabulary learning. *Applied Cognitive Psychology*, 24, 499-526, doi: 10.1002/acp.1287
- Ganschow, L. & Sparks, R. L. (2000). Reflections on foreign language study for students with language learning problems: Research, issues and challenges. *Dyslexia*, 6(2), 87-100.
- Ganschow, L., Sparks, R. L. & Javorksy, J. (1998). Foreign language learning difficulties: An historical perspective. *Journal of Learning Disabilities*, 31(3), 248-258.

- Joshi, R. M. (2005). Vocabulary: A critical component of comprehension. *Reading & Writing Quarterly*, 21(3), 209-219, doi: 10.1080/10573560590949278
- Kasper, L.F. (1993). The keyword method and foreign language vocabulary learning: A rationale for its use. *Foreign Language Annals*, 26(2), 244-251.
- Kuder, S. J. (2017). Vocabulary instruction for secondary students with reading disabilities: An updated research review. *Learning Disability Quarterly*, 40(3), 155-164, doi: 10.1177/0731948717690113
- Leons, E., Herbert, C. & Gobbo, K. (2009). Students with learning disabilities and AD/HD in the foreign language classroom: Supporting students and instructors. *Foreign Language Annals*, 42(1), 42-54.
- Mastropieri, M. A., Scruggs, T. E., Levin, J. R., Gaffney, J. & McLoone, B. (1985). Mnemonic vocabulary instruction for learning disabled students. *Learning Disability Quarterly*, 8(1), 57-63.
- Mastropieri, M. A., Scruggs, T. E. & Mushinski Fulk, B. J. (1990) Teaching abstract vocabulary with the keyword method: Effects on recall and comprehension. *Journal of Learning*, 23(2), 92-96.
- New Jersey Department of Education. (2008). N.J.A.C. 6A:8-5. Retrieved from <http://www.nj.gov/education/aps/cccs/wl/faq.htm>
- Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology*, 45(3), 255-287.
- Paivio, A. & Lambert, W. (1981). Dual coding and bilingual memory. *Journal of Verbal Learning and Verbal Behavior*, 20, 532-539.
- Roberts, G., Torgesen, J. K., Boardman, A. & Scammacca, N. (2008). Evidence-based strategies for reading instruction of older students with learning disabilities. *Learning Disabilities Research & Practice*, 23(2), 63-60.
- Sagarra, N & Alba, M. (2006). The key is in the keyword: L2 vocabulary learning methods with beginning learners of Spanish. *The Modern Language Journal*, 90(2), 228-243.
- Shapiro, A. M. & Waters, D. L. (2005). An investigation of the cognitive processes underlying the keyword method of foreign vocabulary learning. *Language Teaching Research*, 9(2), 129-146, doi: 10.1191/1362168805lr151oa
- Wolgemuth, J.R., Cobb, R. B. & Alwell, M. (2008). The effects of mnemonic interventions on academic outcomes for youth with disabilities: A systematic review. *Learning Disabilities Research & Practice*, 23(1), 1-10.