8-25-2015

The effects of parental involvement on vocabulary acquisition of male, middle school students with autism spectrum disorder

Katie Schoenung

The Effects of Parental Involvement on Vocabulary Acquisition of Male, Middle School Students with Autism Spectrum Disorder

By

Katie R. Schoenung

A Graduate Field Experience

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

Urban Special Education

At Cardinal Stritch University

Milwaukee, Wisconsin

2015

This Graduate Field Experience

For Katie Schoenung

Has been approved for

Cardinal Stritch University by

D. Rose Coppins, Ed.D. Digitally signed by D. Rose Coppins, Ed.D.
DN: cn=D. Rose Coppins, Ed.D., o, ou, email=dr.coppins@sbcglobal.net, c=US
Date: 2015.08.24 20:29:14 -05'00'

(Advisor)

August 24, 2015

(Date)

Acknowledgments

Firstly, I would like to express my sincere gratitude to my thesis advisor Dr. D. Rose Coppins for her patience and support through this process. Her immense knowledge was invaluable and helped guide this action research project from its beginning stages to the culmination of this thesis. I am also grateful for the motivation and understanding she provided when tasks appeared overwhelming, which was instrumental in the successful completion of the process.

In addition, my sincere appreciation goes to my family: my husband, my daughters, and my parents for supporting me throughout this action research project, providing words of encouragement, and being the inspiration I needed to pursue this project to the end.

Abstract

The study investigated the impact of parental involvement on vocabulary acquisition of male, middle school students with Autism Spectrum Disorder (ASD). Five participants engaged in vocabulary acquisition strategies in class and at home with parents for eight weeks. Researchers hypothesized that parental involvement would increase vocabulary acquisition. Parental involvement was the independent variable, and vocabulary assessments were the dependent variable. Two research questions were: (a) What vocabulary instructional strategy used by parents increased performance on weekly vocabulary assessments? and (b) What classroom instructional vocabulary strategy improved vocabulary acquisition of male, middle school students with ASD? Results indicated participants' vocabulary acquisition was statistically significant at a .05 level of significance. Vocabulary games were most effective at home and definition-matching activities were most effective in class.

Table of Contents

List of Tables

Table Page

List of Figures

Graph Page

Chapter I

INTRODUCTION

Parental involvement has always been a key factor to student success in the educational setting. Educational facilities are always trying to uncover new methods to increase parental engagement in academics. George and Mensah (2010) study revealed that when parents were involved in the school environment, students exhibited better attendance, less behavioral problems, and less homework difficulty. Research shows student success is present when parents utilize every opportunity to encourage and support children through instructional activities. In addition, Adamski, Fraser, and Peiro (2013) study discovered that parental involvement influenced student opinions regarding education. Students do not only do better in the classroom when parents become involved in school-related activities but also value the education being delivered. If parents present education as important and valuable, students frequently adopt those same patterns of belief.

However, when individuals with Autism Spectrum Disorder (ASD) are taken into consideration, the effects of parental involvement are not as definite. Individuals with ASD experience relationships differently, and therefore, every event in which relationships would normally have an impact, the effect it would have on students with ASD is unclear. Kelly, Garnett, Attwood, and Peterson (2008) study discovered students with ASD were effected more by family involvement than peer involvement as it related to emotional afflictions. In addition, Boyd, McDonough, Rupp, Khan, and Bodfish (2011) study revealed parental involvement resulted in a decrease of maladaptive behaviors and an increase in appropriate behaviors for children with ASD. This demonstrated the importance of parents when considering the emotional and behavioral stability of individuals with ASD. Vacco (2002) study discovered

parental involvement was necessary for success for students with ASD and was encouraged through collaborative relationships with educators. This demonstrated the importance of parent-teacher collaboration for students to be successful in an academic setting, but the extent and impact of parental involvement on academic activities is unclear.

Vocabulary acquisition has always been reinforced in the educational setting. Larger vocabularies has been linked to higher levels of comprehension and is, therefore, heavily emphasized in all subjects. As a result, strategies to increase student vocabulary are a topic often researched. Walters and Bozkurt (2009) study revealed vocabulary notebooks are an effective means to increase vocabulary acquisition, and students had positive feelings towards use of the notebooks. In addition, Orawiwatnakul (2011) study discovered that utilizing multiple strategies designed to address all facets of vocabulary words and meanings was beneficial in the procurement of target vocabulary words. This demonstrated that students respond positively to novel vocabulary activities and have increased success in the acquisition of target words. Howrey and Quinn (2016) study revealed that the use of online and paper based materials were both effective means to increase vocabulary acquisition, but the most effective resource was educator assistance. This demonstrated the importance of the involvement of individuals to increase vocabulary acquisition. New materials are useful when engaging individuals in instruction, but the assistance of educators presents a more significant impact. Wei and Attan (2014) study discovered that providing different options for students to choose from when engaging in vocabulary activities increased student success and fostered independent learning practices. This demonstrates the importance of not only providing students with different strategies but allowing opportunities to utilize the tools at the students' discretion. This technique

respects individual learning styles and encourages students to take responsibility for their learning.

When considering individuals with disabilities, the acquisition of vocabulary is vital. Unfortunately, the process of acquiring vocabulary for individuals with disabilities is often a struggle. Individuals with disabilities struggle with retention of information and must work twice as hard to recuperate what is lost. Therefore, developing strategies to help make the content more engaging and more concrete for individuals with disabilities is imperative. Dada and Alant (2009) study revealed the use of visual aids and manipulatives was an effective means to increase vocabulary acquisition for individuals with limited or no functional speech. In addition, Moore and Calvert (2000) study discovered utilizing computer technology to supplement teacher led instruction was a valuable instructional strategy when increasing vocabulary acquisition for students with ASD due to the added visual and auditory stimulation computers provide. This demonstrates the effectiveness of visual and auditory resources, manipulatives, and technology when working with populations with disabilities. Traditional methods of instruction are not enough to help students retain material, instructors need to develop novel activities to enhance student learning.

This study focused on vocabulary acquisition and assessed both participant spelling and definition matching capabilities following the implementation of vocabulary acquisition strategies at home with parents. This study aligned to the Common Core Essential Elements. The Reading standards under the Range of Reading and Level of Text Complexity category both for literature (Standard EE.RL.6/7/8.10) and informational texts (standard EE.R.I.6/7/8.10) were addressed. These standards required that students be able to understand multiple types of literature presented. The study supported these standards by encouraging students to read and

define words within the text, thereby increasing comprehension of the text, and providing examples of the vocabulary words in context to increase awareness of the proper usage of the target words.

The Language standard under the Knowledge of Language category (EE.L.6/7/8.2), which required that students used vocabulary to express a given idea adequately, was addressed. Participants' increased vocabulary acquisition supported the standard of labeling specific ideas with proper language when communicating. In addition, the Language standards under the Vocabulary Acquisition and Use category (EE.L.6/7/8.4 and EE.L.6/7/8.6), which required participants be able to demonstrate comprehension of definitions for target words and use the target words in context, were addressed. Exposure to the words in context during the weekly activities and assessments were provided. Researchers embedded activities related to the Wisconsin Common Core Essential Elements standards set in assessments, in classroom activities, and home activities. The following section details the problem that inspired the study.

Statement of the Problem

It is important to understand the impact of parental involvement on children with Austim Spectrum Disorder because children with this disorder understand and value relationships differently than individuals without ASD. Kelly, Garnett, Attwood, and Candida (2008) study explained that children with ASD struggle with understanding the point-of-view of other individuals, empathizing with others, seeing issues from different angles, and understanding rationale in common social situations. Therefore, it was questionable whether children with ASD would have experienced the typical academic success seen in a nondisabled child when provided with parents that value and support education. Would children with ASD incorporate

the values related to education adopted by their own parents when provided additional support at home, or would the increase in parental support not influence children with ASD?

In addition, individuals with ASD experience difficulty engaging in customary instructional methods. Attending to educational material presented in the route of traditional lectures is challenging for students with ASD. Kelly, Garnett, Attwood, and Candida (2008) study suggested that in order to instruct children with ASD, instructors needed to engage students in instruction in ways that supplement the traditional method, which offered only verbal reinforcement. Moore and Calvert (2000) conducted a study demonstrating enhanced vocabulary acquisition for students with ASD through the use of more prominent reinforces such as sounds or movement when correct responses were given. Individuals with ASD require hands-on, sensory enriched experiences to attend to instructional content. Considering past information, the researcher incorporated more game playing opportunities with parents to increase vocabulary acquisition for the purposes of this study. The following section addresses the purpose of the study.

Purpose of the Study

As the full effects of parental involvement are unknown when working with a population with ASD, it is necessary to conduct further research to ensure the needs of individuals with ASD are meet to facilitate success. The purpose of this action research project was to determine what effects parental involvement had on vocabulary acquisition of male, middle school students with Autism Spectrum Disorder. The researcher hypothesized that parental involvement would increase vocabulary acquisition of male, middle school students with ASD. The null hypothesis stated that there would be no increase in vocabulary acquisition of male, middle school students with ASD. Parental involvement demonstrated through the completion of specific vocabulary

activities served as the independent variable. The scores on the weekly vocabulary assessments served as the dependent variable. In addition, two research questions were addressed for the purpose of this study: (a) What vocabulary instructional strategy used by parents increased performance on weekly vocabulary assessments? and (b) What classroom instructional vocabulary strategy improved vocabulary acquisition of male, middle school students with Autism Spectrum Disorder?

Rationale for the Study

Research shows parents are a source of support and encouragement for students. Students can rely on parents to be there to assist with schoolwork and provide reassurance when tasks are difficult, and the impact of parents during these situations is invaluable. Research confirms that students excel when parental involvement is present. However, when considering students with ASD, the impact of parental involvement is not always clear. It is known that students with ASD experience relationships differently than individuals without ASD. Therefore, it can be questioned whether students with ASD obtain the same benefits of parental involvement as students without ASD. Parental involvement is a significant factor in the success of students without ASD, and the effects of this involvement on students with ASD should be further explored to understand its influence in addition to uncovering the most successful strategies parents can implement at home to assist their child with ASD. Therefore, the researcher decided to explore the effects of the relationship between parents and children with ASD further.

In addition, due to the struggles experienced by individuals with ASD involving communication and language, the researcher decided to focus this study on effective vocabulary acquisition strategies. By expanding vocabulary knowledge, students' comprehension would

increase. The increase in comprehension would be invaluable for individuals with ASD who may require additional support to access curriculum. In addition, the increase in comprehension would enhance understanding of the content received during social interactions, thereby allowing the student the opportunity to focus on the mechanics of the interaction, a struggle for with individuals with ASD. The following section details the setting and timelines of the study, in addition to the population of participants involved.

Setting, Population, and Timeline

This action research project was implemented during the spring semester of the 2014 – 2015 school year during the months of April, May, and June at a public school located in an urban setting in Milwaukee, Wisconsin for a period of eight consecutive weeks. Strategies were implemented at home Monday through Thursday and in class on Tuesdays and Thursdays. The school was in its second year and provided preschool through eighth grade classes with six comprehensive units, three elementary ASD units, one middle school ASD unit, one elementary Emotional Behavioral Disorder (EBD) unit, and one middle school EBD unit. The facility was a combination of an elementary school and a middle school within the same district and focused on an arts integration approach to education.

Participants were selected from a classroom of individuals who required additional sensory supports for engagement purposes and an environment sensitive to the overstimulation many individuals with autism experience. The students required considerable one-on-one support from special education staff, in addition to an alternate curriculum based on the Wisconsin Common Core State Standards. The alternate curriculum followed the Common Core Essential Elements, a set of standards that covered only second to third grade level material through high school graduation. Students instructed with the Common Core Essential Elements

were not eligible to receive a high school diploma upon graduation but instead a certificate of completion. The students required extensive behavioral support and social skill training. A regular education setting was unable to meet these needs; therefore students required a more restrictive environment and had placements in a comprehensive autism unit. Students engaged in all instructional classes with their special education peers including specialty courses such as gym, art, and music. However, the students had the option to engage in non-academic activities with their non-disabled peers such as clubs and sports, were included in all school assemblies, and participated in grade level field trips with their nondisabled peers.

Students placed in the comprehensive ASD unit struggled with expressing themselves. When provided with opportunities to engage in discussions, students independently produced only one word. Some students communicated through the process of selecting a visual from a choice of three options. Students struggled with producing simple sentences during both verbal and written activities. Students within the classroom required hands on opportunities to keep their attention focused on new instructional concepts instead of traditional lecturing methods. Many students within the classroom-required hand over hand support to complete activities, which was provided through the support of the classroom staff including the instructor, the paraprofessional, and the children's healthcare assistant. The following section provides definitions to terms presented in the study.

Definition of Terms

Parental Involvement. Communication with the researcher and completion of at home activities with students.

Vocabulary Acquisition. The successful completion of a productive spelling assessment and a receptive definition matching assessment.

The review of literature in Chapter 2 addresses prior research that utilized variables related to this action research project. The first section focused on the effects of parental involvement on academic success. The second section viewed parental involvement as it related to students with ASD. The final section addressed vocabulary acquisition techniques studied on populations with English as a second language and populations with disabilities. Moreover, the chapter explores an alternate approach to traditional lecture based instruction to use with students with ASD and other disabilities and English language learners.

Chapter II

REVIEW OF LITERATURE

The effects of parental involvement on children with Autism Spectrum Disorder (ASD) has been a questioning matter due to the social struggles individuals with ASD experience (Kelly, Garnett, Attwood, & Peterson, 2008). The results typical of children without ASD have indicated parental involvement was a large factor in fostering a child's investment in educational success (Adamski, Fraser, & Peiro, 2013). Children frequently adopted the same beliefs and opinions of their family, so when parents emphasized the importance of academia, children were more likely to value education in the same way. However, students with ASD viewed relationships from a different lens. Thus, the association between parental involvement in children with ASD and academic success was multifaceted and required additional assessment to determine its effectiveness.

Vocabulary acquisition was an important facet of education for students with ASD as many of these students lived with little or no functional speech, so it was difficult to determine how students with ASD best acquired vocabulary. Therefore, direct instruction in various vocabulary acquisition strategies was imperative to determine what worked best for the students and ensure the students received the additional supports necessary for them to succeed. In addition, the benefits attributed to increased vocabulary acquisition were invaluable. Vocabulary activities provided students with a deeper understanding of language and its uses. Even if students had knowledge of the words, opportunities for review were essential for students that struggled with retaining information. In addition, Walters and Bozkurt (2009) conducted a study with results indicating the implementation of vocabulary activities resulted in utilization of target words, introduced through previous weeks, in writing compositions. Moore and Calvert (2000) conducted a study with results indicating the implementation of vocabulary activities also resulted in higher levels of recall for students with ASD. The more engaging techniques introduced, the higher the retention levels students exhibited. The subsequent section addressed vocabulary acquisition techniques studied on populations with English as a second language and populations with disabilities.

Parental Involvement

Parental Involvement with Homework

George and Mensah (2010) conducted a study to explore the effects of parental involvement on student homework for Ghanaian students. George and Mensah (2010) sought to determine to what degree parents engaged in their child's homework and the primary struggles parents faced when assisting their child in their homework. The researchers also wanted to analyze the relationship between parents, their child's school, and its staff. Finally, George and

Mensah (2010) wanted to measure how parental involvement with a child's homework affected the child's academic success. The researchers addressed multiple research questions. 1) To what degree did parents support their children with homework? 2) Did relationships exist between parents, their child's school, and its staff? 3) How did parental involvement affect their child's homework? 4) What struggles did teachers and parents face in regards to homework? George and Mensah (2010) hypothesized that there was a significant relationship between parental involvement and homework as it related to the attainment of academic success. The null hypothesis was a significant relationship did not exist between parental involvement and homework as it pertained to students' academic success. The researchers used homework as the dependent variable and the extent of parental involvement in the home and school as the independent variable. The researchers defined parental involvement as assisting in the school environment, maintaining open lines of communication with teachers, supporting their child in educational activities in the home environment, and participating in various school events and meetings.

Participants, randomly selected from eight of 50 schools within the Central Region of Ghana in the Cape Coast municipality, included 88 students, 88 parents, and 32 teachers issued questionnaires and 30 parents and teachers given interviews. The parent participant ages ranged from 19 to 75. About 50% of the parents were married, 22% were divorced, and 26% were guardians. At least 89% of parent participants had completed some level of schooling. About 55% of the parents worked full time, about 22% worked part time and about 22% did not work. The sex and race/ethnicity of the parents was not explicitly stated. The student participant ages ranged from one to 17 with 65% of the population being female. The researchers did not explicitly state additional demographic data on the participants.

George and Mensah (2010) visited the student and parent participants nine times through the course of the study to obtain the necessary data. The researchers studied school attendance records and visited classrooms to analyze student homework samples. All homework involved in the study was a review of material already presented in class. The researchers also went to student homes to address unresolved issues presented by teachers, students, and parents. Following the data collection, George and Mensah (2010) utilized SPSS to review the information. The researchers recorded all interviews to review the data in depth afterwards. The researchers took note of the differences and similarities found in the discussions.

George and Mensah (2010) found that students with parents more engaged in their school environment had better attendance, less tardiness, and fewer problematic issues related to poverty. The researchers found that when fathers were present in their child's education, the child achieved greater success than found when only mothers engaged in their child's academics. The researchers also found that 60% of parents felt their approaches to solving problems on their child's homework was confusing to the child and had complaints regarding this, which 75% of parent felt caused a divide between home and school. Therefore, about 65% of students had homework difficulties due to parental inattention regarding how to complete the homework.

George and Mensah (2010) concluded that even though parental involvement had a negative impact on student achievement at times, the positive relationship between parental involvement and student's educational success was more apparent. The researchers also concluded that when schools actively try to engage parents, families were more likely to become involved.

The findings of George and Mensah (2010) supported the idea that parental involvement was a big influence on student success. The researchers also supported the idea that schools

needed to initiate communication with parents to increase beneficial parental involvement. The next study by Adamski, Fraser, and Peiro (2013) focused on student perceptions related to parental involvement in academia.

Student Perceptions of Parental Involvement

Adamski, Fraser, and Peiro (2013) conducted a study to analyze the effects of parental involvement in relation to education, the classroom environment, and academic success. The purpose for the study was to authenticate adapted Spanish resources, assess student opinions regarding parental involvement and the different aspects of education, and assess student opinions regarding the Spanish educational environment and student thoughts on Spanish achievement. The researchers also analyzed the similar and different influences in a student's home and classroom environments against the varying student opinions and abilities in Spanish instruction. Adamski et al. (2013) used student outcomes, such as their attitudes and educational success regarding Spanish instruction, as a dependent variable. The researchers used parental involvement and the Spanish classroom environment as independent variables. The researchers did not explicitly state research questions or a hypothesis.

Participants for the study included 223 students in grades 4th through 6th attending an elementary school with a Bilingual Education Program in Miami South Beach, FL. The students were enrolled in nine various Spanish-for-Spanish speakers courses. The school contained 40 nationalities, with a Hispanic population accounting for 79% of the student body. The researchers did not explicitly state additional demographic data on the participants.

Students were tasked with completing the What is Happening in this Class? (WIHIC) assessment. The WIHIC categories assessed were Student Cohesiveness, Teacher Support,

Involvement, Task Orientation, Cooperation, and Equity. The researchers first converted the assessment to Spanish, tested it with a sample of individuals, and then removed 12 items and left 36 items based on comprehension after the translation process. The students also needed to complete the Test of Spanish Related Attitudes – L (TOSRA-L). The researchers modified the TOSRA-L to assess students opinions related to Spanish. The tool contained 20 items before modification and 14 items afterwards. The researchers selected two of seven scales from the tool to measure student attitudes and enjoyment of Spanish. Finally, students completed a six-item parental involvement questionnaire the researchers titled Student Perceptions of Parental Involvement Scale. This scale assessed student opinions of parental involvement as it pertained to Spanish courses.

Adamski et al. (2013) assessed various components of education, but the purpose of the research study pertained to parental involvement was the only area of interest. Adamski et al. (2013) found a positive, significant ($p < 0.01$) correlation between the WIHIC Student Cohesiveness (0.92) and Cooperation (0.85) categories and developed Student Perceptions of Parental Involvement Scale.

Adamski et al. (2013) concluded that there was a strong relationship between parental involvement and a student's education, classroom environment, and academic success. Adamski et al. (2013) concluded a student's opinions about the courses was influenced most by the student's home environment, but a student's academic success was influenced most by the educational environment. The results supported the idea that the degree to which a parent was engaged in their child's academic career influenced the educational success that child would have because a child's attitude contributed to their willingness to learn during instruction. The

next section focused on the effects of parental involvement on children with Autism Spectrum Disorder.

Parental Involvement and Autism

Impact of Family Relationships

Kelly, Garnett, Attwood, and Peterson (2008) conducted a study to measure the possible effects of family struggle or solidity as well as peer support or bullying on children with Autism Spectrum Disorder (ASD). The purpose for the study was to analyze the effects of family and peer relationships on common symptoms associated with ASD in children and on depression or anxiety symptoms in children with ASD. The researchers questioned if the characteristic effects family and peer relationships had on childhood anxiety and depression generalized to children with ASD. The researchers addressed multiple hypotheses. 1) Common Autism Spectrum Disorder symptoms had a significant, positive relationship with symptoms of anxiety and depression. 2a/b) Family struggle/peer bulling fostered ASD symptoms through indicators of anxiety and depression. 3a/b) Family solidity/peer support negatively fostered ASD symptoms through indicators of anxiety and depression. 4) Bullying and family struggles had a greater impact on ASD symptoms than peer support and family solidity. The researchers did not explicitly state a null hypothesis. The independent variables used in the study were family struggle/solidity and peer support/bullying. The dependent variables used in the study were anxiety and depression in children with ASD.

Participants included 322 parents of children with ASD symptoms referred to two different specialist clinics, with the first appointment having occurred between the years 2003-2006. Of the children of the parents, 76 had Autism Spectrum Disorder, 188 had Asperger

Disorder, 21 had Pervasive Disorder not otherwise specified, and 37 children had no diagnosis but higher social cognitive concerns. The ASD symptoms within the group ranged from high to low severity. Someone in either the home or school environment had suspected the children of the participants to have had ASD. The parents all had children in the age range of 6 – 16 years. Participants removed from the study had children who were either inpatient at a hospital or had an ASD diagnosis paired with Schizophrenia. The researchers did not explicitly state additional demographic data on the participants.

Kelly et al. (2008) used five different tools to collect data for the study. Parents completed the Australian Scale for Autism Spectrum Disorder (ASASD). The ASASP was a 46-item assessment used to measure five aspects of ASD, which included understanding emotion, perspective taking, sensory sensitivity, cognitive and behavioral rigidity, and fact orientation. To assess the struggle or the solidity of a family, the researchers used the 18-item Family Environment Scale – Real Form (FES-R), which required parents to rate each item as true or false. To measure data related to the peer variables, researchers had parents complete the Spence Social Competence Questionnaire – Parent Form (SCQ) and the Bullying and Teasing Questionnaire (BTQ). The SCQ was composed of nine items meant to measure the magnitude of meaningful social relationships. The BTQ was composed of 15 items meant to measure the degree to which peers bullied their child. Researchers then used the five-item emotion subscale of the Anxiety/Depression – Strengths and Difficulties Questionnaire – Parent Form (SDQ P) to measure the emotional regulation of three to 16 year old children.

Kelly et al. (2008) offered all participants choices between a questionnaire on paper or via the internet. The researchers mailed all participants information regarding confidentiality and directions about how to access the website including information regarding PIN numbers

and passwords. Participants had the option to call if they required additional support. Questionnaires done over the internet took one to one and a half hours to complete. Participants were able to complete each questionnaire at different times but in order to submit a questionnaire every item required a response. The researchers downloaded all of the response data from the website without names attributed to it, ensuring complete confidentiality. If after a month, questionnaires were still incomplete, the researchers called the participants to provide a reminder to finish the forms.

The results provided an unstandardized regression coefficient of 2.20, $p < 0.001$ for the anxiety/depression and ASD symptoms. Therefore, the results supported the first hypothesis. Common Autism Spectrum Disorder symptoms did have a significant, positive relationship with symptoms of anxiety and depression.

The results supported family impact as stated in the second hypothesis with significant relationships appearing between family struggle and symptoms of anxiety/depression (B= 0.28, $p < 0.001$, 95%, CIs = 0.13-0.37) and between ASD and anxiety/depressions symptoms (B = 2.2, $p < 0.001$ 95% Cis = 1.69-2.71). The results did not support peer impact as stated in the second hypothesis. Family struggle did foster ASD symptoms through indicators of anxiety and depression, while peer bulling did not.

The researchers found a significant, negative relationship with family impact as stated in the third hypothesis (B = -0.21, $p < 0.01$, 95% Cis = -0.348 to -0.072), but did not support peer impact as stated in the third hypothesis. Family solidity did negatively foster ASD symptoms through indicators of anxiety and depression, while peer support did not.

The researchers found a significant, negative relationship as stated in the fourth hypothesis (B = -0.54, $p < 0.001$, 95% Cis = 0.47-0.65). Bullying and family struggles did have a greater impact on ASD symptoms than peer support and family solidity.

Kelly et al. (2008) concluded there was a significant relationship between ASD and anxiety/depression symptoms. The family impact variable provided stronger predictors of ASD symptoms through indicators of anxiety/depression than the peer impact variable. Negative experiences had a stronger impact on ASD and anxiety/depression symptoms than positive experiences.

The findings from Kelly et al. (2008) supported the idea that parental involvement did affect students with ASD. If a student with ASD experienced family struggle, they experienced more ASD and anxiety/depression symptoms, which directly affected their attentiveness at school. If a student with ASD experienced family solidity, that student experienced less ASD and anxiety/depression symptoms, which directly affected their success at school. The next study by Wachtel and Carter (2008) focused on how parents' responses to their child's ASD diagnosis affected their parenting styles.

Response to Diagnosis and Parenting Style

Wachtel and Carter (2008) conducted a study to determine if the way mothers felt in regards to their children's Autism Spectrum Disorder (ASD) diagnosis was associated with their capability to interact with their children in ways that would be ideal for the future development of their children. The purpose of the study was to assess the impact mothers' acceptance of their children's ASD diagnosis had on parenting style. Wachtel and Carter (2008) hypothesized the mothers' acceptance of the ASD diagnosis of their children influenced parenting styles. The

researchers did not explicitly state a null hypothesis. For the independent variable, researchers observed the mothers' acceptance of their children's ASD diagnosis, identified as either emotional resolution, unresolved, or acceptance. For the dependent variable, researchers observed parenting styles such as supportive engagement, cognitive engagement, and disengaged. The researchers did not explicitly state research questions.

To complete this study, researchers collected data as part of a larger study. Researchers recruited participants from the study, which assessed developing patterns of children with ASD and their relatives. Researchers enrolled participants from physician referrals, related seminars, and autism intervention and early intervention programs. Researchers did not explicitly state additional demographic data on the participants or the procedures for this study.

Wachtel and Cater (2008) recruited 63 children with an ASD diagnosis between the ages of 20 – 50 months to participate in the study with their mothers. Of the child participants, 48 were male and 15 were female. Of the child participants, 53 were white, two were Asian, three were Hispanic, and five were more than one race. The household incomes for the participants primarily ranged from $40,000 - $150,000. Most of the mothers were married with some college education. The researchers did not explicitly state additional demographic data on the participants.

Wachtel and Carter (2008) used the Autism Diagnostic Interview-Revised to determine ASD diagnostic standing of children and the Autism Diagnostic Observation Schedule to measure social and expressive abilities of children. The researchers also used the Mullen Scales of Early Learning to measure motor skills and language functioning of children and the Infant Toddler Social Emotional Adjustment Scales to measure social emotional challenges and strengths of children. The Center for Epidemiologic Studies Depression Inventory functioned as

a means to measure symptoms of depression in mothers. The researchers used the Reaction to Diagnosis Interview to measure if the mothers' grief was resolved or unresolved and the Parent-Child Interaction Rating Scales to measure interactions between mothers and their children. Researchers also asked the families to come on their third visit of either the first or the second year of the initial, larger study or to come in for an addition visit to complete the Reaction to Diagnosis Interview. Researchers compensated participants $50.00 for completing the interviews and $50.00 for the extra visit.

Wachtel and Carter (2008) found a significant relationship (0.28 bivariate correlation) between the emotional resolution of the mothers and the use of the supportive engagement parenting style. Therefore, the researchers further analyzed the emotional resolution variable against various child characteristics from the ITSEA domains such as competence ($r = 0.38$, $p < 0.01$) and social relatedness ($r = 0.38$, $p < 0.01$), as well as the Mullen verbal composite ($r=0.23$, $p < 0.10$). None of the characteristics had a significant relationship to supportive engagement parenting, so the researchers were able to accept the correlation between emotional resolution and supportive engagement parenting.

Wachtel and Carter (2008) concluded that how a mother felt regarding her child's ASD diagnosis affected how she parented the child. The researchers also concluded that depressive symptoms exhibited by the mothers had no impact on their acceptance of their children's ASD diagnosis or on the parenting styles utilized. This study supported the idea that parental involvement was an important factor in achievement for children with autism. The direction of the parenting style influenced each child's past experiences, which therefore shaped the child as a student later on in life. The next study by Boyd, McDonough, Rupp, Khan, and Bodfish (2011) focused on the effects of a family implemented treatment on children with ASD.

Family Implemented Treatment

Boyd, McDonough, Rupp, Khan, and Bodfish (2011) conducted a study to explore the effects of Family-Implemented Treatment for Behavioral Inflexibility (FITBI) on repetitive behaviors often exhibited by children with a diagnosis of Autism Spectrum Disorder (ASD). The purpose of the study was to collect data following a 12-week implementation period of the FITBI treatment method illustrating its clinical results. Boyd et al. (2011) hypothesized that repetitive behaviors, which are often related to mood and behavioral complications for children with ASD, would decrease with the implementation of FITBI. The researchers did not explicitly state a null hypothesis. The researchers used FITBI as the independent variable of the study and repetitive behaviors as the dependent variable. The researchers did not explicitly state research questions.

A therapist worked in conjunction with parents of five children between the ages of 39 – 65 months with a diagnosis of ASD to implement the FITBI model. While all of the children were male, three of the children were white, one child was black, and one child was biracial. The researchers selected children based on three criteria: 2-6 years of age, diagnosis of ASD, and exhibition of at least two repetitive behaviors according to the parents, which were either recurrent and/or interfered with the child's daily habits. The children involved in the study were not using medication at the start of the study. Children in the study also could not meet the following criteria: exhibition of irregular repetitive behaviors, diagnosis of genetic or psychiatric disorders closely tied to autism, diagnosis of a seizure disorder, or parental unwillingness to commit to FITBI treatment for 12 weeks. The researchers also recorded maternal education for each child. One of the mothers had an Associated Degree, two had Bachelor's Degrees, and two

had Master's Degrees. The researchers did not explicitly state additional demographic data on the participants.

Through the course of 12 weeks, the therapist trained parents in the implementation of FITBI through direct instruction and naturalistic instruction methods. FITBI is a method developed to treat the repetitive behaviors individuals with autism frequently exhibit. The method utilized both direct instruction and naturalistic training. Researchers combined two interventions to achieve results in the FITBI model. The first intervention Response Interruption and Redirection (RIR) required the parent to decrease the child's engagement in the undesirable behavior by verbally or physically stopping the child from doing the behavior and redirecting the child to do something more desirable. This is when the second intervention, Differential Reinforcement of Variability (DRV), occurred. In DRV, children were encouraged to engage in more adaptive behaviors that would be more appropriate to focus on. To implement DRV, parents needed to praise the child whenever they engaged in behaviors outside of the undesirable behavior and ignore the child when they performed the undesirable behavior.

Boyd et al. (2011) used various to scales to collect baseline data before the treatment began to screen potential participants. The Vineland Adaptive Behavior Scale (VABS) measured the developmental functioning of each child. The Repetitive Behavior Scale-Revised (RBS-R) measured the repetitive behaviors exhibited by each child. The Autism Diagnostic Observation Schedule (ADOS) confirmed the ASD diagnosis of each child. Once selected, Boyd et al. (2011) met with parents and gave more information regarding FITBI and repetitive behaviors seen in individuals with autism. Parents and therapists then conducted two five-minute probes each to establish baseline data on each child using the Direct Observation of Repetitive Behaviors in Autism Coding System (DORBA) to measure both the repetitive

behaviors as well as the appropriate behaviors exhibited by each child through the course of the study. Researchers taught parents how to implement FITBI in the home and how to identify environmental situations, which would increase the likelihood of the repetitive behaviors occurring. Researchers also trained parents to teach their children to substitute their repetitive behaviors with more appropriate, adaptive behaviors instead. Parents needed to embed the FITBI model into their daily routines to increase the exposure to the model as well as allow for the gradual release of parental support. At the conclusion of the study, parents and therapists conducted probes once more to measure a change in behaviors.

Boyd et al. (2011) found that at the end of the FITBI treatment, participants' repetitive behaviors decreased to 21-39% for parent probes and 10-45% for therapist probes. Participants appropriate behaviors increased to 42-68% for parent probes and 39-66% for therapist probes.

The researchers found significant declines in the repetitive behaviors exhibited by all children involved in the study. As the children's repetitive behaviors decreased, their appropriate, adaptive behaviors increased. Results from the study showed that consistent parental involvement in the implementation of strategies to decrease typical, repetitive behaviors often exhibited by children with ASD was highly effective. These results supported the idea that parental involvement influenced the success of individuals with Autism Spectrum Disorder (ASD). The next study by Vacco (2002) focused on the importance of adopting a parent and educator collaborative relationship.

Teacher and Parent Collaboration

Vacco (2002) studied the relationship between educators and parents of students with Autism Spectrum Disorder (ASD) to understand how to foster collaboration between the two.

Vacco (2002) hypothesized collaboration needed to be both valued by and valuable to both parties. The researchers did not explicitly state a null hypothesis. The researcher also sought to discover if there was a significant relationship between the quality of a collaborative relationship and different aspects associated with it. The researcher addressed multiple research questions. 1) Was the collaboration between parents and educators appreciated and meaningful? 2) What were the most important characteristics of collaboration? 3) Did additional communication increase the strength of the relationship between educators and parents? 4) Did parental opinions of the student's classroom setting increase the strength of the relationship between educators and parents? 5) Would the collaboration between parents and educators relate to the parental opinions of the student's classroom setting? The researcher used a workshop and a questionnaire as independent variables to measure three dependent variables: quality of parent-teacher relationships, amount of parent-teacher communication, and parent perceptions regarding the classroom environment.

Vacco (2002) used participants in a two-part study. The participants comprised of 13 male and 2 female children and their families as well as 23 educators. The first component of the study was a workshop attended by six parents of children with ASD and 19 teachers. The second component was a mailed questionnaire completed by ten parents of children with ASD and 11 teachers. Of the population in the second phase of the study, five parents and seven teachers had attended the workshop in the first segment. The ten parents included nine mothers and one father. The teachers included ten females and one male. Of the parents that participated in the study, six were over 40 years of age, three were 31-40 years of age, and one was under 30 years of age. All parents had completed high school while six had attended college. Of the teacher participants, seven were over 40 years of age, one was 31-40 years of age, and two were

under 30 years of age. All educators had attended graduate school while only four had completed their graduate programs. Of the educators, five specialized in special education, three specialized in early intervention, one specialized in regular education, one was a paraprofessional, and one was a speech pathologist. All of the educators worked with the child for one to seven hours a day. Two of the eleven educators had never had a student with ASD in their class. The researcher did not explicitly state additional demographic data on the participants.

With the support of the district, Vacco (2002) mailed two different letters to parents and teachers connected to children with ASD asking them to participate in a workshop and a questionnaire. The workshop, offered by the school district two months prior to the questionnaire, focused on parent-teacher collaboration. Following the workshop, Vacco (2002) asked participants to complete the Collaborative Beliefs Scales to get both parent and educator opinions on collaboration and the Discussion Evaluation Scale to evaluate the quality of parent-teacher discussions.

After the workshop, Vacco (2002) mailed questionnaires to interested participants in the middle of the school year. For parents, Vacco (2002) sent the Discussion Evaluation Scale again, the Parent-Teacher Involvement Questionnaire to assess parent opinions of parent-teacher collaborative relationships, and the Parent-Teacher Relationship Scale to gain a better understanding of the quality of these parent-educator relationships. Parents also received the Background Information Form, the Perceived Teacher Outreach Scale to measure parent opinions regarding what educators do to elicit collaborative relationships, and the Classroom Environment Scale to assess parent opinions regarding the quality of the instructional setting. For educators, Vacco (2002) sent the Parent-Teacher Involvement Measure to assess different

educator opinions of parent-teacher collaborative relationships. Teachers also received the Background Information Form, the Parent-Teacher Relationship Scale, the Classroom Environment Scale, and the Discussion Evaluation Scale. All participants completed the questionnaires three months following a parent-teacher collaboration. For individuals that participated in both the workshop and the questionnaire, Vacco (2002) conducted phone surveys to understand how educators and parents felt regarding the collaborative relationship four months after the parent-teacher collaboration.

Vacco (2002) found the collaboration between parents and educators was appreciated and meaningful. The results from the Collaboration Beliefs Scale ($M = 5.78$, $SD = .37$) and the Discussion Evaluation Scale ($M = 4.28$, $SD = .40$) indicated participants had very positive opinions regarding parent-educator collaboration and felt it would yield positive outcomes. The results from the Discussion Evaluation Scale ($r = .418$, $p < .05$) were significantly, positively correlated with the Collaboration Beliefs Scale.

Vacco (2002) also found the most important characteristics of collaboration were strength of the relationship between parent and educator, communication, and classroom setting. Results measuring the relationship between the amount of communication and the strength of the relationship between educators and parents were not significant at $p < .05$. The correlation between the Perceived Teacher Outreach Scale and the Relationship subscale of the Parent-Teacher Involvement Questionnaire ($r = .597$, $p < .069$) was not significant but present. This may indicate that when parents thought educators were trying to contact them, they felt more positive about the collaborative relationship. The correlation between the Joining Subscale and the Communication to Other Subscale of the Parent-Teacher Relationship Scale ($r = .621$, $p < .05$) was significant. This indicates that when educators attempted to contact parents, they felt a

stronger collaborative relationship. Parental opinions of the student's classroom setting and the collaborative relationship between parents and educators were significant in three of four measures. The Joining Subscale of the Parent-Teacher Relationship Scale was significantly correlated with the School Endorsement Subscale of the Parent-Teacher Involvement Questionnaire ($r = .719$, $p < .05$) and the Classroom Environment Scale ($r = .890$, $p < .01$). In addition, the Classroom Environment Scale was significantly correlated with the Relationship Subscale of the Parent-Teacher Involvement Questionnaire ($r = .613$, $p < .06$). However, the collaboration between parents and educators was not significantly correlated to the parental opinions of the student's classroom setting as measured by the Perceived Teacher Outreach Scale and the Classroom Environment Scale ($r = .668$, $p < .05$).

Vacco (2002) concluded that the quality of collaborative relationships was more significant than the number of contacts made by teachers and had a strong correlation with parental opinions regarding the classroom environment. Parents who felt more positive regarding the educator's interest in their child had sincere investment in the collaborative relationship.

The findings from Vacco (2002) supported the idea that parental involvement was necessary for student success, and parents were more likely to engage in their child's education if they felt confident in the teacher's ability to ensure quality parental interactions and appropriate environmental support for their student with ASD. This information was pertinent because it illustrated the importance of fostering the collaborative relationship between educator and parent. The next section focused on vocabulary acquisition strategies.

Vocabulary Acquisition Strategies

Vocabulary Notebooks

Walters and Bozkurt (2009) conducted a study on vocabulary notebooks impact on vocabulary acquisition. The purpose of the study was to examine the effects of vocabulary notebooks on vocabulary acquisition for students in an English-as-a-foreign-language (EFL) classroom. The researchers were also interested in the opinions of both students and educators regarding the use of the vocabulary notebooks. The researchers addressed two questions in the study. 1) Did vocabulary notebook affect students' receptive, controlled productive and free productive vocabulary acquisition? 2) What opinions did the students and educators hold regarding the use of the notebooks? The dependent variables measured in the study were the receptive, controlled productive and free productive vocabulary acquisition. Vocabulary notebooks functioned as the independent variable in the study. The researchers did not explicitly state a hypothesis.

The researchers selected participants from the Zonguldak Karaelmas University English Language Preparatory School in Zonguldak, Turkey. The researchers selected 60 students and their teachers from 3 low to intermediate level classrooms. Two of the classrooms functioned as control groups. The first classroom contained 13 male and 7 female students. The second classroom contained ten male and ten female students. The third classroom functioned as the treatment group due to the educator's agreement to implement the vocabulary notebooks to supplement instruction. The treatment group had 12 male and 8 female students. The student participants were between the ages of 17 to 20 years. The researcher did not explicitly state additional demographic data on the participants.

The researchers asked the teacher from the treatment group to supplement daily instruction with the vocabulary notebooks for a period of four weeks at a rate of 20 words per

week while the two instructors from the control groups were not to modify the daily instruction. The study measured 80 low frequency, vocabulary words chosen from four unit textbooks, 20 of which also appear on the Academic Word List (AWL). In the treatment group, the educator was to provide students with daily attributes of some words such as the Turkish translation, part of speech, and English synonyms, antonyms, origins, and juxtapositions during instructional time. In addition, educators gave students class time to use the vocabulary notebooks to collaborate with one another.

Educators from the three classrooms gave pretests and posttests measuring students' receptive and controlled productive vocabulary. To measure the receptive vocabulary, students were required to match vocabulary words to their definitions. To measure the controlled productive vocabulary, students were required to complete a word used in context that was missing all but two letters. The tests contained the same words for each section. The tests included 50 words, 29 words from the vocabulary notebook activities and 21 words not included in the notebooks. To measure students' free productive vocabulary acquisition, students were required to produce a composition related to a given topic each week. The researchers evaluated these compositions according to frequency of correct target vocabulary usage.

Following the four-week period, the researchers interviewed the students and educators from the treatment group to collect their opinions regarding the use of the vocabulary notebooks. The researchers conducted separate interviews in English with educators and interviews in Turkish with students in individual groups of five. The researchers did not conduct interviews with individuals from the control groups.

The researchers found a significant difference in the receptive vocabulary acquisition results between the treatment group and the control groups (target words, $F(2, 57) = 3.401$, $p <$

.04, non-target words F (2, 57) = 10.014, $p < .000$). There was not a significant difference in results between the control groups. The treatment group had significant gains in target words (F (2, 57) = 59.033, $p < .000$) but not significant gains in non-target words (F (2, 57) = 1.140, $p < .327$). Therefore, the results indicated vocabulary notebooks had a significant effect on receptive vocabulary acquisition of target words when compared to receptive vocabulary acquisition of non-target words and the control groups.

The researchers found a significant difference in the controlled productive vocabulary acquisition results between the treatment group and the control groups in target words (F (2, 57) = 71.76, p < .000) but not significant gains in non-target words (F (2, 57) = 2.58, p < .085). Therefore, the results indicated vocabulary notebooks had a significant effect on controlled productive vocabulary acquisition of target words when compared to controlled productive vocabulary acquisition of the non-target words and the control groups.

The researchers found about half of the students in the treatment groups used target words throughout the weekly compositions and used target words from previous weeks in the week three and week four compositions. The results showed vocabulary notebooks influenced free productive vocabulary acquisition when compared to the near absence of free productive vocabulary acquisition of the control groups.

The responses from the interviews indicated students had positive opinions about the use and the benefits of vocabulary notebooks in class but felt that the use of the notebooks would not continue without the teacher requiring the continued implementation. In addition, the responses from the interviews indicated educators had positive opinions about the use and benefits of vocabulary notebooks but had concerns about the time required to utilize the tool effectively.

Walters and Bozkurt (2009) concluded that vocabulary notebooks were an effective tool to increase vocabulary acquisition, and students and educators had positive feelings concerning the notebooks. The researchers noted that vocabulary notebooks require a lot of time to implement which could be of concern.

The findings supported the idea that the implementation of vocabulary strategies was effective in furthering vocabulary acquisition. Students should have assessed various facets of each vocabulary word and engaged in different activities to encourage vocabulary acquisition. Additionally, Wei and Attan (2014) provided alternative strategies, including Rote-Copying and Read-Plus, which students utilized to increase vocabulary acquisition.

Rote-Copying or Read-Plus

Wei and Attan (2014) conducted a study to explore the effects of Rote-Copying and Read-Plus strategies on vocabulary acquisition. The purpose of the study was to compare students' vocabulary acquisition following the use of the Rote-Copying and Read-Plus strategies. Wei and Attan (2014) addressed two research questions. 1) What effects did the Rote-Copying and Read-Plus strategies have on student vocabulary acquisition? 2) What opinions did students have regarding the Rote-Copying and Read-Plus strategies? Vocabulary acquisition functioned as the dependent variable in the study, and the Rote-Copying and Read-Plus strategies functioned as the independent variables. The researchers did not explicitly state a hypothesis.

The participants included 35 students with limited understanding of English from a languishing Malaysian secondary school in Pahang. Of the student participants, 32 were from a national primary school and three were from a Chinese national primary school. The researchers did not explicitly state additional demographic data on the participants.

The study began with a pretest consisting of 39 questions to determine the students' performance when measured against the 1,000-word level. Two weeks following the pretest, the researchers implemented the Rote-Copying strategy for a week followed by a week of Read-Plus implementation. During the Rote-Copying week, students had to read a text that highlighted the target vocabulary words. The educator defined the words in the students' primary language, Malay and Mandarin. The students then had an activity with the target words written into an English sentence with a translation of the word in either Malay or Mandarin paired with it. The students were required to copy the English sentences twice. During the Read-Plus week, students had to read a text aligned to the syllabus that highlighted the target vocabulary words. The educator defined the words and provided students with an activity to complete comprised of three sections. In the first section, students were required to match target vocabulary words with their appropriate definition. In the second section, students were required to complete fill-in-the-blank sentences using the target vocabulary words. In the final section, students had the vocabulary words written in either Malay or Mandarin and were required to translate the words into English. The teacher noted incorrect responses, and the students were requires to make corrections as needed. The researchers conducted the posttest one week following the Read-Plus implementation. The researchers also selected 12 random participants to complete a three-question survey to determine participants' strategy preference and perceptions regarding the benefits of the strategies.

The results of the Rote-Copying strategy ($M = 5.29$) was 0.17 points lower than the results of the Read-Plus strategy ($M = 5.46$). Based on results, with a t-value of 0.642, researchers concluded that there was not a significant difference in the Rote-Copying and Read-

Plus strategies at a significance level of $p < 0.05$. Therefore, neither vocabulary acquisition strategy was more effective than the other was.

The results of the pretest (M = 4.49) and posttest (M = 5.29) of the Rote-Copying strategy showed a difference of 0.08. The results of the pretest (M = 4.40) and posttest (M = 5.46) of the Read-Plus strategy showed a difference of 1.06. Therefore, the Read-Plus strategy produced a higher level of improvement than the Rote-Copying strategy.

Responses from the interview indicated that 58.33% of students preferred the Read-Plus strategy to the Rote-Copying strategy. Students felt the Read-Plus strategy was more engaging while the Rote-Copying strategy was monotonous.

Wei and Attan (2014) concluded that both strategies increased vocabulary acquisition and one was not significantly better than the other was. Therefore, by offering students the option to select their preference when working, students were encouraged to take control of learning techniques best suited for them and foster independent learning techniques.

The findings from Wei and Attan (2014) again supported the idea that the implementation of vocabulary strategies was effective in furthering vocabulary acquisition. Educators provided students with various vocabulary acquisition strategies and encouraged students to select the one that complimented their own learning style thereby respecting and supporting the fact that each student processed information in their own way. The next study by Howrey and Quinn (2014) focused on the effectiveness of online versus print strategies in the acquisition of target vocabulary words.

Moodle or Print

Howrey and Quinn (2014) conducted a study to explore student preference on and success of online Moodle versus print resources. The purpose of the study was to improve both receptive and productive vocabulary acquisition of students with English as a second language. Acquisition of second language vocabulary functioned as the dependent variable, and the Moodle and print materials functioned as the independent variables. The researchers did not explicitly state research questions or a hypothesis.

Participants for the study included 35 freshmen English majors at a private university in Japan. Participants were in a first year English reading course, which met once a week for 90-minute sessions. Classes enrolled based on student ability and ranged from high intermediate level to low intermediate level. Researchers chose participants for this study from a sample of students demonstrating average academic performance. The researchers did not explicitly state additional demographic data on the participants.

Researchers randomly assigned participants to one of two groups, print or Moodle activities. The study consisted of a pretest and posttest for each semester. The first semester pretest and posttest consisted of fill-in-the-blank sentences and definition matching activities. The second semester pretest and posttest consisted of fill-in-the-blank and word form chart completion activities. Researchers utilized sub-lists six through eight of the Academic Word List (AWL) to select target words. First semester words came from the sixth through seventh sub-lists of the AWL. Second semester words came from the eighth sub-list of the AWL.

During the first semester, students in the print group had 60 target words to learn, given at a rate of 20 words every three weeks. The first week of the introduction of 20 target words, students utilized flash cards to assist them in the acquisition of the vocabulary. Flash cards needed to list target word definitions in English and Japanese, appropriate parts of speech, and

juxtapositions. Students were to complete fill-in-the-blank sentences and definition matching for the vocabulary words. At the beginning of each class period, students were required to share their flash cards with their peers and quiz one another for a five-minute period. Homework assignments consisted of definition matching activities. The second week, students were required to complete an assessment measuring definition matching from a choice of four options, fill-in-the-blank sentence completion, and parts of speech and juxtaposition chart completion. The third week, students were again required to complete a fill-in-the-blank assessment to be graded. During the three weeks, students occasionally engaged in games meant to increase their vocabulary acquisition and spelling by identifying parts of speech for each target word. Students needed to complete a midterm and final exam assessing the target words.

Students utilized workbooks instead of flash cards through the course of the second semester beginning on the first day. The workbook consisted of 12 sections, each introducing five words. The workbooks again included definition matching and parts of speech chart completion. Additionally, the workbooks included fill-in-the-juxtaposition activities and mistake correction. Students were required to complete three pages of the workbook each week for homework. Educators provided students with fifteen minutes to correct their workbook activities in either small groups or one on one instruction. Occasionally, educators provided students with additional juxtapositions or sentence examples. Again, students needed to complete a midterm and final exam assessing the target words. During the first semester, students in the online Moodle group were responsible for the completion of definition matching, fill-in-the-blank, and word form exercises. The first activity involved English definition instruction. Students were required to match words to all of their possible definitions. Assessments included all possible definitions and significant meaning changing forms of each target word. The next activity

involved word form. Students were required to know the root of the target word and all of its variations, especially if a prefix or suffix added to the word resulted in an opposite definition. The final activity involved fill-in-the-blank exercises. Moodle provided students with a word bank of scrambled target words. Students were required to unscramble the words and use the correct form of each word to complete sentences. Students needed to complete two assessments during the course of the semester and a final exam to assess the target words. Students utilized the same workbooks as the print group through the course of the second semester beginning on the first day. Students were required to download a pdf copy of the workbook. Educators allowed students to complete the workbook offline, but students were required to check their answers online instead of in the classroom. Students could only seek assistance in the classroom when confronted with technical issues. Students needed to complete two assessments during the course of the semester.

At the conclusion of the study, Howrey and Quinn (2014) distributed a survey to collect student opinions on difficulty and usefulness of materials, preference, and thoughts on continued usage of materials. Researchers scored these items on a Likert-scale. Researchers also provided questions asking students to express opinions pertaining to their likes or dislikes of the materials, thoughts on potential improvements, and concerns regarding time expended on utilizing the materials.

Howrey and Quinn (2014) found the mean of the first semester, paper-based posttest (M = 75.00) was 57.00 points higher than the pretest (M = 18.00). The mean of the first semester, Moodle-based posttest (M = 69.00) was 52.00 points higher than the pretest (M = 17.00). Researchers measured receptive knowledge and found the mean of the definition matching section of the first semester, paper-based posttest (M = 92.00) was 63.00 points higher than the

pretest (M = 29.00). The mean of the definition matching section of the first semester, Moodle-based posttest (M = 79.00) was 56.00 points higher than the pretest (M = 23.00). Researchers measured productive knowledge and found the mean of the sentence completion section of the first semester, paper-based posttest (M = 59.00) was 52.00 points higher than the pretest (M = 7.00). The mean of the sentence completion section of the first semester, Moodle-based posttest (M = 58.00) was 46.00 points higher than the pretest (M = 12.00). Scores in the paper-based group exceeded scores in the Moodle-based group, although both groups demonstrated improvement from the pretest to the posttest.

Howrey and Quinn (2014) found the mean of the second semester, paper-based posttest (M = 78.00) was 44.00 points higher than the pretest (M = 34.00). The mean of the second semester, Moodle-based posttest (M = 72.00) was 38.00 points higher than the pretest (M = 34.00). The mean of the word chart section of the second semester, paper-based posttest (M = 86.00) was 44.00 points higher than the pretest (M = 42.00). The mean of the word chart section of the second semester, Moodle-based posttest (M = 79.00) was 45.00 points higher than the pretest (M = 42.00). The mean of the sentence completion section of the second semester, paper-based posttest (M = 69.00) was 45.00 points higher than the pretest (M = 24.00). The mean of the sentence completion section of the second semester, Moodle-based posttest (M = 63.00) was 40.00 points higher than the pretest (M = 23.00). Scores in the paper-based group again surpassed scores in the Moodle-based group, although both groups again demonstrated improvement from the pretest to the posttest.

Howrey and Quinn (2014) found participants in the print-based group rated the workbooks as more beneficial (M = 4.47, SD = 0.51) than the vocabulary cards (M = 3.40, SD = 1.00). Students therefore preferred the workbooks to the vocabulary cards. Participants rated

vocabulary activities, such as juxtaposition practice (M= 4.4, SD = 0.50), definition matching (M = 4.17, SD = 0.95), cloze sentence completion (M = 4.17, SD = 0.63), word form charting (M = 3.94, SD = 1.02), and error correction (M = 3.47, SD = 0.94), according to perceived effectiveness. Participants perceived the juxtaposition practice as the most useful activity in acquiring vocabulary.

Researchers also had participants rate overall experience and opinions of the activities. Participants rated the activities as more challenging (M = 77.14), 12 from the paper group and 15 from the Moodle group, than appropriate (M = 8.57), one from the paper group and two from the Moodle group. Participants rated the amount of activities as more appropriate (M = 17.14), four from the paper group and two from the Moodle group, than excessive (M = 8.57), no participants from the paper group and three from the Moodle group. Participants rated the materials as more beneficial (M = 34.29), eight from the paper group and four from the Moodle group, than inconsistent (M = 14.29), one from the paper group and four from the Moodle group. Participants rated the complete experience as more positive (M = 45.71), eight from the paper group and eight from the Moodle group, than negative (M = 0.00), no participants from the paper or Moodle groups.

Howrey and Quinn (2014) concluded both print and online Moodle materials successfully improved both receptive and productive vocabulary. The researchers also found that providing students with additional time in class to reinforce vocabulary was the most successful approach to achieve vocabulary acquisition. Teacher and peer exercises in class encouraged students to keep pace with the activities in the print group whereas the independent exercises in the online Moodle method did not. Finally, researchers' data indicated that as the AWL Activities Levels progressed, participants engaged in less time in the Moodle activities online and recorded fewer

attempts at online quizzes. Researchers noted that this might be in part due to the participants perceiving the downloadable PDF, available as the levels increased, more convenient than the online activities. Therefore, researchers concluded that students preferred the convenience and familiarity of the print materials to the Moodle materials; this outcome was unanticipated due to the global exposure of technology.

The findings from Howrey and Quinn (2014) supported the idea that multiple techniques and materials designed to increase student vocabulary acquisition were effective. Although students increased knowledge of target vocabulary using both technology and print materials, the dedication of time and assistance from educators was the most significant influence on vocabulary acquisition. The next study by Orawiwatnakul (2011) focused on the effectiveness of analyzing word structures and context clues to increase vocabulary acquisition.

Analysis of Word Structures and Context Clues

Orawiwatnakul (2011) conducted a study to understand how various educational techniques influenced vocabulary acquisition. The purpose of the study was to assess how specific vocabulary acquisition techniques would enhance vocabulary performance for English language learners. The researcher addressed two research questions. 1) What impact did the vocabulary acquisition techniques have on the improved vocabulary ability of the students? 2) What opinions did the students have regarding the vocabulary acquisition techniques? Orawiwatnakul (2011) hypothesized that implementing multiple techniques at the same time to increase vocabulary acquisition was more effective than using only a single technique. The researcher did not explicitly state a null hypothesis. The vocabulary acquisition techniques served as the independent variables in the study. The opinions of the students regarding the

vocabulary acquisition techniques and the student vocabulary ability served as the dependent variables.

Orawiwatnakul (2011) selected 35 freshman students from 1 or 120 English 111 course sessions at Bangkok University. The English 111 course was a three-credit course required for students attending the facility. The researcher conducted the study during the first semester of the 2010 instructional year. English was not a primary language for the participants. The researcher did not explicitly state additional demographic data on the participants.

Orawiwatnakul (2011) conducted the study using vocabulary acquisition strategies, a pretest, a posttest, and a questionnaire. The study commenced with a pretest. The pretest was a 50-question assessment in multiple-choice format that measured student vocabulary ability completed within a 30-minute period. The pretest contained questions relating to word structure and comprehension in context. The questions that assessed comprehension in context did so using definitions, examples, compare/contrasts, synonyms, and reiterations. Following the pretest, the researcher separated students into three groups according to skill. The high group scored greater than 29.71 points, the intermediate group scored between 17.34 and 29.71 points, and the low group scored less than 17.34 points. The following 10 weeks, students participated in various vocabulary acquisition techniques. The vocabulary acquisition techniques required students to study each aspect of the word assessed in the pretest using word structure and context clue examination. In the word structure analysis, students were required to break each target word into smaller parts such as compound words, prefixes, suffixes, and root words to ascertain meaning and elocution. In the analysis with context clues, students were required to review definitions, examples, compare/contrasts, synonyms, and reiterations. The researcher provided students with thorough instruction and assigned students in-class activities related to the use of

word structure and context clue to increase vocabulary acquisition. Following the 10-week period, students completed the posttest, which was identical to the pretest, and completed a questionnaire regarding their opinions on the techniques and their benefits. The researcher did not explicitly provide additional data related to the vocabulary acquisition techniques or the questionnaire.

Orawiwatnakul (2011) found the mean of the posttest (M = 32.91) was 11.00 points higher than the mean of the pretest (M = 21.91). The standard deviations of the posttest (SD2 = 8.09) is greater than the standard deviation for the pretest (SD1 = 7.80). This demonstrates that there is a wider distribution of scores in the posttest. Researchers ran a two-tailed dependent t-test to determine if there was significant improvement in the pre-test and post-test means. Based on results, with a t-test *p*-value of 0.000, it can be concluded that there is a significant improvement in the pretest and posttest means at a significance level of $p<.01$.

Researchers also analyzed data by group ability to determine the effectiveness of the activities per functional level. Orawiwatnakul (2011) found the mean of the high group's posttest (M = 41.33) was 5.66 points higher than the mean of the pretest (M = 35.67). Researchers ran a two-tailed dependent t-test to determine if there was significant improvement in the pre-test and post-test means. Based on results, with a t-test *p*-value of 0.001, it can be concluded that there is a significant improvement in the pretest and posttest means at a significance level of $p<.01$.

Orawiwatnakul (2011) found the mean of the intermediate group's posttest (M = 34.00) was 11.82 points higher than the mean of the pretest (M = 22.18). Researchers ran a two-tailed dependent t-test to determine if there was significant improvement in the pre-test and post-test

means. Based on results, with a t-test *p*-value of 0.000, it can be concluded that there is a significant improvement in the pretest and posttest means at a significance level of $p<.001$.

Orawiwatnakul (2011) found the mean of the low group's posttest (M = 27.17) was 12.50 points higher than the mean of the pretest (M = 14.67). Researchers ran a two-tailed dependent t-test to determine if there was significant improvement in the pre-test and post-test means. Based on results, with a t-test *p*-value of 0.000, it can be concluded that there is a significant improvement in the pretest and posttest means at a significance level of $p<.001$.

Orawiwatnakul (2011) also found participants had positive attitudes towards format and content (M = 3.98, SD = .34), activities (M = 3.99, SD = .40), and benefits (M = 4.10, SD = .40). Overall, researchers recorded positive participant attitudes (M = 4.03, SD = .30). Students indicated positive attitudes towards all facets of the vocabulary acquisition techniques presented in the study, especially the benefits.

Orawiwatnakul (2011) concluded that the vocabulary acquisition techniques proved effective in the improvement of vocabulary ability of students. The difference between the pretest and the posttest scores was statistically significant. Students functioning in the low group demonstrated larger gains in vocabulary acquisition than students functioning in the high group did. The researcher indicated that to focus on a single method of vocabulary acquisition was redundant and varied techniques increased engagement. The researcher also concluded that the use of the vocabulary techniques were helpful in decreasing the difficulty students faced when reading academic texts.

This study supported the idea that multiple vocabulary acquisition techniques were an effective means to increase the procurement of target vocabulary words. Students found the

most success and engagement in vocabulary acquisition when assessing both the word structure and context clues of each target word. The next study by Dada and Alant (2009) focused on methods to increase vocabulary acquisition in a population with limited or no functional speech by means of an aided language simulation strategy.

Aided Language Stimulation

Dada and Alant (2009) conducted a single subject, multi-probe study to determine the effectiveness of an aided language simulation program on individuals with limited or no functional speech. The purpose of the study was to develop an aided language stimulation program, describe the complexion and frequency of the program, and implement it over the course of three weeks with four children exhibiting little or no functional speech to measure success rates. Accurate vocabulary recall when prompted with verbal stimuli functioned as the dependent variable. The aided vocabulary stimulation program provided over five sessions functioned as the independent variable. The researchers did not explicitly state research questions or a hypothesis.

Participants for the study included four children enrolled in second grade. Participants had attended school for a period of four to five years. Criteria required participants be between 8 to 12 years of age. Three of the participants were female; one was male. Three participants had a diagnosis of Cerebral Palsy; one had a diagnosis of Down syndrome. Participants attended a school for individuals with cognitive deficits. Three of the participants resided at the school following lessons; one did not remain at school following lessons. Three participants had a native language of Sepedi; one had a native language of Zulu. Criteria required participants to pass a hearing screener; participants enrolled in the study achieved a score of 18 out of 20 or better on the hearing screener. Three participants had right hemiplegia; two had upper

extremities more affected, one had lower extremities more affected. One participant was physically healthy with diminished gross and fine motor skills. Criteria required that all participants retained the ability to make independent selections. Three participants demonstrated the ability to engage in activities related to eating, dressing, and walking independently; one demonstrated the ability to engage in eating and walking independently but required assistance in fine motor activities related to dressing. Criteria required participants be classified as having less than 15 intelligible words by the school's speech and language pathologist. Two participants had speech patterns intelligible to individuals close to the participant but unintelligible to those unfamiliar with the participant. One participant had speech patterns unintelligible to individuals both close and unfamiliar to the participant. Participants had not previous engaged in communication interventions. Criteria required participants to be unfamiliar with the target vocabulary words, which parents and instructors assessed on three separate days using an informal assessment. The researchers did not explicitly state additional demographic data on the participants.

Dada and Alant (2009) conducted all experimental measures in a small white room with a communication board, a small table, and five small chairs within the school to control for potential auditory or visual distractions. Participants received intervention in a group setting each morning for 15 to 25 minute periods. The study began with three pre-assessments; researchers administered the Peabody Picture Vocabulary test, the Reynell Expressive Scale, and the Reynell Receptive Scale. Participant scores on the Peabody Picture Vocabulary Test-Revised ranged from 10 to 20. Participant scores on the Reynell Expressive Scale ranged from nine to 15, while scores on the Reynell Receptive Scale ranged from 31 to 40. Researchers then collected baseline data from the participants on the same 24 vocabulary target words, including 3

nouns and 21 adjectives. Researchers chose vocabulary words based on two criteria, presence on composite vocabulary lists and potential for interactive use during activities. The probes researchers utilized to collect baseline data were the same as the probes used to measure growth during the intervention and measure vocabulary acquisition at the conclusion of the study. Participants were administered the probes independently. Researchers collected data on Monday, Wednesday, and Friday of each of the three weeks during the course of the intervention. The probes required participants to match the spoken target word to one of five items to assess participant comprehension of the concept of each target word. Target words included concepts such as more, less, same, different. Researchers would present participants with five items and ask questions such as "which item is the same?" The intervention required researchers to display a symbol on a communication board and provide limited spoken language stimulation concurrently. Spoken stimulation did not include the use of communication devices as participates did not have a history with communication devices. Three activities occurred during the study at the rate of one activity per week; activities included arts and crafts, food preparation, and story time. During the arts and crafts activity, participants collaborated to create a picture of a sheep. During the food preparation activity, participants collaborated to make pudding. During the story time activity, participants created a story line for the story Goldilocks and the Three Bears. During each activity, communication boards were developed. Communication boards had 16 permanent symbols secured to the board and eight vocabulary symbols that attached to the board as each activity progressed. Exposure to vocabulary words occurred at a rate of three to five times per session.

Dada and Alant (2009) videotaped all sessions to later transcribe and analyze the effectiveness of the intervention. Researchers assessed three measures to determine the precision

of the intervention. Researchers measured the frequency of the intervention by dividing the number of times the intervention was used by the number of opportunities the intervention could have been used and multiplying by 100. Researchers measured the nature of the intervention by developing a statement to question ratio. Researchers measured the total number of occurrences in which the individual administering the intervention paired a vocabulary word with a symbol from the communication board in each session.

Dada and Alant (2009) found the aided language simulation program had a minimal increase in frequency across activities. The arts and crafts activity frequency at the end of the five sessions (M = 87.00), two scored 7/8 and two scored 8/8, was 11.00 points higher than the frequency at the first session (M = 76.00), three scored 0/8 and one scored 1/8. The food preparation activity frequency at the end of the five sessions (M = 92.00), three scored 7/8 and one scored 8/8, was 7.00 points higher than the frequency at the first session (M = 85.00), all four scored 1/8. The story time activity frequency at the end of week three (M = 93.00), all four scored 7/8, was 8.00 points higher than the frequency at the first session (M = 85.00), three scored 1/8 and one scored 2/8.

Researchers found performance across activities increased at the end of the five sessions. The mean of the post intervention scores for the arts and crafts activities (M = 7.50) was 7.25 points higher than the baseline scores (M = 0.25). The mean of the post intervention scores for the food preparation activities (M = 7.25) was 6.25 points higher than the baseline scores (M = 1.00). The mean of the week three implementation scores for the story time activities (M = 7.00) was 5.75 points higher than the baseline scores (M = 1.25). Researchers did not collect post intervention scores for the story time activity.

Dada and Alant (2009) concluded that further research is necessary to determine the appropriate frequency rate to implement. The researchers concluded that further clarification needed to occur to determine if the vocabulary acquisition was due to comprehension of the vocabulary or understanding of the paired symbols. Researchers also noted the repetition required for the storyboard activity supported the use of the intervention while the arts and crafts activity board was more challenging to use in conjunction with the intervention. Researchers acknowledged external influences might have had an impact on the results. Participants' limited opportunities and experiences potentially influenced lower scores. The ability of individuals with limited or no functional speech to fast map, or pair words with items in close proximity, potentially influenced higher scores. Dada and Alant (2009) concluded there is no definitive guarantee that the intervention was the cause of the participants' demonstrated vocabulary acquisition. Therefore, an intervention without the use of paired symbols might prove equally effective.

The findings from Dada and Alant (2009) supported the idea that visual aids or manipulatives were an effective means to increase vocabulary acquisition. Participants found the most success when researchers paired vocabulary instruction with a cue or a visual to help develop connections with target words. The next study by Moore and Calvert (2000) focused on the effectiveness of computer versus educator strategy implementation as it related to vocabulary acquisition for children with ASD.

Teacher or Computer Instruction

Moore and Calvert (2000) conducted a study to measure the effectiveness of computers on vocabulary acquisition for children with Autism Spectrum Disorder. The purpose for the study was to create a computer software program directed at children with autism, which

implemented behavioral learning principals known to increase success for the targeted population such as sound effects and action to increase engagement and retention. The researchers identified one research question. Researchers questioned the impact computers have on the vocabulary acquisition for young children with autism during a period when they are most likely to procure language skills. The researchers hypothesized that computer usage, rather than teacher led intervention, would yield beneficial results in attending, recall, and motivation when paired with visually captivating images for the vocabulary acquisition of children with autism. The researchers did not explicitly state a null hypothesis. The independent variables used in the study were the computer software program, which included captivating sounds and object movement to engage, motivate, and improve memory of participants, and a behavioral program similar to the computer program but without the visual and auditory stimuli. The dependent variables used in the study were acquisition of vocabulary, engagement, and motivation.

Participants included 14 children between the ages of 3 to 6 diagnosed with Autism Spectrum Disorder. The participants were comprised of 12 boys and 2 girls. Participants attended a school which sorted classes based on three levels of ability. The first group demonstrated some receptive vocabulary skills. The second group demonstrated the ability to speak and comprehend simple sentences. The third group demonstrated the ability to speak and comprehend complex sentences, although inconsistently. Within the teacher-led intervention group, all participants had previously engaged in behavioral intervention. Within the computer group, five out of seven participants had previously engaged in computer activities and were familiar with manipulating a pointing device. Researchers randomly assigned participants to one of two treatment groups implementing either computer software or teacher-led intervention. The researchers did not explicitly state additional demographic data on the participants.

Participants received initial instruction in following the commands “sit” and “look at” for 10 minutes per day on average for 5 days. Participants were required to sit in a chair and look at the teacher when prompted. Once participants successfully attended for 10 consecutive minutes, researchers randomly assigned participants to the teacher-led intervention group or the computer group. Moore and Calvert (2000) assigned the teacher-led intervention group a task requiring participants to respond to commands to touch or hand a named object to the researcher. If participants were successful, researchers provided verbal praise or allowed participants to play with a wanted item for an average of 7.41 seconds. If participants were not successful in responding, researchers continued to provide prompts until participants correctly responded. Researchers defined mastery as the ability to respond to a command accurately three times simultaneously without additional prompting. The computer group mirrored the teacher-led intervention group’s task, but when students responded appropriately, the computer provided reinforcement such as colors, songs, exciting sounds, and animations. When participants achieved mastery, the computer provided eight seconds of visual and auditory stimulation.

Moore and Calvert (2000) measured learning by administering a pretest and a posttest, administered one week following the pretest, consisting of 6 out of 18 target words utilizing flashcards. The target words were both common and uncommon nouns. Researchers presented participants with two flashcards to identify the requested target word in three consecutive opportunities. Researchers measured attention by videotaping participants and later recording the number of “on” and “off” looks. For participants in the teacher-led intervention group, researchers defined “on” looks as duration of time participants looked at the instructor or the instructional materials and “off” looks as duration of time participants looked away from instructor or instructional materials. For participants in the computer group, researchers defined

"on" looks as duration of time participants looked at the computer and "off" looks as duration of time participants looked away from the computer. Moore and Calvert (2000) measured motivation by asking participants if they wanted to continue with the intervention or play at the end of the final session. Participants indicated their choices to continue the intervention or play verbally or by gesturing. Participants also indicated their choice to play by leaving the table. Participants that continued the intervention scored as motivated; individuals that chose to play scored as less motivated.

Moore and Calvert (2000) conducted a one-way ANOVA to determine the effectiveness of computer versus teacher-led groups on attentiveness. The mean of the computer group (M = 97.00) was 35.00 points higher than the teacher-led group (M = 62.00). The difference was statistically significant ($F(1, 13) = 13.28$, $p < .01$). Participants demonstrated higher attention levels in the computer group rather than the teacher-led group.

Researchers conducted a one-way ANOVA to determine the effectiveness of computer versus teacher-led groups on recall of nouns. The mean score of the computer group (M = 74.00) was 33.00 points higher than the teacher-led group (M = 41.00). The difference was statistically significant ($F(1, 13) = 10.89$, $p < .01$). Participants demonstrated higher recall of nouns in the computer group rather than the teacher-led group.

Researchers conducted a chi-square analysis to determine the effectiveness of computer versus teacher-led groups on participant motivation. The difference between participants that chose to continue the intervention in the computer versus the teacher-led groups was statistically significant ($\chi^2_{(1)} = 3.818$, $p < .05$). The mean of the computer group (M = 57.00) was 57.00 points higher than the teacher-led group (M = 0.00).

Researchers conducted a regression analysis to measure the relationship between participant attentiveness and participant recall in both groups. The results were statistically significant ($F(1, 13) = 38.45$, $p < .01$) for both groups. The more attentive the participants were, the more nouns participants recalled.

Moore and Calvert (2000) concluded the use of computer technology to supplement teacher-led instruction is a valuable, cost-effective strategy in increasing vocabulary acquisition for students with autism. Researchers concluded that software that provided visually and auditory stimulation to students was effective in engaging, motivating and stimulating vocabulary acquisition. Computers have a significant impact on the vocabulary acquisition, engagement, and motivation of young children with autism during a period when they are most likely to procure language skills. Researchers highlighted the relationship between attentiveness and recall as it demonstrated the importance of keeping students with autism visually engaged during instruction to increase retention. Researchers acknowledged the small sample size as a limitation to the study, and encouraged further exploration with a larger sample size.

The findings from Moore and Calvert (2000) supported the idea that engaging resources outside of teach-led instruction was effective in furthering vocabulary acquisition. Students found access to activities outside of classroom instruction increased attention and motivation to instructional tasks as well as enhanced vocabulary acquisition.

Conclusion

This chapter included a review of literature on parental involvement, vocabulary acquisition strategies, and the influence of each on children with Autism Spectrum Disorder (ASD). The impact of parental involvement on vocabulary acquisition for children with ASD

was questionable due to the unknown influence personal relationships had for individuals with ASD.

It was evident that parental involvement yielded positive results in academia for students without ASD. Overall, parental involvement in homework generated positive effects for students without ASD even with disconnect between parent and teacher methodology intermittently negating that impact (George & Mensah, 2010). Additional data indicated that the values parents encouraged in the home significantly influenced students' opinions toward their educational courses, and there was a strong relationship between parental involvement and the overall success of student academia (Adamski, Fraser, & Peiro, 2013).

The effects of parental involvement on academic success for children with ASD were less apparent, so researchers conducted studies to analyze the different areas that parental involvement significantly influenced children with ASD. A mother's outlook regarding a diagnosis of ASD for her child directly affected how that mother would parent her child. This was relevant because it illustrated how parental involvement influenced the nurturing of a child thereby shaping the future of that child based on experiences (Wachtel & Carter, 2008). Kelly, Garnett, Attwood, and Peterson (2008) provided data, which indicated that family impact delivered stronger predictors of ASD symptoms through indicators of anxiety/depression than peer impact. The relations within the family more significantly influenced children with ASD than the relations with individuals outside of the home, which illustrated that parental involvement was notable when considering ASD symptoms. Additionally, Boyd, McDonough, Rupp, Khan, and Bodfish (2011) provided data that indicated that a family implemented treatment method was effective in reducing classic maladaptive behaviors individuals with ASD demonstrated while increasing adaptive behaviors. When a family was engaged in treatment for a

child with ASD, the child was more likely to experience positive outcomes from the treatment. In order to increase parental involvement, it was important that individuals that worked with the child with ASD initiated communication with parents (Vacco, 2002). Parents were more likely to engage in activities if they felt individuals that worked with children with ASD were knowledgeable about ASD and were capable of providing appropriate supports for the children.

There was little research to illustrate how students with ASD perform in the area of vocabulary acquisition. Numerous studies have demonstrated the impact of various vocabulary acquisition strategies for populations with English as a second language. Vocabulary notebooks were one strategy utilized to increase vocabulary acquisition (Walters & Bozkurt, 2009). Vocabulary notebooks introduced various components of each target word such as translations, definitions, parts of speech, synonyms, antonyms, origins, and juxtapositions. Additional strategies found to be effective included Rote-Copying and Read-Plus methods (Wei & Attan, 2014). Rote-Copying required individuals to copy definitions in English twice, and although monotonous, the method proved to be effective. Read-Plus required individuals to match words with definitions and appropriate translations and complete fill-in-the-blank activities. Further studies revealed that by providing direct instruction in all facets of a word, such as structure, definition, synonyms, examples, and comparisons/contrasts between words, students demonstrated an increased ability and interest in vocabulary acquisition (Orawiwatnakul, 2011). When working with children with limited or no functional speech, aided language simulation using a communication board proved to be an effective strategy in vocabulary acquisition (Dada & Alant, 2009). Finally, a number of studies addressed the effectiveness of computer related strategies to increase vocabulary acquisition. Howrey and Quinn (2014) provided data indicating that strategies utilizing print materials were more effective in increased vocabulary acquisition

than strategies utilizing online materials in a classroom of students with English as a second language. However, Moore and Calvert (2000) provided data indicating that strategies utilizing computer programs were more effective in engaging the attention of students with ASD than strategies implemented by an educator. Computer programs provided students with ASD with more visual and auditory stimulation to keep engagement levels higher.

In conclusion, parental involvement had significant influences on children without disabilities in academic settings. Parental involvement also had significant effects on young children with ASD when assessing symptoms typically associated with ASD. Vocabulary acquisition strategies proved to be highly effective with populations of students with English as a second language. Strategies utilizing computer programs proved to be effective in increasing engagement in students with ASD. The effect of parental involvement in regards to academic success for students with ASD, specifically in the area of vocabulary acquisition, needed further study.

The following chapter focused on the procedures implemented during this researcher's study to assess the effects of parental involvement on vocabulary acquisition of male, middle school students with Autism Spectrum Disorder using both at-home and in-class activities.

Chapter III

PROCEDURES FOR THE STUDY

The researcher sought to discover the impact of parental involvement on the receptive and productive vocabulary acquisition of male, middle school students with Autism Spectrum Disorder. The intervention strategy included both classroom and home activities. Parental

feedback was collected and valued throughout the study, and parental responses were used to modify activities as needed.

The purpose of this study was to determine which strategies were the most effective both in the classroom and at home when related to vocabulary acquisition. Parents were provided with various activities to engage their participants in vocabulary acquisition through the course of the eight-week study. Parents were continually asked to provide feedback related to those activities. The feedback was used to determine which activities participants and parents found the most engaging and the most challenging. This chapter includes a description of the research site and sample population; in addition, to the strategies implemented through the eight-week study and the tools used to record data and parental feedback. The following section addressed the students and parents who participated in the study.

Participants

Participants were recruited for the study from a public school located in an urban setting in Milwaukee, Wisconsin, which offered classes from pre-kindergarten to eighth grade. The facility originated during the 2013-2014 school year. It was the combination of two schools into one instructional facility. In the 2014-2015 school year, enrollment numbers recorded 598 students without disabilities (78.6% of the school population) and 163 students with disabilities (21.4%). Of those individuals, the primary disabilities were recorded as follows: 55 students with autism (7.2%), 1 student with cognitive disability (0.1%), 6 students with emotional behavioral disability (0.8%), 43 students with other health impairment (5.7%), 10 students with significant developmental delay (1.3%), 24 students with specific learning disability (3.2%) and 24 students with speech or language impairment (3.2%). In the 2014-2015 school year, enrollment numbers also recorded 231 students as not economically disadvantaged (30.4%) and

530 students as economically disadvantaged (69.6%). In addition, the numbers indicated 731 students were English proficient (96.1%) and 30 students were English Language Learners (3.9%). Of the school population, 388 students were female (51.0%) and 373 students were male (49.0%). The student body was comprised of 27 American Indian students (3.5%), 43 Asian students (5.7%), 152 African American students (20.0%), 250 Hispanic students (32.9%), 1 Pacific Isle student (0.1%), 283 Caucasian students (37.2%), and 5 students of two or more races/ethnicities (0.7%). The numbers also indicated that 761 students were not migrants (100.0%).

Students were recruited from the middle school comprehensive autism unit within the facility. The unit was comprised of ten, English speaking, male students. Letters and permission slips were sent home to the parents of the ten students; five parents returned the permission slips and agreed to participate in the study.

Table 1: Description of Parent Participants

	Parent				
Criteria	A	B	C	D	E
Gender	Female	Female	Female	Female	Female
Ethnicity	Asian	Caucasian	Hispanic	Hispanic	Caucasian
Primary Language	English	English	Spanish	Spanish	English
Occupation	Elementary School Teacher	Chemistry Professor	Nurse, Professional Dancer	N/A	N/A

Table 2: Description of Student Participants

	Participant				
Criteria	A	B	C	D	E
Age	14 years 9 months	14 years 8 months	13 years 10 months	14 years 0 months	13 years 4 months
Grade	7th	8th	7th	8th	7th
Ethnicity	Asian	Caucasian	Hispanic	Hispanic	Caucasian
Primary Diagnosis	Autism	Fragile X Syndrome	Autism	Autism	Autism
Secondary Diagnoses	Speech and Language	Autism	N/A	N/A	Speech and Language, 47-XXY Syndrome

Participants A, B, D, and E demonstrated the ability to control a writing utensil independently. Participant C required the support of another person to hold his hand up during writing tasks while participant C moved the pencil independently.

Participant B was verbal. Participants A, D, and E exhibited significant speech delays and required the use of an augmented communication device. Participant C was non-verbal and required the use of an augmented communication device or a support person to hold his hand while he communicated through writing on paper or in the palm of another person's hand.

Prior to this study, participants received weekly spelling tests assessing their knowledge of 12 words. Assessments measured the proper spelling of the words. Participants were not required to know the word definitions. Participants would receive a word list at the beginning of each week and complete a related assessment at the end of the week. Parents did not receive instructions on how to prepare their student for the assessment at the end of the week. In-class activities related to the vocabulary words were infrequent and comprised of spelling the words out with a peer using an alphabet board. The following section addressed the instruments used to collect data through the course of the study.

Instruments Used in Data Collection

The demographic information used to gather descriptive data on the population of students at the school participants were selected from included information from the Wisconsin Department of Public Instruction's Information System for Education Data Dashboard website. The demographic information used to gather descriptive data on participants included information from observations and individualized education programs. The demographic information used to gather descriptive data on parents included information from one-on-one conversations with parents.

The information regarding on/off task behaviors during assessments was recorded by the researcher on a matrix (Appendix E). The researcher made record of the participant on/off task behavior during the administration of the assessment.

The tool used to gather pre and post assessment data measuring vocabulary acquisition was a test template (Appendix B). Participants were administered the spelling section of the test

template first. Upon completion of this assessment, participants exchanged the spelling section for the definition matching section.

Parental interview responses, conducted over the phone, were recorded by writing the responses down on paper. Parental questionnaires were distributed on paper, and parents were tasked with writing their responses down and returning the paper to the researcher. Parents had the freedom to choose the method they wanted to use to record and share video clips of their participants completing the vocabulary activities. The following section addressed the procedures implemented through the course of the eight-week study.

Procedures Used

The intervention strategy was implemented in the classroom in the mornings between 9:00am and 9:15am for 16 sessions, 8 Tuesday sessions and 8 Thursday sessions. Each week the researcher created a 17-word vocabulary list (Appendix A). Vocabulary words were selected from a fourth grade level spelling text. Researchers selected each word list from a new unit in the textbook. The textbook had a glossary in the back section; definitions for each vocabulary word came from the glossary. The pretest and posttest were administered from the weekly list, and participants took the list of words home to study for the week.

The first week, the definitions provided to the students on the word lists, assessments, and activities were taken verbatim from the spelling textbook. In addition, if a word had more than one meaning, all definitions for the word were included on the word lists, assessments, and activities. Week 2, definitions were modified to suit the cognitive functioning of the students. This included providing participants with one definition, the most common, for each word and simplifying words within the definition when able. This continued for Weeks 3, 4, and 5. Week

6, the word lists were modified to have all words and definitions begin with a lower case letter per parent request.

The pretests and posttests (Appendix B) were used to measure baseline data and vocabulary acquisition through the course of the study. Each test included two sections. The first section was a spelling section. The researcher said an item number, read the corresponding word aloud from the weekly list, used the word in a sentence, and read the word aloud a second time. Participants were responsible for writing the word in the appropriate blank. Once participants completed the spelling portion, they raised their hands, the spelling section was collected, and the definition matching section was distributed. The definition matching section was comprised of each vocabulary word written out and three definitions to choose from listed beneath it, with the matching definition being the modified definition from the weekly spelling list. The first week, participants were required to circle an A, B, or C option corresponding to the matching definitions. This process appeared too difficult for participants with fine motor control issues, and participants instead circled the entire definition. Responses became difficult to rate due to the large circle many participants used which encompassed multiple answers. The following weeks, participants were required to fill in a bubble for the matching definition. Participants found this process easier, and the researcher was able to rate the assessments more accurately. The first and second weeks, definitions were listed multiple times through the assessment, under the matching vocabulary word as well as under three to four other vocabulary words. The third week, each definition was listed one time, under the matching vocabulary word and the remaining two definitions for each question were selected from definitions listed in the back of the textbook, again each definition was modified to suit the cognitive functioning of each student.

Mondays

Classroom activities. The pretests were administered in the classroom at the beginning of each week between 9:00am and 9:15am for eight consecutive weeks. Participants received a 17-word vocabulary pretest, which included two bonus words, in class to establish baseline data. During the assessment, the researcher collected observation data for each participant indicating on/off task behavior. On-task behavior defined as attending to the assessment or the researcher by looking at the researcher or assessment, sitting quietly, or writing answers. Off-task behavior defined as participants looking away from the researcher or the assessment, talking during the assessment, or perseverating. If school was not in session on a Monday, pretests were administered on Tuesday, and the Tuesday in-class activity was moved to Wednesday. This timeline shift was required for Week 7 of the study.

Home activities. Participants went home Monday with a vocabulary word/definition list matching the pre-vocabulary assessment they took in class that day. Participants also brought home a letter for parents listing strategies to implement at home for ten minutes each night with their student from Monday through Thursday. If school was not in session on a Monday, parents were asked to combine the Monday vocabulary activities with the Tuesday vocabulary activities. This timeline shift was required for Week 7 of the study. Beginning on Monday, parents were asked to sit with their student and have them write each of the vocabulary words out three times on a piece of paper. Following this activity, parents and students were to read the vocabulary words and their definitions aloud together.

Tuesdays

Classroom activities. Participants completed a definition matching worksheet (Appendix C) in class between 9:00am and 9:15am for eight consecutive weeks. The definition matching worksheet was comprised of the same 17 definition questions listed in the pretest and posttest. The definition matching in-class activity was altered by providing participants with only the first two letters of each vocabulary word. In addition, questions were rearranged in a different order. Beginning Week 2, participants were provided with the 17 vocabulary words in a supplemental list to accompany the in-class activities. Vocabulary words were arranged in the same order as the word list provided at the beginning of the week but in a different order than the questions listed. Beginning Week 7, participants were provided with the supplemental word list and the questions within the activity in the same order as the word list provided at the beginning of the week. This activity was meant to focus participant attention on the definitions and provide practice writing out each vocabulary word; however, participants focused more attention on finding the word that would fit with the spelling from their supplemental list and did not purposefully select a matching definition. After the change in Week 7, participants' accuracy in the definition matching activity increased, therefore providing the additional practice originally intended. Once participants completed the worksheet, the researcher and participants engaged in a one on one discussion regarding each marked response. If it was apparent the participant did not read each item and did not make purposeful selections, the participant independently corrected the worksheet and had a second discussion with the researcher.

Home activities. Home activities for Tuesday required that parents sit with their student and have them write each of the vocabulary words out one time on a piece of paper, and again parents and students were to read the vocabulary words and their definitions aloud together. In addition, parents and students played a game together, sent home with the student following

Tuesday's class. The game was comprised of 17 words, taken from the vocabulary list, typed onto a sheet of paper. The words were cut into separate cards and then cut into two pieces, creating 34 game cards. The first piece had the first two letters of the word; the second piece had the remaining letters of the word. Parents and students mixed the word cards up into a pile. The game required students to find the two matching pieces to put the word back together.

Wednesdays

Classroom activities. Participants did not complete classroom activities.

Home activities. Home activities required that parents sit with their student and have them write each of the vocabulary words one time on a piece of paper, and again parents and students were to read the vocabulary words and their definitions aloud together. In addition, parents and students were to play a second game together, which was sent home with the student following Wednesday's class. The game was comprised of 17 words and the corresponding definitions, taken from the vocabulary list, typed on a sheet of paper. The words and definitions were cut into separate cards, creating 34 total game cards. Parents and students mixed the words and definitions up into a pile. The game required students to match each word with its definition. During Week 1, the definition matching game home was sent with participants on Thursday instead of Wednesday by error. The parents included the game in the Thursday activities. All other activities on Wednesday and Thursday of Week 1 remained the same.

Thursdays

Classroom activities. Participants completed a fill-in-the-blank worksheet (Appendix D) in class between 9:00am and 9:15am for eight consecutive weeks. The worksheet comprised of the 17 vocabulary words from the weekly list used in context. The researcher created each

sentence, using the vocabulary word in the context of the definition listed on the weekly list. The first two letters of the appropriate vocabulary word were provided at the beginning of the blank within each sentence. Sentences were arranged in a different order than indicated on the word list sent home at the beginning of the week. Beginning Week 2, participants were provided with the 17 vocabulary words in a supplemental list to accompany the in-class activities. Vocabulary words were arranged in the same order as the word list sent home at the beginning of the week but in a different order than the sentences listed. Once participants completed the worksheet, the researcher and participants engaged in a one on one discussion regarding each marked response. If it was apparent participant did not read each item and did not record purposeful selections, the participant independently corrected the worksheet and had a second discussion with the researcher.

Home activities. Home activities for Thursday required that parents quiz their student on all of the vocabulary words. Students were required to write misspelled words five times, and again parents and students were to read the vocabulary words and their definitions aloud together.

Fridays

Classroom activities. The posttests were administered in the classroom between 9:00am and 9:15am for eight consecutive weeks. Participants received a posttest, the same 17-word vocabulary assessment administered at the beginning of the week, in class to measure growth in vocabulary acquisition. During the assessment, the researcher collected observation data for each participant indicating on/off task behavior using the same criteria measured at the start of the week. School was in session every Friday through the course of the study, so not timeline modifications were required.

Home activities. Participants did not complete home activities.

Table 3: Participants' Classroom and Home Activities

Day of the Week	Classroom Activities	Home Activities
Monday	• Completed pre-vocabulary assessment	• Wrote each vocabulary word three times • Read words and their definitions aloud with parent.
Tuesday	• Completed a definition matching worksheet. Worksheet listed the first two letters of the vocabulary word. Completed the word and selected its definition from a list of three choices. o Example: ph____ o A device that transmits sound o An animal with feathers and a beak o A structure where children go to learn • Went through the worksheet one on one with researcher.	• Wrote each vocabulary word once • Read words and their definitions aloud with parent. • Played a game with parent in which each vocabulary word was broken up into two parts and participant had to find the two cards that correctly spelled each of the vocabulary words
Wednesday	N/A	• Wrote each vocabulary word once • Read words and their definitions aloud with parent • Played a matching game with parent in which participant had to match vocabulary words with definitions
Thursday	• Completed a fill-in-the-blank worksheet. For each empty blank, the	• Quizzed on all words by parent • Wrote misspelled words

	worksheet listed the first two letters of the vocabulary word. Needed to complete the word. ○ Example: The ph___ was ringing. • Went through the worksheet one on one with researcher.	five times • Read words and their definitions aloud with parent.
Friday	• Completed post-vocabulary assessment	N/A

The following section addressed the data collection techniques utilized during the course of the study.

Data Collection

Pretests/Posttests

To determine the effects of parental involvement on vocabulary acquisition of male middle school students with Autism Spectrum Disorder, analysis of pre and post vocabulary assessment were made. Participant performance on the spelling section and the definition matching section of each pre and post vocabulary assessment were recorded separately, in addition to recording a comprehensive score for each assessment.

Spelling section. Participants given the spelling section of the assessment were asked to record the proper spelling of each word after the researcher read the word aloud, used the word in a sentence, and repeated the word. Participants recorded answers with a writing utensil on the spelling test packet, which contained a series of 17 boxes with a number in each box, indicating the item number the group was on during the assessment. Participants were responsible for writing the voiced word in its appropriate box. The spelling section measured participants'

receptive vocabulary abilities, as well as the participants' ability to accurately write a word when prompted. Within the spelling section, participants only received credit for a word if participants spelled it correctly in the correct form. Participants did not receive credit for a word if they added an additional suffix or prefix to the word. For example, if the word was "jump", and the participant wrote "jumps", the item was marked incorrect.

Definition Matching Section. After turning in the spelling test pack, participants were asked to record the matching definition of each word on the assessment. Participants independently read and recorded answers with a writing utensil on the definition matching test packet, which contained a series of 17 words and three possible definitions. Each definition was paired with a bubble to be filled in once the appropriate definition was selected. The definition matching section measured the beginning stages of participants' productive vocabulary abilities. The researcher wanted to measure participant ability to see a word and understand what the word means when provided with multiple options. Within the definition matching section, participants only received credit if they indicated one response. If a participant indicated the correct response in addition to a second response and efforts to remove one of the responses was not evident, the item was marked incorrect. During Week 1, definition-matching responses were recorded based on the initial placement of a circle. For example, if students created a large circle around a definition, the researcher recorded the response as the place where the selection mark began. The following section addressed data collection for on/off task behavior during assessments.

On/Off Task Behavior

During the course of the assessment, researchers recorded on/off task behavior on a template. The on/off task behavior measured student engagement during the assessments. If students were engaged during both sections of the assessment, the researcher recorded a mark of

on task. If students were not attending to one or both sections of the assessment, the researcher recorded a mark of off task. This measure provided possible explanations for scores received during the assessment. If participants were off task during an assessment, it could provide a possible reason for a lower test score.

If participants demonstrated a change in on/off task behavior during the course of the assessment, the shift was noted. For example, if a participant was listening and recording responses during the spelling portion but began talking during the definition portion, the researcher made a note on the recording sheet that the participant was on task during the spelling portion but off task for the definition portion. The on/off task behavior mark for the comprehensive assessment was marked as off task in this instance. Participants only received an on task mark for the comprehensive assessment if participants exhibited on task behavior during both sections of the assessment. The following section addressed parent feedback collected during the course of the study.

Parent Feedback

In addition to classroom and home activities, the researcher also conducted interviews and supplied the parents of the participants with questionnaires to complete. Phone interviews with parents were conducted Week 1, Week 4, and Week 8. Questionnaires sent home with students for parents to complete Week 2, Week, 4, Week 6, and Week 8. Parents were asked to record videos of their participant and email the videos to the researcher through the course of the study if and, as they were able to. In addition, parents were encouraged to reach out throughout the study through email, hand written notes, face-to-face conversations, or phone calls with any additional feedback.

Phone Interviews. Phone interviews conducted at the beginning of the study to ensure parents understood the strategies. Interviews were conducted 4 weeks into the study to see what parents felt was working/not working at home and allow the researcher to make adjustments as needed. Interviews at the end of the study determined what parents felt worked best at home. Interviews took place over the phone during the evening hours unless parents indicated a different preference and all responses were recorded on the Parent Interview Record Sheet (Appendix F).

Week 1, parents were contacted to complete the first interview, which was recorded on the Parent Interview Record Sheet – Week 1.

Week 4, the researcher called the parents to conduct the second interview and recorded parent responses on the Parent Interview Record Sheet – Week 4.

At the conclusion of the eight-week study, the researcher called the parents to conduct the final interview and recorded parent responses on the Parent Interview Record Sheet – Week 8.

Parent questionnaires. Every two weeks through the course of the study, parents completed a questionnaire by hand explaining how the at-home instruction was progressing. The questionnaires included the same questions each week:

1. What you did first? How did your child respond to it?
2. What did you do next? How did your child respond to that?
3. What was the easiest part of the lesson instruction for you?
4. What was most challenging?

The parent questionnaire measured the at home progress and identified what steps parents were taking at home to determine how close parents were following to the outlined instructions.

In addition, the questionnaires noted how participants received the activities, identified areas of concern and success, and recorded changes exhibited as the study progressed. Parents were instructed to complete all questionnaires by hand. In the event that a parent did not return a questionnaire, additional copies of the questionnaires were sent home with participants throughout the week with reminder notes to parents to complete the questionnaires and return. In addition, emails were sent to parents with the questionnaire questions listed and a reminder to complete the questionnaire.

Video Clips. Video clips of the at-home activities made by parents allowed the researcher to analyze how parents and participants interacted during the activities. The video clips were an additional source of information regarding how closely parents followed the instructions sent home. In addition, the videos provided the researcher with further information on how participants received the activities, noting whether participants appeared distressed or engaged. The following section addressed relevant themes related to the procedures, which influenced the design of the study.

Conclusion

The study evolved through the course of the eight weeks. Small modifications were made in consideration of the population of participants. The researcher strived to keep activities engaging and challenging. Parents resisted the challenges at the beginning of the study fearing expectations were too high for their student. However, as the study progressed, parents accepted and welcomed the activities, and participants developed an understanding of the expectations and found success.

The following chapter focused on the results found during this researcher's study to assess the effects of parental involvement on vocabulary acquisition of male, middle school students with Autism Spectrum Disorder after using both at-home and in-class activities.

Chapter IV

RESULTS

The purpose of this research study was to determine the effects of increased parental involvement with male, middle school students with Autism Spectrum Disorder on growth in vocabulary ability. The researcher hypothesized that parental involvement would increase vocabulary acquisition of male, middle school students with ASD. Therefore, the null hypothesis stated that there would be no increase in vocabulary acquisition of male, middle school students with ASD. During the months of April, May, and June, students engaged in 15-minute strategies in class twice a week and 10-minute strategies at home four times a week for eight weeks. Strategies including rote copying of target words, word matching games, and word completion on classroom worksheets provided opportunities for students to enhance receptive vocabulary. Strategies including definition-matching worksheets, fill in the blank worksheets, definition matching games, and definition read-alouds with a parent provided opportunities for students to enhance beginning stages of productive vocabulary.

The result of the study were reported in six parts. The first section focused on demographic data. The second section focused on pretest and posttest assessment data collected each week and analyzed by comprehensive score, spelling section score, and definition matching section score. The third section focused on pretest and posttest assessment data collected from each student and analyzed by comprehensive score, spelling section score, and definition

matching section score. The fourth section analyzed the correlation between pretest and posttest scores and on-task and off-task behavior. The fifth section addressed parental feedback received, analyzing interviews, questionnaires, video clips, and additional feedback. The final section summarized each component of the chapter. The following section examines demographic data of participants.

Demographic Data

Initially, participants were reluctant to engage in the activities. Participants were upset with the pretests knowing they did not know the answers and were therefore unwilling to respond and get the questions wrong. Participants required a lot of prompting in the beginning weeks to continue trying the assessment. Towards the end of the study, participants were familiar with the requirements and many made conscience efforts to write words as they thought they should be spelling, moving on to the next item without issue. Initially, participants were also unwilling to expend the effort required to complete the definition matching and fill-in-the-blank worksheets to the best of their ability. Participants were more concerned with finding words that matched the first two letters of each word regardless of the context surrounding the word, either guessing on the definitions or ignoring the fill-in-the-blank sentences completely. Towards the end of the study, participants took the time to read each question in the classroom activities before providing a response with little or no prompting.

Participants were resistant to the change in the routine vocabulary activities the class was accustomed to prior to this study, but as the weeks progressed, they developed a new routine that appeared to be more preferential, and the information obtained through the weeks increased not only in the number of target words but also in the addition of definitions. The following section

addressed feedback provided by the parents of the participants through interviews, questionnaires, in-person demonstrations, video clips, and additional contact methods.

Parental Interview and Questionnaire Data

Data collected from parents were in the form of interviews, questionnaires, video clip, and in-person demonstrations. Parent B completed the Week 4 interview through email. Parent E completed the Week 1 interview through a face-to-face conversation with the researcher. Parent B completed Week 2 and Week 4 questionnaires through email. Parent B completed Week 8 questionnaire over the phone. Parent B did not complete a Week 6 questionnaire. Parent C did not complete Week 4 questionnaire. In addition to the questionnaires and interviews, Parent A provided seven hand written notes and two emails with additional feedback. Parent E provided two hand written notes with additional feedback. The following section addressed the interviews conducted with Parent A.

Parent A Interviews

During the Week 1 interview, Parent A voiced concerns over the number of words on the world list sent home each week and requested the word list be limited to ten words at the beginning while slowly adding words as the process went along. The researcher considered this suggestion but decided to keep the rate of vocabulary introduction at 17 words a week. The researcher intended to challenge the participants and had the opinion that an increase of five words from their previous spelling routine of 12 words a week was a reasonable expectation. In addition, Parent A had concerns over the choice of words. Parent A preferred words used more frequently and words of a more concrete nature, such as nouns. Parent A felt Participant A learned best when a word could be drawn out to provide a visualization. The researcher

considered this suggestion but decided to maintain the complexity of the vocabulary words as presented in the textbook. It was the opinion of the researcher that the participants would benefit from receiving abstract words in addition to concrete words because words encountered in society are more abstract in nature, particularly when engaging in conversations. Parent A also suggested including a picture word matching worksheet and a definition matching worksheet to the home activities would be beneficial.

During the Week 4 interview, Parent A noted that the activities were going well. Participant A responded best to the games and felt it was an activity that was effective. Parent A indicated she instructed Participant A to identify key words within a definition to aide him in the recall process. Parent A again noted the abstract words were a challenge, and Participant A preferred the concrete vocabulary he could visualize. Parent A suggested modifying the game to include pictures for future endeavors. It was the opinion of Parent A, the program was good and both she and Participant A enjoyed working on it and there were no parts of the program that were not working. Parent A noted it was during Week 4 that she began having Participant A underline key words within definitions and provide examples to target words; both techniques appeared to be very effective.

During the Week 8 interview, Parent A noted the most effective strategy presented in the study was the presentation of the games. Parent A used the list in conjunction with the games, so Participant A could match cards like a puzzle. Parent A indicated the least effective strategy was defining and finding meaning for the abstract words as this was a frustration for Participant A. The following section addressed the interviews conducted with Parent B.

Parent B Interviews

During the Week 1 interview, Parent B indicated that during the games Parent B casually presented Participant B with eight to ten words at a time and let him work at the game at his own pace. Parent B indicated that Participant B was capable of spelling 17 words, but in her opinion, the definitions were too difficult. During the Week 4 interview, Parent B indicated the capital letters used in the word matching game was confusing to Participant B. The researchers changed the letters to lower case. Parent B noted that some days Participant B was more willing to engage in vocabulary activities than other days. During each week, Participant B occasionally had extracurricular activities to attend, in those instances Parent B delayed vocabulary activities until after suppertime or before bed. Parent B indicated the activities continued to be productive in those instances, but Participant B did not contribute his full attention. Parent B indicated the games were effective, and she would have liked to have the games available to her all week long. Parent B created different ways to engage Participant B with the game cards, in addition to the two assigned games, and Parent B utilized the games often. Various types of games Parent B created to engage Participant B included matching two word parts to a definition and playing memory style games with both card games. Parent B combined the game cards from one week with a previous week to review all of the words. It was the opinion of Parent B that working on the same vocabulary words over a number of weeks would be a useful modification. Parent B felt a more effective route to assess vocabulary acquisition would be to administer a posttest at the end of the week, provide feedback on the posttest participants were required to integrate on their own at home, provide additional practice in class and at home, and assess the participants a second time in a later week. Parent B felt this would support the rate in which various participants learned in addition to encouraging participants to use feedback to improve their performance.

During the Week 8 interview, Parent B noted the game cards continued to be the most effective resource and were enough to utilize in different ways on different days with Participant B. Participant B used the game cards in a memory style game. Participant B found the broken words from the Tuesday game and match them to the definitions from the Wednesday game. Parent B indicated Participant B worked independently with the card games and enjoyed finding matches and placing them in a small bag as a reward. Parent B felt the researcher could enhance the study by repeating words within lists to support long-term recall. The following section addressed the interviews conducted with Parent C.

Parent C Interviews

During the Week 1 interview, Parent C indicated the biggest concern with the games noted was the use of the word matching. The parent indicated Participant C has a history of playing matching games in previous therapy sessions, and the concept of matching word parts to one another or words to definitions was hard for him to understand because the cards did not match identically. Participant C associated the term match with identical matching not matching based on relationships. Parent C also noted there were too many options for Participant C to choose from, and he did better with fewer options.

During Week 4, Parent C indicated the activities were going well. Participant C did well with the spelling activities but continued to struggle with the concept of matching. Parent C found Participant C was more successful when provided three choices and prompted by parent. Parent C further stated Participant C preferred the writing activities to the games and were therefore more effective.

During the Week 8 interview, Parent C asserted reading the definitions together was the most effective strategy as Participant C is an auditory learner. In addition, Participant C's accuracy increased with the games as the weeks progressed. Parent C felt the least effective strategy was the game requiring Participant C to match definitions. Parent C needed to provide many prompts for this activity. The following section addressed the interviews conducted with Parent D.

Parent D Interviews

During the Week 1 interview, the researcher clarified the project and purpose of the study was to increase parental involvement to encourage growth in vocabulary ability to Parent D.

During the Week 4 interview, Parent D indicated the games were effective for Participant D as he enjoyed them, but he struggled with the Tuesday game, which required him to combine two cards to create a word. Parent D was unable to provide additional explanation regarding Participant D's involvement.

During Week 8, Parent D felt the most effective strategy was the definition matching game. Parent D noted the least effective strategy was combining the two cards to create a word as it was too difficult for him and resulted to too much guessing on his part. The following section addressed the interviews conducted with Parent E.

Parent E Interviews

During the Week 1 interview, Participant E was reluctant to stray from the spelling strategies utilized before the study began. Parent E indicated that due to the researcher not sending home the Week 1 Wednesday game until Thursday, she played the Tuesday game with him again on Wednesday.

During the Week 4 interview, Parent E acknowledged that the activities were all going very well and Participant E was very successful. Participant E understood the at home expectations and had developed a new routine incorporating the activities. Parent E indicated the games were more effective than the writing as Participant E preferred the games to the writing because the games were fun and the stress often attributed with homework was not there. Parent E felt there were no components of the routine that were ineffective for Participant E.

During the Week 8 interview, Parent E indicated the most effective strategy was the combination of games, and it forced Participant E to read the definitions. Parent E felt there was not component that was the not effective. Parent E indicated everything worked well for Participant E, and researchers should not modify the activities. The following section addressed the questionnaires collected from Parent A.

Table 4: Parent Perceived Most/Least Effective Strategies

Parent	Most Effective	Least Effective
A	Both Games	Abstract Words/Definitions
B	Both Games	Not repeating words through the following weekly lists
C	Reading Definitions Aloud	Matching Definitions Game
D	Definition Matching Game	Word Matching Game
E	Both Games	Not Applicable

Parent A Questionnaires

On the Week 2 questionnaire, Parent A stated Participant A wrote each word three times first and then read the words and the meanings. Parent A indicated Participant A followed instructions and read along as needed. The next activity Parent A did with Participant A was wrote each word one time and played the word game. Parent A indicated that Participant A enjoyed the game, and Parent A likened it to doing puzzles. In addition, the easiest part of the

activities was the writing and matching activities. Parent A noted the most challenging part of the activities was memorizing the long definitions. Parent A stated she would like to see one-word meanings for the target words. Initially, Parent A also suggested shorter definitions that participants could visualize and draw, thereby, demonstrating a preference for more concrete words.

On the Week 4 questionnaire, Parent A stated Participant A wrote the words three times and reviewed the definitions. In addition to these activities, Parent A looked for pictures or drew pictures that depicted the target words with Participant A. The participant enjoyed looking at the pictures and attempted to draw some visual representations of the target words as well. The participant demonstrated a preference for the games and found them easy to engage in according to the parent. Parent A indicated the most challenging aspect had been explaining the abstract words. Parent A noted the words that began with the letter *g* or that had the letter *g* within the words were also difficult because Participant A could not hear the /*g*/ sound and did not have the ability to produce it. Participant E, therefore, struggled with spelling these types of words.

On the Week 6 questionnaire, Parent A continued to engage in the routine established, and Participant A began underlining key words within definitions and appeared to enjoy the activity. Parent A also noted that Participant A demonstrated an interest in the matching games and enjoyed putting the words in order according to the weekly spelling list. Parent A noted that Participant A began to struggle with words containing letters such as *l* and *r* in addition to words containing the letter *g*.

On the Week 8 questionnaire, Parent A indicated that Participant A had begun finishing the games at a much faster rate, and he appeared to enjoy all of the activities, although his

struggles with abstract words and particular letters remained. The following section addressed the questionnaires collected from Parent B.

Parent B Questionnaires

On the Week 2 questionnaire, Parent B indicated that she set the activities out near Participant B first and left them sitting out. Parent B would ask Participant B to show her how to complete the activities. Participant B responded to the activities with a tense demeanor and would act out verbally or physically. Parent B ignored these behaviors and encouraged Participant B to show her because she was interested in the activities. Participant B started to engage with the activities. Parent B would not encroach upon Participant B's personal space but provided room to complete the activities independently. It was the opinion of Parent B that the games were the easiest strategy because Participant B could engage in the activity independently. Parent B likened the games to puzzles, and Participant B enjoyed puzzles and was successful with them. Parent B noted the most challenging aspect of the activities was keeping Participant B focused. Parent B responded by providing frequent breaks during the activities.

On the Week 4 questionnaire, Parent B noted Participant B wrote the target words out first. Parent B then wrote the definitions, and Participant B wrote the words next to the corresponding definitions. Parent B further stated that Participant B utilized the card games every day. Parent B indicated that Participant B did not enjoy the activities, but when he completed them independently, he relaxed more than when Parent B assisted him. When Participant B demonstrated signed of anxiety or aggression, Parent B allowed him to take a break or provided him with the option of having Parent B leave him to complete the activities independently. Participant B typically allowed Parent B to remain with him to observe the activities, providing minimal interaction. Parent B noted the games were the easiest activities.

Parent B noted the biggest challenge continued to be keeping Participant B focused and composed. Parent B did not return completed Week 6 or Week 8 questionnaires. The following section addressed the questionnaires collected from Parent C.

Parent C Questionnaires

On the Week 2 questionnaire, Parent C wrote the words with Participant C who was content with the activity and spelled the words correctly instantaneously. Next, Parent C read the definitions with Participant C, and Participant C appeared disinterested. The easiest part was writing the target words down while the most challenging aspect was matching the target words with the definitions. Parent C again indicated to be successful Parent C could only introduce two to three target words at a time. Parent C did not return a completed Week 4 questionnaire.

Based on the Week 6 questionnaire, Participant C continued to require prompting for the matching games but participated well in the games requiring writing the words and reading the definitions. On the Week 8 questionnaire, Parent C indicated Participant C was beginning to increase his accuracy with prompting. Participant C did not demonstrate the ability to match without prompting through the course of the study. The following section addressed the questionnaires collected from Parent D.

Parent D Questionnaires

On the Week 2, 6, and 8 questionnaires, Parent D indicated that Participant D completed the activities first and was reinforced following the activities with a movie, video games, or a board game.

On the Week 4 questionnaire, Parent D indicated that Participant D completed the activities first, and Participant D's reaction was dependent on his comprehension of the material.

If Participant D understood the activity, he completed it willingly. If Participant D did not understand the activity, he would adopt an aggressive temperament. The following section addressed the questionnaires collected from Parent E.

Parent E Questionnaires

On the Week 2 questionnaire, Parent E stated she engaged Participant E by having him write the words and speak each letter as he wrote it. Participant E preferred having to write the target words one time. Parent E noted that Participant E is required to do the activities directly after school, and this modification appeared to increase Participants E's attention compared to previously to completing schoolwork after dinner. Following the writing activities, the parent read the words and definitions aloud with Participant E. Participant E appeared to enjoy the activity and seemed to comprehend target words better when paired with visuals. Parent E noted the easiest part of the lesson instruction was the Tuesday word match game. Participant E utilized all the pieces at once and did very well without complaint. Parent E noted that the most challenging part of the lesson was the Thursday definition matching game. Parent E introduced all game pieces at once, which appeared to frustrate Participant E. Parent E provided less game pieces at one time in the future. Initially, Parent E suggested a shorter word list because Participant E often struggled with recalling all of the words. Words he would initially demonstrate knowledge of, he would confuse later in the week, and Parent E found this very frustrating.

On the Week 4 questionnaire, Parent E noted the routine continued to be the same, and Participant E was familiar with it and participated in it willingly. Participant E utilized the Tuesday and Wednesday games on Thursdays as well. Participant E was familiar with both of

the games and preferred the games to writing the words. The biggest challenge Participant E experienced was the complexity of some of the target words.

On the Week 6 questionnaire, Parent E indicated the routine remained the same. On one occasion, Parent E took Participant E to the library before engaging in the activities, upsetting the daily routine, and Participant E was very frustrated with the activities when it came time to complete them. It was the opinion of Parent E that the daily routine had become very easy and very important for Participant E, and any change in that routine created an upset for Participant E.

On the Week 8 questionnaire, Parent E indicated she had included a quiz on Wednesdays to measure Participant E's retention of the target words and their definitions. On the way to school on Friday morning, Parent E and Participant E did a final read through of the weekly spelling list, and as a reinforcement, Participant E threw away the weekly spelling list before getting out of the car. Parent E noted the most challenging aspect of the activities was the presentation of target words that were not nouns, as Participant E could not make connections to these words. The following section addresses the video clips collected from parents.

Video Clips

In addition to written and verbal correspondence, Parent A emailed a 1 minute 30 second video clip in Week 8 to demonstrate how she conducted at-home activities. Parent A sat with Participant A, touched/pointed to a word, asked the participant to read the word or read it with him. The student wrote the word one time in a notebook. Parent A asked Participant A what the word meant. Many of the definitions had key words underlined that Participant A focused on instead of the entire definition. For example, Parent A had the word *friendly* underlined in the

definition of the word “kindness”. Participant A did not attend to the complete definition, which was “friendly or helpful behavior” but instead only to the word *friendly*. Parent A used verbal praise each time to encourage Participant A, noting his good handwriting and his accurate readings of the words. The following section addresses additional data provided by parents.

Additional Data

In addition to written and verbal correspondence, Parent C came in during Week 6 to demonstrate how she conducted at-home activities using a prompting method. Parent C indicated providing Participant C with all of the choices at one time during the at-home games was overwhelming for Participant C, and he refused to make any selections. Parent C modified the games and provided three choices at a time. Participant C was then willing to participate in the game. Parent C would ask the participant to find the match for a specific card while tapping the card with a pen. Parent C would then tap three choices with a pen while simultaneously reading the words on the card or spelling out the letters on the card depending on the game requirements. Participant C would then respond by touching one of the three response choices. The following section addressed the scores from the pretests and posttests administered by week.

Pretest and Posttest Assessment Data by Week

Vocabulary assessments were administered twice a week for eight weeks as a pretest on Mondays and as a posttest on Fridays. The assessments comprised of two parts, a 17-question spelling section and a 17-question definition matching assessment. Each section listed the final two questions as bonus questions, but included the questions in the data collection process. Comprehensive scores were recorded in Table 5; in addition, spelling section scores and definition matching section scores were recorded in Table 6 and Table 7 respectively. The

following section addressed the scores from the comprehensive pretests and posttests administered by week.

Comprehensive Comparative Analysis

The comprehensive pretest and posttest were used to document receptive and beginning stages of productive vocabulary growth based on the number of items each student got correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom. Specifically, the mean, median, and standard deviation of Table 5 (Comprehensive Scores), Table 6 (Spelling Scores), and Table 7 (Definition Matching Scores) are presented.

Table 5: Comprehensive Scores

Assessment	Student	Week							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pre-Test	**A**	11	9	11	12	13	14	14	11
	B	10	12	12	13	8	23	23	17
Comprehensive Assessment	**C**	29	32	33	28	31	33	34	34
	D	8	9	9	9	8	11	9	8
34 possible points	**E**	14	17	10	11	19	20	21	10
Post-Test	**A**	16	21	14	34	24	34	32	32
	B	23	20	18	19	20	24	29	20
Comprehensive Assessment	**C**	33	31	33	32	32	31	33	34
	D	8	8	11	12	23	27	24	21
34 possible points	**E**	31	31	30	30	32	32	34	29

Week One. Student average scores increased from pre-test (M = 14.40) to post-test scores (M = 22.20); the average score increased by 7.80 points. The median for the pretest raw scores (Md = 11.00) was 12.00 points lower than the median for the posttest raw scores (Md = 23.00). Therefore 50% of the students scored above 11.00 for the pretest compared to the posttest in which 50% of the students scored above 23.00. The standard deviation increased from the pretest to the posttest (SD_1 = 8.44, SD_2 = 10.43), which indicated that the scores for the

pretest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Two. Student average scores increased from pre-test (M = 15.80) to post-test scores (M = 22.20); the average score increased by 6.40 points. The median for the pretest raw scores (Md = 12.00) was 9.00 points lower than the median for the posttest raw scores (Md = 21.00). Therefore 50% of the students scored above 12.00 for the pretest compared to the posttest in which 50% of the students scored above 21.00. The standard deviation decreased slightly from the pretest to the posttest (SD_1 = 9.63, SD_2 = 9.52), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest and the posttest showed more low-end scores (positive skew, M > Md).

Week Three. Student average scores increased from pre-test (M = 15.00) to post-test scores (M = 21.20); the average score increased by 6.20 points. The median for the pretest raw scores (Md = 11.00) was 7.00 points lower than the median for the posttest raw scores (Md = 18.00). Therefore 50% of the students scored above 11.00 for the pretest compared to the posttest in which 50% of the students scored above 18.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 10.12, SD_2 = 9.78), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest showed more low-end scores (positive skew, M > Md).

Week Four. Student average scores increased from pre-test (M = 14.60) to post-test scores (M = 25.40); the average score increased by 10.60 points. The median for the pretest raw scores (Md = 12.00) was 18.00 points lower than the median for the posttest raw scores (Md = 30.00). Therefore 50% of the students scored above 12.00 for the pretest compared to the posttest in which 50% of the students scored above 30.00. The standard deviation increased

from the pretest to the posttest (SD_1 = 7.64, SD_2 = 9.48), which indicated that the scores for the pretest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Five. Student average scores increased from pre-test (M = 15.50) to post-test scores (M = 26.20); the average score increased by 10.40 points. The median for the pretest raw scores (Md = 13.00) was 11.00 points lower than the median for the posttest raw scores (Md = 24.00). Therefore 50% of the students scored above 13.00 for the pretest compared to the posttest in which 50% of the students scored above 24.00. The standard deviation decreased from the pretest to the posttest (SD1 = 9.63, SD2 = 5.50), which indicated that the scores for the posttest were more compact around the mean. The pretest and the posttest showed more low-end scores (positive skew, M > Md).

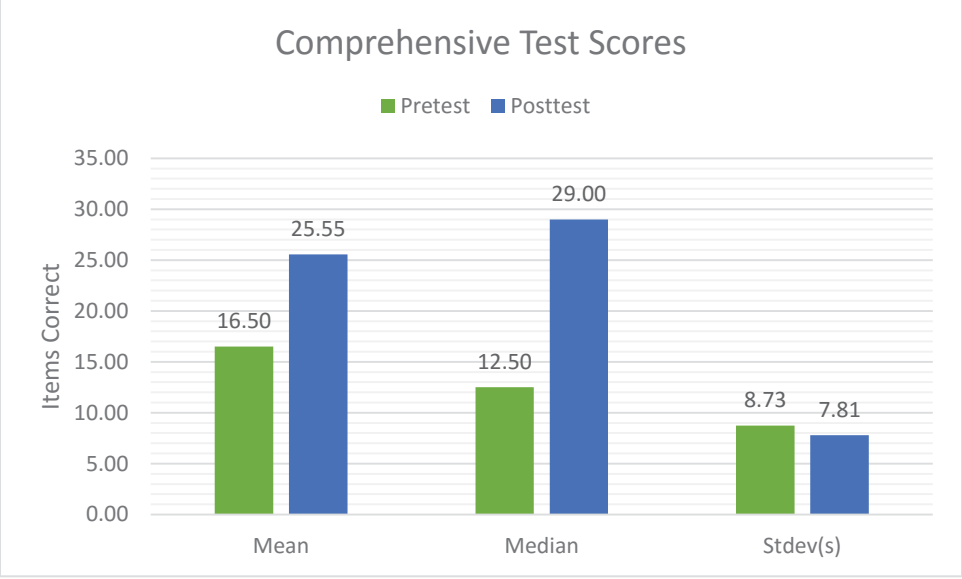
Week Six. Student average scores increased from pre-test (M = 20.20) to post-test scores (M = 29.60); the average score increased by 9.40 points. The median for the pretest raw scores (Md = 20.00) was 11.00 points lower than the median for the posttest raw scores (Md = 31.00). Therefore 50% of the students scored above 20.00 for the pretest compared to the posttest in which 50% of the students scored above 31.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 8.58, SD_2 = 4.04), which indicated that the scores for the posttest were more compact around the mean. The pretest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Seven. Student average scores increased from pre-test (M = 20.20) to post-test scores (M = 30.40); the average score increased by 10.20 points. The median for the pretest raw scores (Md = 21.00) was 11.00 points lower than the median for the posttest raw scores (Md =

32.00). Therefore 50% of the students scored above 21.00 for the pretest compared to the posttest in which 50% of the students scored above 32.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 9.52, SD_2 = 4.04), which indicated that the scores for the posttest were more compact around the mean. The pretest and the posttest showed more high-end scores (negative skew, M < Md).

Week Eight. Student average scores increased from pre-test (M = 16.00) to post-test scores (M = 27.20); the average score increased by 11.20 points. The median for the pretest raw scores (Md = 11.00) was 18.00 points lower than the median for the posttest raw scores (Md = 29.00). Therefore 50% of the students scored above 11.00 for the pretest compared to the posttest in which 50% of the students scored above 29.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 10.61, SD_2 = 6.38), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Graph 1: Comprehensive Scores



Combined Eight Weeks. Graph 1: Comprehensive Scores analysis demonstrates student average scores increased from pre-test (M = 16.50) to post-test scores (M = 25.55); the average score increased by 9.05 points. The median for the pretest raw scores (Md = 12.50) was 16.50 points lower than the median for the posttest raw scores (Md = 29.00). Therefore 50% of the students scored above 12.50 for the pretest compared to the posttest in which 50% of the students scored above 29.00. The standard deviation decreased from the pretest to the posttest (SD1 = 8.73, SD2 = 7.81), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md). The pretests showed more low-end scores (positive skew, M > Md), while the posttests showed more high-end scores (negative skew, M < Md). The following section addressed the scores from the definition matching section of the pretests and posttests by week.

Scores of Spelling Comparative Analysis

The pretest and posttest documented receptive vocabulary growth based on the number of items each student got correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom.

Table 6: Scores of Spelling

Assessment	Student	Week							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pre-Test	**A**	5	3	2	2	2	6	2	2
	B	3	4	6	6	3	9	11	7
Spelling Section	**C**	16	15	16	13	15	16	17	17
	D	1	2	2	0	1	0	0	0
17 possible points	**E**	5	7	1	3	6	10	9	1
Post-Test	**A**	14	11	9	17	15	17	17	15
	B	15	11	10	9	10	13	15	9
	C	16	14	16	15	17	16	17	17

Spelling Section	**D**	3	3	2	0	8	11	7	4
	E	15	16	13	14	17	16	17	16

Week One. Student average scores increased from pre-test (M = 6.00) to post-test scores (M = 15.00); the average score increased by 6.60 points. The median for the pretest raw scores (Md = 5.00) was 10.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the students scored above 5.00 for the pretest compared to the posttest in which 50% of the students scored above 15.00. The standard deviation decreased slightly from the pretest to the posttest (SD1 = 5.83, SD2 = 5.41), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Two. Student average scores increased from pre-test (M = 6.20) to post-test scores (M = 11.00); the average score increased by 4.80 points. The median for the pretest raw scores (Md = 4.00) was 7.00 points lower than the median for the posttest raw scores (Md = 11.00). Therefore 50% of the students scored above 4.00 for the pretest compared to the posttest in which 50% of the students scored above 11.00. The standard deviation decreased slightly from the pretest to the posttest (SD_1 = 5.26, SD_2 = 4.95), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed a higher concentration of scores in the middle of the distribution (normal skew, M = Md).

Week Three. Student average scores increased from pre-test (M = 5.40) to post-test scores (M = 10.00); the average score increased by 4.06 points. The median for the pretest raw scores (Md = 2.00) was 8.00 points lower than the median for the posttest raw scores (Md =

10.00). Therefore 50% of the students scored above 2.00 for the pretest compared to the posttest in which 50% of the students scored above 10.00. The standard deviation decreased from the pretest to the posttest (SD1 = 6.23, SD2 = 5.24), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed a higher concentration of scores in the middle of the distribution (normal skew, M = Md).

Week Four. Student average scores increased from pre-test (M = 4.80) to post-test scores (M = 11.00); the average score increased by 6.20 points. The median for the pretest raw scores (Md = 3.00) was 11.00 points lower than the median for the posttest raw scores (Md = 14.00). Therefore 50% of the students scored above 3.00 for the pretest compared to the posttest in which 50% of the students scored above 14.00. The standard deviation increased from the pretest to the posttest (SD_1 = 5.07, SD_2 = 6.82), which indicated that the scores for the pretest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Five. Student average scores increased from pre-test (M = 5.40) to post-test scores (M = 13.40); the average score increased by 8.00 points. The median for the pretest raw scores (Md = 3.00) was 12.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the students scored above 3.00 for the pretest compared to the posttest in which 50% of the students scored above 15.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 5.68, SD_2 = 4.16), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

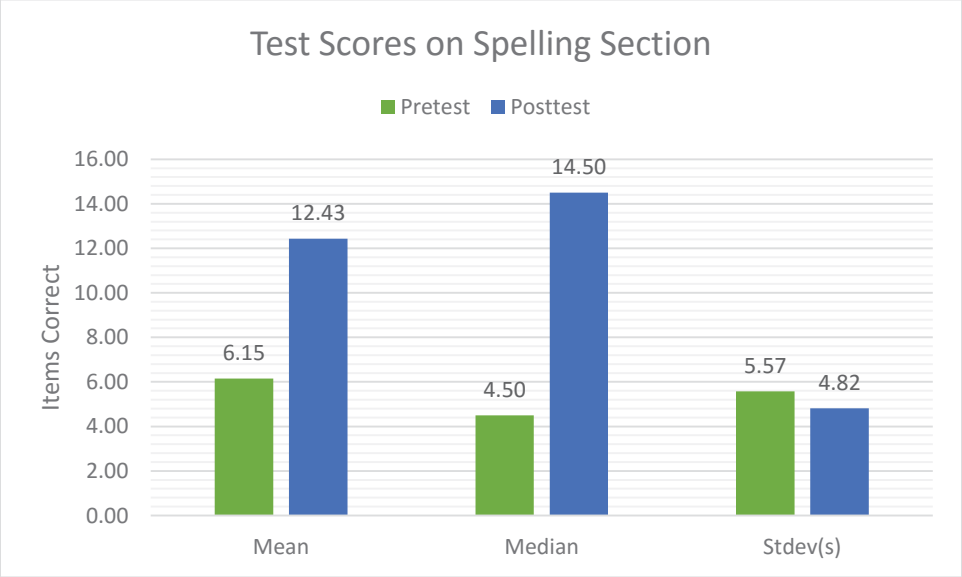
Week Six. Student average scores increased from pre-test (M = 8.20) to post-test scores (M = 14.60); the average score increased by 6.40 points. The median for the pretest raw scores (Md = 9.00) was 7.00 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the students scored above 9.00 for the pretest compared to the posttest in which 50% of the students scored above 16.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 5.85, SD_2 = 2.51), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed more high-end scores (negative skew, M < Md).

Week Seven. Student average scores increased from pre-test (M = 7.80) to post-test scores (M = 14.60); the average score increased by 6.80 points. The median for the pretest raw scores (Md = 9.00) was 8.00 points lower than the median for the posttest raw scores (Md = 17.00). Therefore 50% of the students scored above 9.00 for the pretest compared to the posttest in which 50% of the students scored above 17.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 6.91, SD_2 = 4.34), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Eight. Student average scores increased from pre-test (M = 5.40) to post-test scores (M = 12.20); the average score increased by 6.80 points. The median for the pretest raw scores (Md = 2.00) was 13.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the students scored above 2.00 for the pretest compared to the posttest in which 50% of the students scored above 15.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 7.02, SD_2 = 5.54), which indicated that the scores for the posttest

were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Graph 2: Spelling Scores



Combined Eight Weeks. Graph 2: Spelling Scores analysis demonstrates student average scores increased from pre-test (M = 6.15) to post-test scores (M = 12.43); the average score increased by 5.93 points. The median for the pretest raw scores (Md = 4.50) was 10.00 points lower than the median for the posttest raw scores (Md = 14.50). Therefore 50% of the students scored above 4.50 for the pretest compared to the posttest in which 50% of the students scored above 14.50. The standard deviation decreased from the pretest to the posttest (SD1 = 5.57, SD2 = 4.82), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed more low-end scores (positive skew, M > Md). The following section addressed the scores from the definition matching section of the pretests and posttests administered by week.

Scores of Definition Matching Comparative Analysis

The pretest and posttest were used to document beginning stages of productive vocabulary growth based on the number of items each student got correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom.

Table 7: Scores of Definition Matching

Assessment	Student	Week							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pre-Test	**A**	6	6	9	10	11	8	12	9
	B	7	8	6	7	5	14	12	10
Definition Matching Section	**C**	13	17	17	15	16	17	17	17
	D	7	7	7	9	7	11	9	8
17 possible points	**E**	9	10	9	8	13	10	12	9
Post-Test	**A**	2	10	5	17	9	17	15	17
	B	8	9	8	10	10	11	14	11
Definition Matching Section	**C**	17	17	17	17	15	15	16	17
	D	5	5	9	12	15	16	17	17
17 possible points	**E**	16	15	17	16	15	16	17	13

Week One. Student average scores increased from pre-test (M = 8.40) to post-test scores (M = 9.60); the average score increased by 1.20 points. The median for the pretest raw scores (Md = 7.00) was 1.00 points lower than the median for the posttest raw scores (Md = 8.00). Therefore 50% of the students scored above 7.00 for the pretest compared to the posttest in which 50% of the students scored above 8.00. The standard deviation increased from the pretest to the posttest (SD1 = 2.79, SD2 = 6.66), which indicated that the scores for the pretest were more compact around the mean. The pretest and posttest both showed more low-end scores (positive skew, M > Md).

Week Two. Student average scores increased from pre-test (M = 9.60) to post-test scores (M = 11.20); the average score increased by 1.60 points. The median for the pretest raw scores

(Md = 8.00) was 2.00 points lower than the median for the posttest raw scores (Md = 10.00). Therefore 50% of the students scored above 8.00 for the pretest compared to the posttest in which 50% of the students scored above 10.00. The standard deviation increased slightly from the pretest to the posttest (SD1 = 4.39, SD2 = 4.82), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest and posttest both showed more low-end scores (positive skew, M > Md).

Week Three. Student average scores increased from pre-test (M = 9.60) to post-test scores (M = 11.20); the average score increased by 1.60 points. The median for the pretest raw scores (Md = 9.00) was the same as the median for the posttest raw scores (Md = 9.00). Therefore 50% of the students scored above 9.00 for the pretest and posttest. The standard deviation increased from the pretest to the posttest (SD1 = 4.34, SD2 = 5.50), which indicated that the scores for the pretest were more compact around the mean. The pretest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more low-end scores (positive skew, M > Md).

Week Four. Student average scores increased from pre-test (M = 9.80) to post-test scores (M = 14.40); the average score increased by 4.60 points. The median for the pretest raw scores (Md = 9.00) was 7.00 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the students scored above 9.00 for the pretest compared to the posttest in which 50% of the students scored above 16.00. The standard deviation increased slightly from the pretest to the posttest (SD1 = 3.11, SD2 = 3.21), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Five. Student average scores increased from pre-test (M = 10.40) to post-test scores (M = 12.80); the average score increased by 2.40 points. The median for the pretest raw scores (Md = 11.00) was 4.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the students scored above 11.00 for the pretest compared to the posttest in which 50% of the students scored above 15.00. The standard deviation decreased from the pretest to the posttest (SD1 = 4.45, SD2 = 3.03), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed more high-end scores (negative skew, M < Md).

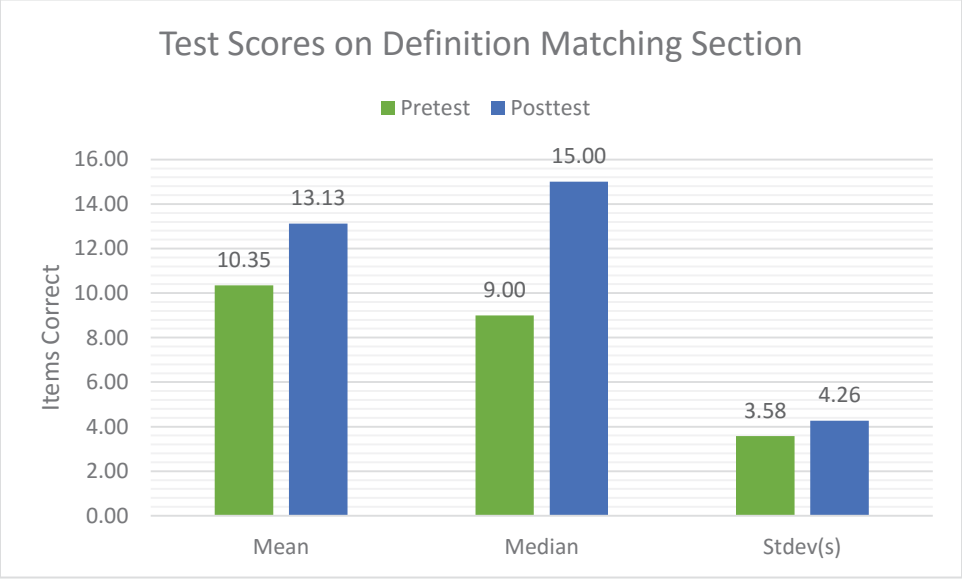
Week Six. Student average scores increased from pre-test (M = 12.00) to post-test scores (M = 15.00); the average score increased by 3.00 points. The median for the pretest raw scores (Md = 11.00) was 5.00 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the students scored above 11.00 for the pretest compared to the posttest in which 50% of the students scored above 16.00. The standard deviation decreased from the pretest to the posttest (SD1 = 3.54, SD2 = 2.35), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Week Seven. Student average scores increased from pre-test (M = 12.40) to post-test scores (M = 15.80); the average score increased by 3.40 points. The median for the pretest raw scores (Md = 12.00) was 4.00 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the students scored above 12.00 for the pretest compared to the posttest in which 50% of the students scored above 16.00. The standard deviation decreased from the pretest to the posttest (SD1 = 2.88, SD2 = 1.30), which indicated that the scores for the

posttest were more compact around the mean. Both the pretest and posttest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md).

Week Eight. Student average scores increased from pre-test (M = 10.60) to post-test scores (M = 15.00); the average score increased by 4.40 points. The median for the pretest raw scores (Md = 9.00) was 8.00 points lower than the median for the posttest raw scores (Md = 17.00). Therefore 50% of the students scored above 9.00 for the pretest compared to the posttest in which 50% of the students scored above 17.00. The standard deviation decreased from the pretest to the posttest (SD1 = 3.65, SD2 = 2.83), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Graph 3: Definition Matching Scores



Combined Eight Weeks. Graph 3: Definition Matching Scores analysis demonstrates student average scores increased from pre-test (M = 10.35) to post-test scores (M = 13.13); the average score increased by 2.78 points. The median for the pretest raw scores (Md = 9.00) was

6.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the students scored above 9.00 for the pretest compared to the posttest in which 50% of the students scored above 15.00. The standard deviation increased from the pretest to the posttest (SD1 = 3.58, SD2 = 4.26), which indicated that the scores for the pretest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md). The following section addressed the scores from the comprehensive pretests and posttests administered by student.

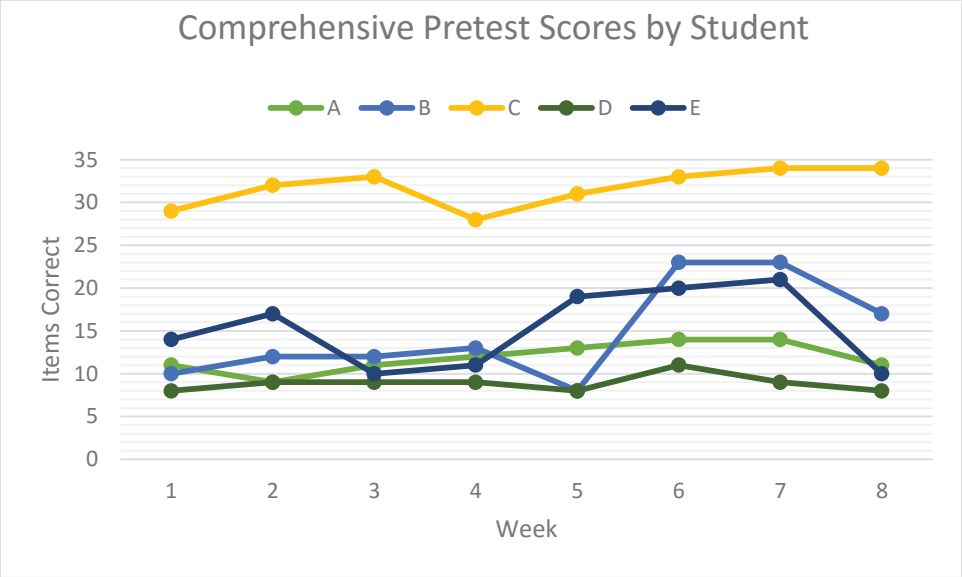
Pretest and Posttest Assessment Data by Student

Scores on the vocabulary assessments recorded twice a week for eight weeks for each individual student. Assessments were administered as a pretest on Mondays and as a posttest on Fridays with modifications made for students based on attendance. If a student was not in class during an assessment day, the assessment was administered the following school day. Comprehensive scores were recorded; in addition, spelling section scores and definition matching section scores were recorded to measure student growth in the area of productive and receptive vocabulary growth. The following section provided a comparative analysis of individual student scores from the comprehensive pretest and posttests.

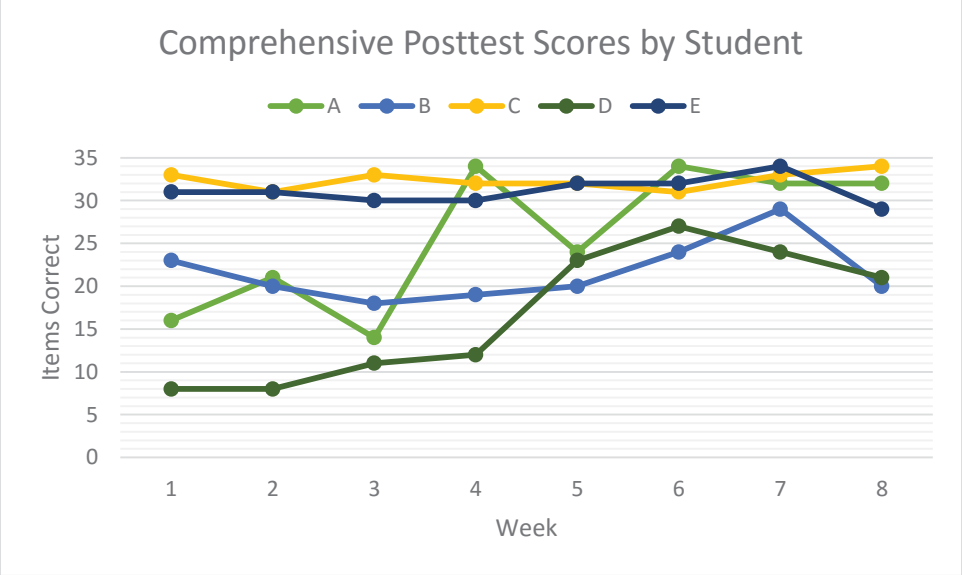
Comprehensive Comparative Analysis

The comprehensive pretest and posttest for each student were used to document individual receptive and productive vocabulary growth based on the number of items correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom.

Graph 4: Comprehensive Pretest Scores by Student



Graph 5: Comprehensive Posttest Scores by Student



Participant A. Student A's average score increased from pre-test (M = 11.88) to post-test scores (M = 25.88); the average score increased by 14.00 points. The median for the pretest

raw scores (Md = 11.50) was 16.50 points lower than the median for the posttest raw scores (Md = 28.00). Therefore 50% of the participant's scores fell above 11.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 28.00. The standard deviation increased from the pretest to the posttest (SD_1 = 1.73, SD_2 = 8.22), which indicated that the scores for the pretest were more compact around the mean. The pretest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more high-end scores (negative skew, M < Md).

Participant B. T Student B's average score increased from pre-test (M = 14.75) to post-test scores (M = 21.63); the average score increased by 6.88 points. The median for the pretest raw scores (Md = 12.50) was 7.50 points lower than the median for the posttest raw scores (Md = 20.00). Therefore 50% of the participant's scores fell above 12.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 20.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 5.70, SD_2 = 3.58), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed more low-end scores (positive skew, M > Md).

Participant C. Student C's average score increased from pre-test (M = 31.75) to post-test scores (M = 32.38); the average score increased by 0.63 points. The median for the pretest raw scores (Md = 32.50) was the same as the posttest raw scores (Md = 32.50). Therefore 50% of the participant's scores fell above 32.50 for the pretest and the posttest. The standard deviation decreased from the pretest to the posttest (SD_1 = 2.25, SD_2 = 1.06), which indicated that the scores for the posttest were more compact around the mean. The pretest showed more high-end scores (negative skew, M < Md), while the posttest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md).

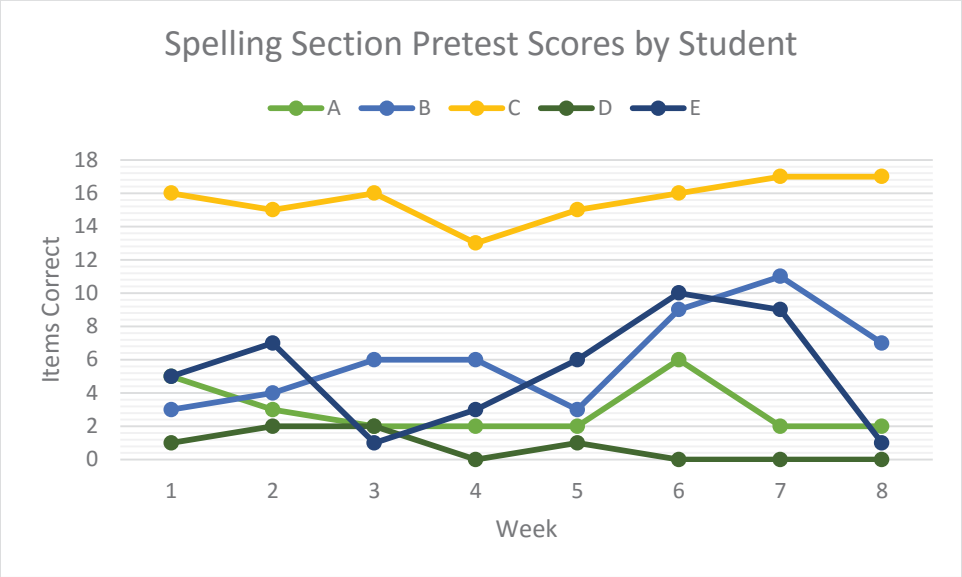
Participant D. Student D's average score increased from pre-test (M = 8.88) to post-test scores (M = 16.75); the average score increased by 7.87 points. The median for the pretest raw scores (Md = 9.00) was 7.50 points lower than the median for the posttest raw scores (Md = 16.50). Therefore 50% of the participant's scores fell above 9.00 for the pretest compared to the posttest in which 50% of the participant's scores fell above 16.50. The standard deviation increased from the pretest to the posttest (SD_1 = 0.99, SD_2 = 7.78), which indicated that the scores for the pretest were more compact around the mean. The pretest showed more high-end scores (negative skew, M < Md), while the posttest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md).

Participant E. Student E's average score increased from pre-test (M = 15.25) to post-test scores (M = 31.13); the average score increased by 15.88 points. The median for the pretest raw scores (Md = 15.50) was 15.50 points lower than the median for the posttest raw scores (Md = 31.00). Therefore 50% of the participant's scores fell above 15.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 31.00. The standard deviation decreased from the pretest to the posttest (SD_1 = 4.59, SD_2 = 1.55), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed a concentration of scores in the middle of the distribution (near normal skew, M = Md). The following section provided a comparative analysis of individual student scores from the pretest and posttest spelling sections.

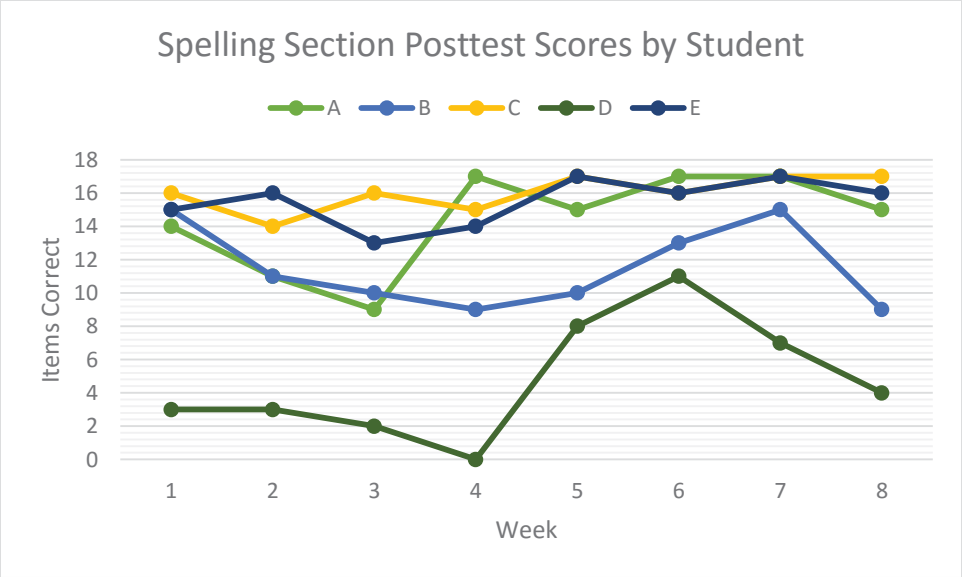
Spelling Section

The comprehensive pretest and posttest for each student were used to document individual receptive vocabulary growth based on the number of items correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom.

Graph 6: Spelling Section Pretest Scores by Student



Graph 7: Spelling Section Posttest Scores by Student



Participant A. Student A's average score increased from pre-test (M = 3.00) to post-test scores (M = 12.28); the average score increased by 11.28 points. The median for the pretest raw scores (Md = 2.00) was 13.00 points lower than the median for the posttest raw scores (Md = 15.00). Therefore 50% of the participant's scores fell above 2.00 for the pretest compared to the

posttest in which 50% of the participant's scores fell above 15.00. The standard deviation increased from the pretest to the posttest (SD_1 = 1.60, SD_2 = 2.97), which indicated that the scores for the pretest were more compact around the mean. The pretest showed more low-end scores (positive skew, M > Md), while the posttest showed more high-end scores (negative skew, M < Md).

Participant B. Student B's average score increased from pre-test (M = 6.13) to post-test scores (M = 11.50); the average score increased by 5.37 points. The median for the pretest raw scores (Md = 6.00) was 4.50 points lower than the median for the posttest raw scores (Md = 10.50). Therefore 50% of the participant's scores fell above 6.00 for the pretest compared to the posttest in which 50% of the participant's scores fell above 10.50. The standard deviation decreased slightly from the pretest to the posttest (SD_1 = 2.85, SD_2 = 2.51), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more low-end scores (positive skew, M > Md).

Participant C. Student C's average score increased from pre-test (M = 15.63) to post-test scores (M = 16.00); the average score increased by 0.37 points. The median for the pretest raw scores (Md = 16.00) was the same as the median for the posttest raw scores (Md = 16.00). Therefore 50% of the participant's scores fell above 16.00 for both the pretest and the posttest. The standard deviation decreased slightly from the pretest to the posttest (SD_1 = 1.30, SD_2 = 1.07), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest and posttest both showed a concentration of scores in the middle of the distribution (near normal skew and normal skew, M = Md).

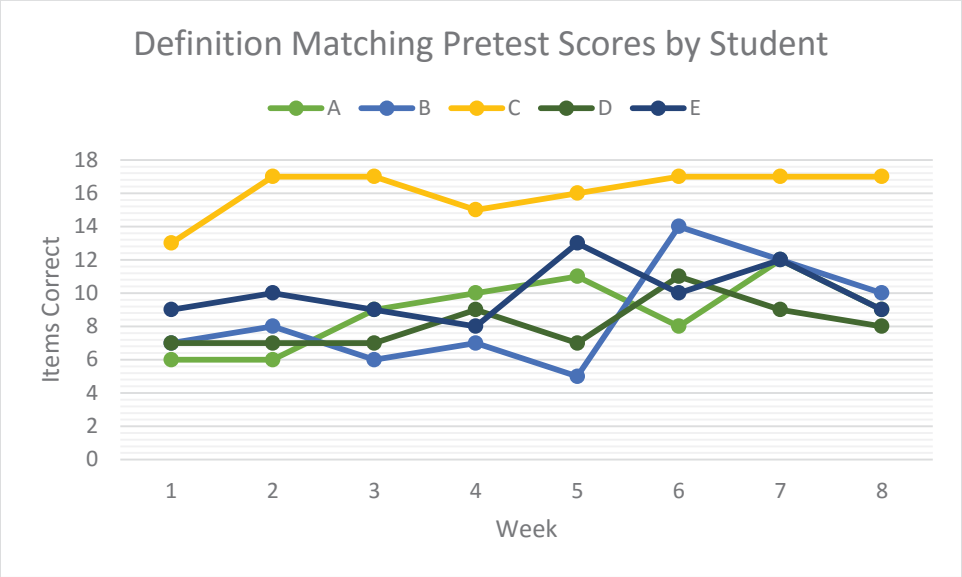
Participant D. Student D's average score increased from pre-test (M = 0.75) to post-test scores (M = 4.75); the average score increased by 4.00 points. The median for the pretest raw scores (Md = 0.50) was 3.00 points lower than the median for the posttest raw scores (Md = 3.50). Therefore 50% of the participant's scores fell above 0.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 3.50. The standard deviation increased from the pretest to the posttest ($SD_1 = 0.89$, $SD_2 = 3.62$), which indicated that the scores for the pretest were more compact around the mean. The pretest w showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttest showed more low-end scores (positive skew, M > Md).

Participant E. Student E's average score increased from pre-test (M = 5.25) to post-test scores (M = 15.50); the average score increased by 10.25 points. The median for the pretest raw scores (Md = 5.50) was 10.50 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the participant's scores fell above 5.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 16.00. The standard deviation decreased from the pretest to the posttest ($SD_1 = 3.41$, $SD_2 = 1.41$), which indicated that the scores for the posttest were more compact around the mean. The pretest and posttest both showed a concentration of scores in the middle of the distribution (near normal skew, M = Md). The following section provided a comparative analysis of individual student scores from the pretest and posttest definition matching sections.

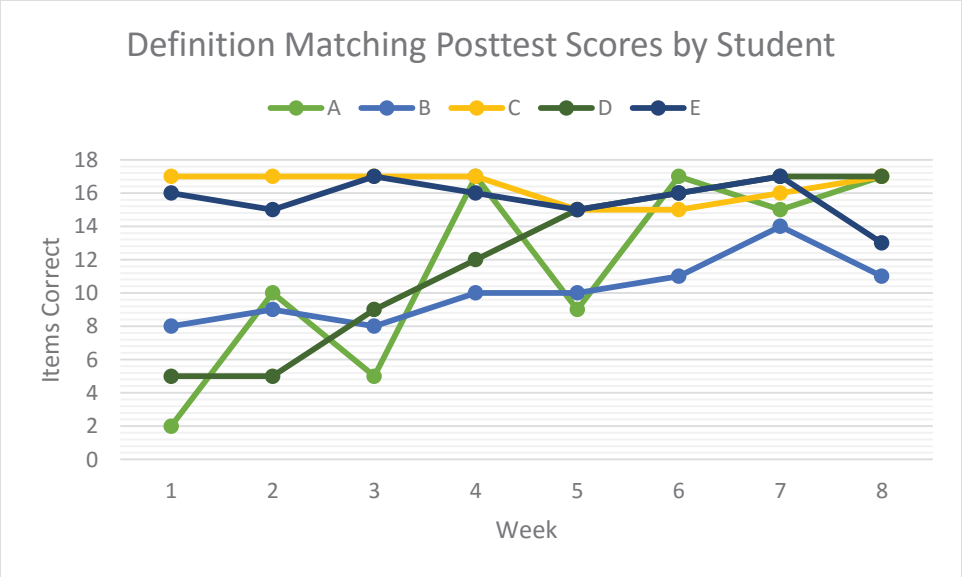
Definition Matching Section

The comprehensive pretest and posttest for each student were used to document individual productive vocabulary growth based on the number of items correct on the test after a week of implementing vocabulary acquisition techniques at home and in the classroom.

Graph 8: Definition Matching Pretest Scores by Student



Graph 9: Definition Matching Posttest Scores by Student



Participant A. Student A's average score increased from pre-test (M = 8.88) to post-test scores (M = 11.50); the average score increased by 2.62 points. The median for the pretest raw scores (Md = 9.00) was 3.50 points lower than the median for the posttest raw scores (Md = 12.50). Therefore 50% of the participant's scores fell above 9.00 for the pretest compared to the

posttest in which 50% of the participant's scores fell above 12.50. The standard deviation increased from the pretests to the posttests ($SD_1 = 2.17$, $SD_2 = 5.90$), which indicated that the scores for the pretest were more compact around the mean. The pretests showed a concentration of scores in the middle of the distribution (near normal skew, M = Md), while the posttests showed more high-end scores (negative skew, M < Md).

Participant B. Student B's average score increased from pre-test (M = 8.63) to post-test scores (M = 10.13); the average score increased by 1.50 points. The median for the pretest raw scores (Md = 7.50) was 2.50 points lower than the median for the posttest raw scores (Md = 10.00). Therefore 50% of the participant's scores fell above 7.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 10.00. The standard deviation decreased from the pretests to the posttests ($SD_1 = 3.11$, $SD_2 = 1.96$), which indicated that the scores for the posttest were more compact around the mean. The pretests showed more low-end scores (positive skew, M > Md), while the posttest showed a concentration of scores in the middle of the distribution (near normal skew, M = Md).

Participant C. Student C's average score increased from pre-test (M = 16.13) to post-test scores (M = 16.38); the average score increased by 0.25 points. The median for the pretest raw scores (Md = 17.00) was the same as the median for the posttest raw scores (Md = 17.00). Therefore 50% of the participant's scores fell above 17.00 for both the pretest and the posttest. The standard deviation decreased from the pretests to the posttests ($SD_1 = 1.46$, $SD_2 = 0.92$), which indicated that the scores for the posttest were more compact around the mean. The pretests and posttest both showed more high-end scores (negative skew, M < Md).

Participant D. Student D's average score increased from pre-test (M = 8.13) to post-test scores (M = 12.00); the average score increased by 3.87 points. The median for the pretest raw

scores (Md = 7.50) was 3.00 points lower than the median for the posttest raw scores (Md = 13.50). Therefore 50% of the participant's scores fell above 7.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 13.50. The standard deviation increased from the pretests to the posttests ($SD_1 = 1.46$, $SD_2 = 5.10$), which indicated that the scores for the pretest were more compact around the mean. The pretests showed more low-end scores (positive skew, M > Md), while the posttests showed more high-end scores (negative skew, M < Md).

Participant E. Student E's average score increased from pre-test (M = 10.00) to post-test scores (M = 15.63); the average score increased by 5.63 points. The median for the pretest raw scores (Md = 9.50) was 6.50 points lower than the median for the posttest raw scores (Md = 16.00). Therefore 50% of the participant's scores fell above 9.50 for the pretest compared to the posttest in which 50% of the participant's scores fell above 16.00. The standard deviation decreased slightly from the pretests to the posttests ($SD_1 = 1.69$, $SD_2 = 1.30$), which indicated that the distribution of scores around the mean were very similar from the pretest to the posttest. The pretest and posttest both showed a concentration of scores in the middle of the distribution (near normal skew, M = Md). The following section addresses other comparative analysis used to analyze data collected through the study.

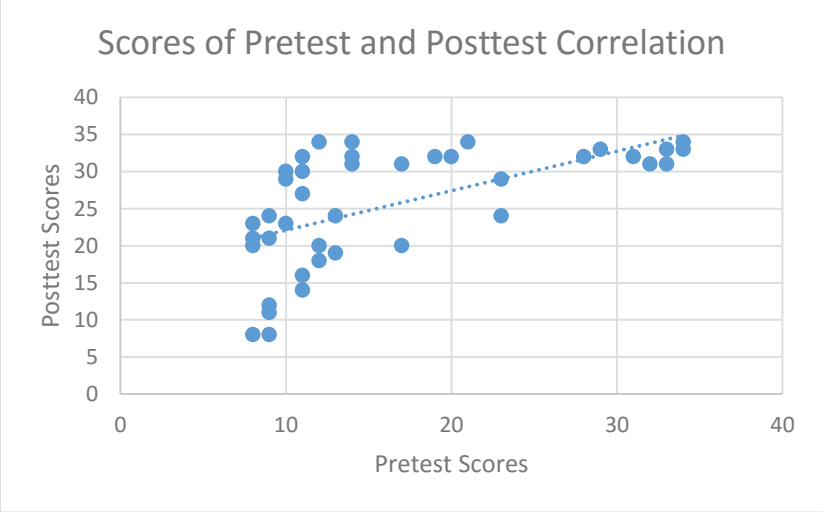
Other Comparative Analysis

After the pretest and posttest comparative analysis, the pretests and posttests comprehensive scores (.75) and scores of spelling (.56) and definition matching (.54) were correlated. The correlation, which is the strength of the relationship was determined by using the general interpretation Table 8.

Table 8: General Interpretation of Correlation Coefficient

General Interpretation	Weak or None	Weak	Moderate	Strong	Very Strong
Size of Correlation Coefficient	.00 - .20	.20 - .40	.40 - .60	.60 - .80	.80 – 1.00
Source: Taken from Kahlscheuer, S. (2014) Lecture 4: Correlation PowerPoint slides retrieved from Cardinal Stritch University Angel Learning Management System					

Graph 10: Comprehensive Scores of Pretest and Posttest Correlation

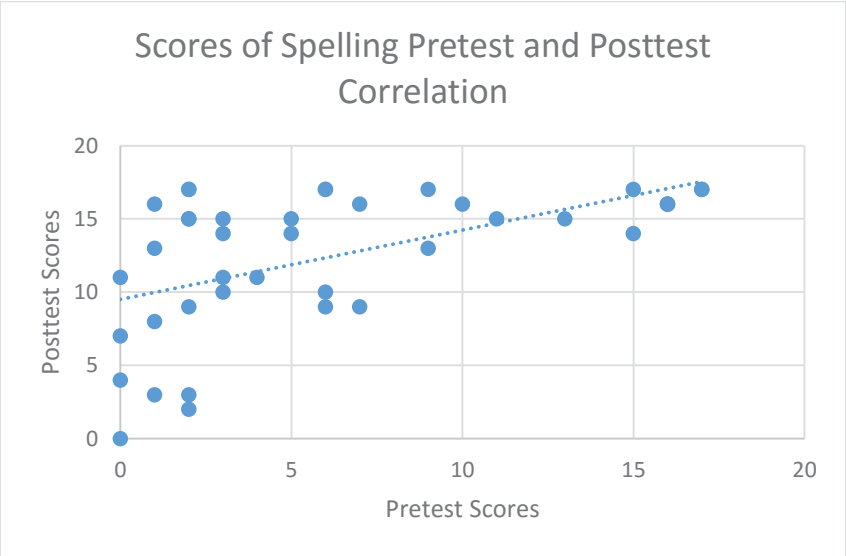


Comprehensive Scores

Graph 10: Comprehensive Scores of Pretest and Posttest Correlation demonstrates a moderate, positive correlation. The coefficient of correlation, r = 0.75, is a significant correlation with a critical value of $r_{(0.05, 38)} = 0.312$. As the pretest scores increase, the comprehensive posttest scores increase. The correlation strength of the relationships between the comprehensive pretest and the posttests were: very strong relationship between the pre-test and post-test Week 5 (.879) and a strong relationship between pre-test and post-test of Week 1 (.745),

Week 2 (.725), Week 3 (.676) as well as Week 7 (.628). There was a moderate relationship determined between the pretest and posttest of Week 4 (.465) and Week 8 (.480). There was a weak to no relationship between the pre-tests and post-tests in Week 6 (-.011). The conclusion drawn on the correlation between the pretest and posttest of comprehensive scores is that they are related.

Graph 11: Scores of Spelling Pretest and Posttest Correlation

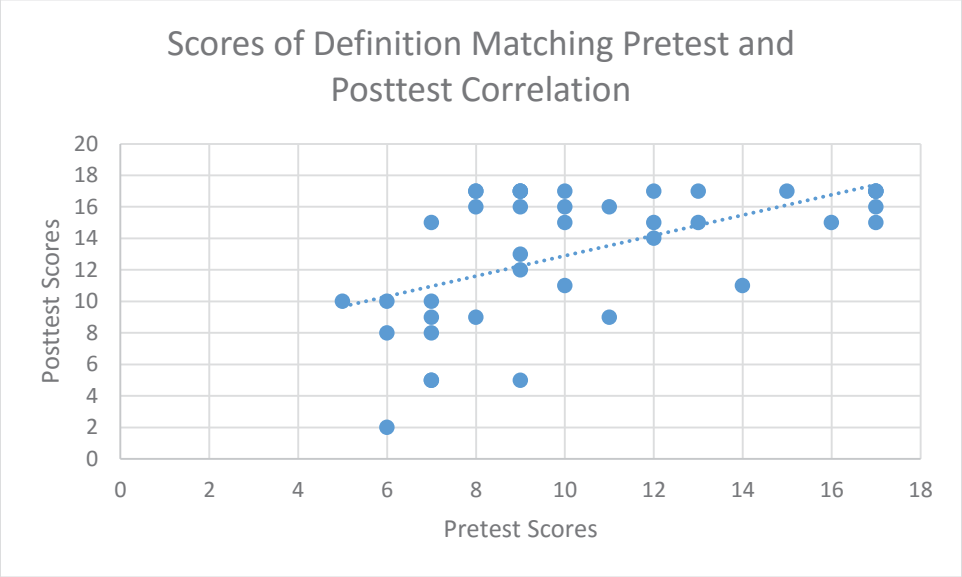


Scores of Spelling

Graph 11: Scores of Spelling Pretest and Posttest Correlation demonstrates a moderate, positive correlation. The coefficient of correlation, r = 0.56, is a significant correlation with a critical value of $r_{(0.05, 38)} = 0.312$. As the pretest spelling scores increase, the posttest spelling scores increase. The correlation strength of the relationships between the comprehensive pretest and the posttests were: strong relationship between pre-test and post-test of Week 2 (.614), Week 3 (.319), Week 5 (.668), as well as Week 6 (.619). There was a moderate relationship determined between the pretest and posttest of Week 1 (.562), Week 4 (.441), Week 7 (.597), and

Week 8 (.440). The conclusion drawn on the correlation between the pretest and posttest of comprehensive scores is that they are related.

Graph 12: Scores of Definition Matching Pretest and Posttest Correlation



Scores of Definition Matching

Graph 12: Scores of Definition Matching Pretest and Posttest Correlation demonstrates a moderate, positive correlation. The coefficient of correlation, r = 0.54, is a significant correlation with a critical value of $r_{(0.05, 38)} = 0.312$. As the pretest definition matching scores increase, the posttest definition matching scores increase. The correlation strength of the relationships between the comprehensive pretest and the posttests were: very strong relationship between the pretest and posttest Week 1 (.871) and Week 2 (.808) and a strong relationship between pretest and posttest of Week 3 (.633) and Week 4 (.635). There was a moderate relationship determined between the pretest and posttest of Week 5 (.433) and Week 6 (-.572). There was a weak relationship between the pretests and posttests in Week 8 (.242) and a weak to no relationship between the pretests and posttest in Week 7 (-.173). The conclusion drawn on

the correlation between the pretest and posttest of comprehensive scores is that they are related. The following section addressed the t-test analysis of the comprehensive pretest/posttest assessments.

T-Test Analysis of Pretest/Posttest Scores

The researcher hypothesized that participants would demonstrate significant improvement from the pretest to the posttest scores following the implementation of the strategies through the week. The null hypothesis states there is no significant improvement from the pretest to the posttest scores following the implementation of the strategies through the week. For each pre-test and post-test of the comprehensive scores, scores of spelling, and scores of definition matching a one tailed, dependent t-test was completed with the probability level of $p < .05$ to investigate causation. The researcher analyzed data by comprehensive scores, scores of spelling and scores of definition meaning.

The obtained t-test *p*-values for comprehensive scores (.000), scores of spelling (.000) and scores of definition meaning (.000) do not exceed the level of significance $p < 0.05$. The values were compared to the value in the critical values of the t distribution in Table 9. The following section addressed the correlation between assessment scores and on/off task behavior during the assessment.

Table 9: Critical Values

df	Level of significance for one-tailed test					
	.10	**.05**	**.025**	**.01**	**.005**	**.0005**
30	1.310	1.697	2.042	2.457	2.750	3.646
Source: Taken from Table IV of Fisher and Yates: Statistical Tables for Biological, Agricultural and Medicinal Research published by Longman Group UK Ltd, London						

T-Test Analysis of Pretest/Posttest Scores by Student

For each student pretest and posttest of comprehensive scores, scores of spelling and scores of definition meaning a one tailed, dependent t-tests was completed with the $p < 0.05$ to investigate causation.

Table 10: Student T-Test *p*-Value Scores

Student	Comprehensive Scores	Scores of Spelling	Scores of Definition Meaning
A	.000	.000	.103
B	.001	.001	.051
C	.230	.175	.360
D	.010	.012	.020
E	.000	.000	.000

Participant A. The computation of the t-test *p*-value for comprehensive scores (.000), scores of spelling (.000) and scores of definition meaning (.103) are shown in the above Table 8. Therefore, the null hypothesis that states there is no difference between the pre-tests and the post-tests is rejected at a significance level of $p < 0.05$.

Participant B. The computation of the t-test *p*-value for comprehensive scores (.001), scores of spelling (.001) and scores of definition meaning (.051) are shown in the above Table 8.

Therefore, the null hypothesis that states there is no difference between the pre-tests and the post-tests is rejected at a significance level of $p < 0.05$.

Participant C. The computation of the t-test *p*-value for comprehensive scores (.230), scores of spelling (.175) and scores of definition meaning (.360) are shown in the above Table 8. Therefore, the null hypothesis that states there is no difference between the pre-tests and the post-tests is accepted at a significance level of $p < 0.05$.

Participant D. The computation of the t-test *p*-value for comprehensive scores (.010), scores of spelling (.012) and scores of definition meaning (.020) are shown in the above Table 8. Therefore, the null hypothesis that states there is no difference between the pre-tests and the post-tests is rejected at a significance level of $p < 0.05$.

Participant E. The computation of the t-test *p*-value for comprehensive scores (.000), scores of spelling (.000) and scores of definition meaning (.000) are shown in the above Table 8. Therefore, the null hypothesis that states there is no difference between the pre-tests and the post-tests is rejected at a significance level of $p < 0.05$.

In summary, Students A, B, D, and E demonstrated significant improvement from the comprehensive pretest to the comprehensive posttest. Students A, B, D, and E demonstrated significant improvement from the pretest to the posttest in the spelling section. Students D and E demonstrated significant improvement from pretest to the posttest in the definition matching section. The following section addressed on-off task behavior exhibited during the pretests and posttests administered.

Pretest/Posttest Scores and On/Off Task Behavior Correlation

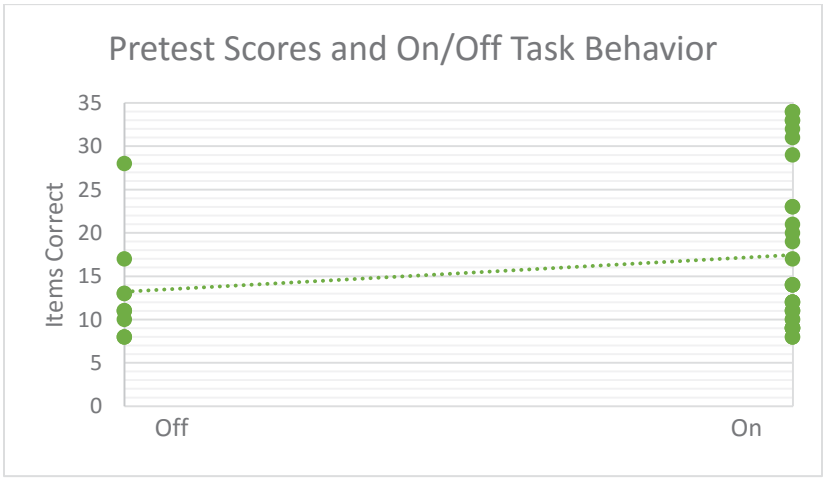
A record of on/off task behavior was used to determine if behavior could be an indicator of lower test scores on the vocabulary assessments. The researcher collected on and off task behavioral data for each comprehensive pretest and posttest.

Table 11: On/Off Behavior

Test	Student	Week							
		1	2	3	4	5	6	7	8
Pre-Test	A	On	On	Off	On	Off	On	On	On
	B	Off	On	On	Off	Off	On	Off	Off
	C	On	On	On	Off	On	On	On	On
	D	On	On	On	On	Off	On	On	On
	E	On	On	On	Off	On	On	On	On
Post-Test	A	On	Off	Off	On	Off	Off	On	On
	B	On	On	Off	Off	Off	On	Off	Off
	C	Off	On	On	On	On	On	On	On
	D	Off	Off	On	Off	On	On	On	On
	E	On	On	On	On	On	On	On	On

The researcher ran a Point-Biserial Correlation to determine the relationship between weekly test scores and observed on/off task behavior because researchers measured weekly test scores on an interval scale and on/off task behavior on a nominal scale.

Graph 13: Pretest Scores and On/Off Task Behavior



Graph 13: Pretest Scores and On/Off Task Behavior demonstrates on task behavior tended to result in higher test scores than off task behavior r_{pb} = .20, t-test = 1.25, $p < .05$ (positive weak) during the pretest. The critical score from the t-table at $p < .05$ and DF = 38.00 is 1.70. Therefore, as the on task behavior went up, the test scores also went up, but this was not a significant relationship. Participants exhibiting on task behavior did not perform significantly higher on the test than participants exhibiting off task behavior.

Graph 14: Posttest Scores and On/off Task Behavior

Graph 14: Posttest Scores and On/Off Task Behavior demonstrates on task behavior tended to result in higher test scores than off task behavior r_{pb} = .50, t-score = 3.57, $p < .05$ (positive moderate) during the posttest. The critical score from the t-table at $p < .05$ and DF = 38.00 is 1.70. Therefore, as the on task behavior went up, the test scores also went up, and this was a significant relationship. Participants exhibiting on task behavior performed significantly higher on the test than participants exhibiting off task behavior.

In summary, on task behavior was related to higher test scores; however, this relationship was significant only in the posttest assessments. The following section addressed results seen related of the implementation of the vocabulary acquisition strategy.

Conclusion

The purpose of this study was to determine the effectiveness of parental involvement as it relates to the vocabulary acquisition of male, middle school students with Autism Spectrum Disorder. Part 1 provided demographic information from observations collected over the course of the eight-week study. Part 2 presented the information collected from parental data, which included interviews, questionnaires, video clips, and additional information. The third part presented pretest and posttest assessment data for each week with an additional analysis for the combined eight weeks. The data presented in comprehensive scores and separated into assessment section scores, spelling and definition matching. Part 4 presented pretest and posttest assessment data for individual participants. Additionally, the data presented in comprehensive scores, spelling section scores, and scores of definition matching. Part 5 presented correlations between the pretests and posttests comprehensive scores and scores of spelling and definition matching. The sixth part presented t-test analysis of pretest/posttest scores of comprehensive scores, scores of spelling, and scores of definition matching while Part 7 presented t-test analysis of pretest/posttest scores for each student. Part 8 presented correlation between scores and on/off task behavior. Now, Chapter 5 will provide a discussion of the results related to the review of literature, strengths and limitation of the study, as well as recommendations for future research.

Chapter V

CONCLUSIONS

Adamski, Fraser, and Peiro (2013) study suggested that parental involvement is a very effective tool where student success is concerned. In addition, Boyd, McDonough, Rupp, Khan, and Bodfish (2011) study recognized the benefits of parental involvement seen in students with ASD. Wei and Attan (2014) study acknowledged vocabulary acquisition as necessary for comprehension of one's native language. Benefits of a less traditional lecture approach to instructing were seen in students' vocabulary acquisition, specifically the importance of manipulatives, student choice, and support from an educator. Wei and Attan (2014) study verified that students favor more engaging vocabulary acquisition strategies and have negative opinions regarding traditional methods, which were viewed as monotonous.

The purpose of the action research project was to determine the effectiveness of parental involvement on vocabulary acquisition of male, middle school students with ASD through multiple, different learning activities including game playing, rote copying, and read-alouds. This chapter will focus on the explanation of the research results, strengths and limitations of the research and recommendations for future research.

Parental Involvement

George and Mensah (2010) study encouraged a connection between school and parents to increase valuable, constructive parental involvement. The researchers found the more that schools actively tried to include parents in educational activities, the happier parents were to oblige. George and Mensah (2010) study found if schools wanted to increase effective parental involvement, they needed to provide parents with direction. In addition, Adamski, Fraser, and Perio (2013) study emphasized the importance of parents' engagement in educational endeavors to mold the attitudes of students on the value of instruction. The more parents cared about school-related activities, the more students adopted that same belief.

The researcher considered and applied the results of parental involvement for children with ASD found in the preceding studies. The researcher included parents in techniques related to vocabulary acquisition. Parents were provided with detailed directions related to the activities to complete with their student each night. Parents occasionally took liberties to modify the activities according to their student ability, but students received the benefits of parental involvement through the course of each week. The more importance parents placed on the activities related to this study, the more students were willing to alter their routine to incorporate the vocabulary activities. The following section addressed the connection between the study and prior research related to parental involvement and students with ASD.

Parental Involvement and Students with ASD

Kelly, Garnett, Attwood, and Peterson (2008) study indicated that parental involvement affected students with ASD. The researchers found a relationship between the presence of a calm or stressful environment within the home and the behaviors of students with ASD. Boyd, McDonough, Rupp, Khan, and Bodfish (2011) study encouraged parental involvement in the implementation of strategies to decrease repetitive, maladaptive behaviors often seen in children with ASD. The researchers discovered consistent parental involvement when engaging in specified activities resulted in a successful decrease in negative behaviors seen in children with ASD. Vacco (2002) found parental involvement was important in helping students achieve success. The researcher also indicated the relationship between the parents and the instructor was important. If parents felt confident in the abilities in the instructor, parents were more willing to collaborate with the instructor.

The researcher considered and applied the results of parental involvement for children with ASD found in the preceding studies. Parental techniques related to vocabulary acquisition

were included. Parents were provided with opportunities to interact with their student in positive ways that would be engaging and collaborative. Consistent parental involvement through the week was requested to assist students in acquiring the target words and their definitions. In addition, the researcher frequently communicated with parents, truly considered parental requests and provided frequent feedback on student performance. The following section addressed the connection between the study and prior research related to vocabulary acquisition.

Vocabulary Acquisition Strategies

Walters and Bozkurt (2009) study discovered the implementation of different strategies to enhance vocabulary acquisition was effective, which included introducing students to various attributes of a word and allowing time for collaboration with peers. The researchers assigned vocabulary notebook activities and collected data indicating that students and educators both had positive feelings towards the varying activities. Wei and Attan (2014) discovered that presenting different vocabulary acquisition strategies and allowing students to choose their preference was effective in increasing vocabulary acquisition. Researchers presented both Read-Plus and Rote-Copying strategies as selections for students. Howrey and Quinn (2014) revealed that the implementation of vocabulary strategies, utilizing both print and electronic materials, was effective, but educators' support of student learning yielded the most significant results. Orawiwatnakul (2011) found that focusing on a single strategy when encouraging vocabulary acquisition was redundant, and to increase engagement, educators needed to offer a variety of activities. Dada and Alant (2009) discovered the use of manipulatives and visual supports successfully developed connections to target words and increased student vocabulary acquisition. Moore and Calvert (2000) discovered that to increase vocabulary acquisition, students required engaging resources outside of teacher-led instruction.

The researcher considered and applied the results of vocabulary acquisition strategies found in the preceding studies. Multiple techniques related to vocabulary acquisition were embedded in the study. This eight-week study explored the effects of parental involvement on vocabulary acquisition of male, middle school students with Autism Spectrum Disorder. The hypothesis for the study was that parental involvement would increase vocabulary acquisition of male, middle school students with ASD. The null hypothesis states that there would be no increase in vocabulary acquisition of male, middle school students with ASD. Alternate ways to procure information, including the addition of games with word cards to engage participants and provide access to manipulatives, were provided. Parents were provided with liberties to extend vocabulary activities beyond the required daily tasks to allow parents to identify their own students' strengths and build opportunities for learning that catered to those strengths, which provided additional opportunities to interact in activities students felt were effective. Adult support was required through all activities, but removed the necessity for students to obtain information through the instructor alone. The following section provided an explanation of the results obtained through the course of this study.

Explanation of Results

Through the course of the eight-week study, observations were made concerning student attitudes regarding the activities related to vocabulary acquisition. In the beginning of the study, students were unfamiliar with the concept of pretests and were confused and upset by the unfamiliar content distributed knowing answers provided were incorrect. As the study progressed, students became familiar with the routine and more effort was allotted to pretests such as attempts to sound out unfamiliar words, with some students demonstrating an interest in their performance at the conclusion of the assessment.

In addition, students appeared to be less frustrated and disengaged with the activities as the study progressed. Initially, student responses to in class and at home activities were resistant to routine changes and maladaptive behaviors were demonstrated such as aggressive outbursts and refusal to participate. As weeks advanced, students became familiar with the new activities and required additional prompting to provide best efforts when completing activities such as fully reading items before responding.

Parents noted an increased interest in the new vocabulary activities, specifically the card games. Parents related the games to puzzles and confirmed the students enjoyed and were able to successfully complete puzzles. One parent noted the increase in parental involvement lead to more aggressive student behaviors. The parent limited parental involvement to intermittent checks for understanding and watching from a distance.

Parents were eager to assist the researcher in this study. Parents found the increase in involvement through structured activities to be engaging and effective. Parents were eager to provide verbal feedback and written feedback in the form of notes sent to school with students. Parents shared suggestions and concerns with the researcher and respected decisions made by the researcher following the suggestions. Parents were cooperative in all interview feedback attempts. Collecting completed questionnaires from parents was more questionnaires to be frustrating, while others provided responses unrelated to the vocabulary activities.

The 15 minute in class sessions consisted of instruction modeling, definition matching and fill-in-the-blank practice, and assessment. The 10 minute at home sessions consisted of read-aloud opportunities, rote-copying, and card games. After the initial session, the student behavior and academic skill increased as familiarity with the content developed. Students and

parents recognized which activities were the most effective for student learning styles and modified other activities to support individual learning styles.

The analysis of comprehensive scores, scores of spelling and scores of definition matching determined the impact of the application of parental involvement through the completion of at-home activities. The hypothesis stated parental involvement would affect vocabulary acquisition of male, middle school students with ASD. The null hypothesis stated parental involvement would not affect vocabulary acquisition of male, middle school students with ASD. Here are the results of the analysis.

Comprehensive Scores

The data from the comprehensive scores identified the receptive and productive vocabulary acquisition of each student. A comparison of the pre-test (M = 16.50) and the post-test (M = 25.55) mean scores identified a significant increase in the means. The null hypothesis was rejected based on the t-test *p*-value (.000). This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Therefore, the slight increase was an attribute of increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies. A significant improvement in comprehensive scores from the pretest to the posttest was recorded; this included both the spelling and definition matching sections. Overall, the activities related to vocabulary acquisition through the course of the week both at home and in the classroom proved effective.

Student Participant Scores. Significant improvements in comprehensive scores from the pretest to the posttest for Participants A, B, D, and E were recorded.

Student A. A comparison of Student A's pre-test (M = 11.88) and post-test (M = 25.88) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Based on the t-test p-value of (.000), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for vocabulary acquisition.

Student B. A comparison of Student B's pre-test (M = 14.75) and post-test (M = 21.63) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Based on the t-test p-value of (.001), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for vocabulary acquisition.

Student C. A comparison of Student C's pre-test (M = 31.75) and post-test (M = 32.38) mean scores identified a weak relationship. This indicates that the vocabulary strategy did not have an effect on students' acquisition of vocabulary. Based on the t-test p-value of (.230), the null hypothesis was accepted. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was not effective for vocabulary acquisition. Participant C demonstrated a higher level of understanding on the pretests; therefore, Participant C did not have as much opportunity for improvement available in the posttest.

Student D. A comparison of Student D's pre-test (M = 8.88) and post-test (M = 16.75) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Based on the t-test p-value of (.010), the null

hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for vocabulary acquisition.

Student E. A comparison of Student E's pre-test (M = 15.25) and post-test (M = 31.13) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Based on the t-test p-value of (.000), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for vocabulary acquisition.

In addition, when considering data from all eight weeks of the study, a strong relationship was discovered between the comprehensive pretest and posttest scores. Overall, as pretest scores increase, posttest scores also increased. This relationship could be explained by student understanding of the content prior to its introduction. If students already had a high level of understanding of the target vocabulary words, students would be required to learn fewer words through the course of the week. If students had less exposure to the target words prior to the pretest, students would be required to learn more words through the week. The following section analyzes data from the scores of spelling.

Scores of Spelling

The data from the spelling scores identified the receptive vocabulary acquisition of each Student. A comparison of the pre-test (M = 6.15) and the post-test (M = 12.43) mean scores identified a significant increase in the means. The null hypothesis was rejected based on the t-test p-value (.000). This indicates that the vocabulary strategy had an effect on students'

acquisition of vocabulary. Therefore, the slight increase was an attribute of increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies. Considering data from all eight weeks of the study, a significant improvement in scores from the pretest to the posttest within the spelling section of the assessment was recorded. Overall, the activities related to spelling the target words correctly proved effective.

Student Participant Scores. Significant improvements in scores from the pretest to the posttest within the spelling section of the assessment for Participants A, B, D, and E were discovered.

Student A. A comparison of Student A's pre-test (M = 3.00) and post-test (M = 12.28) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of receptive vocabulary. Based on the t-test p-value of (.000), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for receptive vocabulary acquisition.

Student B. A comparison of Student B's pre-test (M = 6.13) and post-test (M = 11.50) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of receptive vocabulary. Based on the t-test p-value of (.001), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for receptive vocabulary acquisition.

Student C. A comparison of Student C's pre-test (M = 15.63) and post-test (M = 16.00) mean scores identified a weak relationship. This indicates that the vocabulary strategy did not

have an effect on students' acquisition of receptive vocabulary. Based on the t-test p-value of (.175), the null hypothesis was accepted. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was not effective for receptive vocabulary acquisition. Participant C demonstrated a higher level of understanding on the pretests; therefore, Participant C did not have as much opportunity for improvement available in the posttest.

Student D. A comparison of Student D's pre-test (M = 0.75) and post-test (M = 4.75) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of receptive vocabulary. Based on the t-test p-value of (.012), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for receptive vocabulary acquisition.

Student E. A comparison of Student E's pre-test (M = 5.25) and post-test (M = 15.50) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of receptive vocabulary. Based on the t-test p-value of (.000), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for receptive vocabulary acquisition.

In addition, when considering data from all eight weeks of the study a moderate relationship was discovered between the pretest and posttest scores of spelling. Overall, as pretest scores increase, posttest scores also increase. The following section analyzes data from the scores of definition matching.

Scores of Definition Matching

The data from the definition matching scores identified the productive vocabulary acquisition of each student. A comparison of the pre-test (M = 10.35) and the post-test (M = 13.13) mean scores identified a significant increase in the means. The null hypothesis was rejected based on the t-test p-value (.000). This indicates that the vocabulary strategy had an effect on students' acquisition of vocabulary. Therefore, the slight increase was an attribute of increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies. Considering data from all eight weeks of the study, a significant improvement in scores from the pretest to the posttest within the definition matching section of the assessment was recorded. Overall, the activities related to defining the target words correctly proved effective.

Student Participant Scores. A significant improvements in scores from the pretest to the posttest within the definition matching section of the assessment for Participants D and E was discovered.

Student A. A comparison of Student A's pre-test (M = 8.88) and post-test (M = 11.50) mean scores identified a weak relationship. This indicates that the vocabulary strategy did not have an effect on students' acquisition of productive vocabulary. Based on the t-test p-value of (.103), the null hypothesis was accepted. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was not effective for productive vocabulary acquisition. This could be because many of the words were abstract and, as indicated by Parent A, Participant A found abstract words inaccessible in a visual form to be too difficult to comprehend.

Student B. A comparison of Student B's pre-test (M = 8.63) and post-test (M = 10.13) mean scores identified a moderate relationship. This indicates that the vocabulary strategy did not have an effect on students' acquisition of productive vocabulary. Based on the t-test p-value of (.051), the null hypothesis was accepted. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies strategy was not effective for productive vocabulary acquisition. This could be because, as indicated by Parent B, the biggest struggle with Participant B through the course of the weekly activities was keeping him engaged and therefore, he may not have retained the necessary content.

Student C. A comparison of Student C's pre-test (M = 16.13) and post-test (M = 16.38) mean scores identified a weak relationship. This indicates that the vocabulary strategy did not have an effect on students' acquisition of productive vocabulary. Based on the t-test p-value of (.360), the null hypothesis was accepted. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was not effective for productive vocabulary acquisition. Participant C demonstrated a higher level of understanding on the pretests; therefore, Participant C did not have as much opportunity for improvement available in the posttest. Participant C again demonstrated a higher level of understanding of the target words' definitions on the pretests; therefore, Participant C did not have as much opportunity for improvement available in the posttest.

Student D. A comparison of Student D's pre-test (M = 8.13) and post-test (M = 12.00) mean scores identified a strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of productive vocabulary. Based on the t-test p-value of (.020),

the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for productive vocabulary acquisition.

Student E. A comparison of Student E's pre-test (M = 10.00) and post-test (M = 15.63) mean scores identified a very strong relationship. This indicates that the vocabulary strategy had an effect on students' acquisition of productive vocabulary. Based on the t-test p-value of (.000), the null hypothesis was rejected. Therefore, the data seems to indicate that the increased parental involvement through the implementation of read-aloud opportunities, rote-copying, and card playing strategies was effective for productive vocabulary acquisition.

In addition, when considering data from all eight weeks of the study a moderate relationship was discovered between the pretest and posttest scores of definition matching. Overall, as pretest scores increase, posttest scores also increase. The following section addresses the relationship between on/off task behavior and pretest/posttest scores.

On/Off Task Behavior and Pretest/Posttest Scores

When considering data from all eight weeks of the study, on task behavior tended to result in higher test scores than off task behavior ($r_{pb} = .20$, $p < .05$) during the pretest, although a significant relationship between improved pretest scores and on task behavior was not recorded. Therefore, participant attention to the assessment would not greatly benefit the items participants marked correctly on the pretest. The weak correlation was attributed to the lack of content knowledge on the vocabulary list participants possessed at the beginning of each week. However, on task behavior tended to result in higher test scores than off task behavior ($r_{pb} = .50$, $p < .05$) during the posttest, therefore a significant relationship between improved posttest scores

and on task behavior was recorded. Overall, the more participants attended to the assessment, the more items they would record correctly. The following section addresses data collected from parent participants.

Parental Data

When considering information received from parent data, many positive responses to the games assigned each week were recorded. Of the parents, 80% considered one or both games to be the most effective strategy implemented at home. Parents utilized the games outside of the required two days and found additional ways to apply the cards to at home activities in an attempt to encourage vocabulary acquisition. Of the parents, 20% considered the verbal definition read aloud to be the most effective strategy implemented at home. In this instance, the participant struggled with the concept of matching due to a history of understanding matching in the literal sense of two items being the same.

Of the parents, 20% found the presence of abstract words to be the primary concern of the study. Of the parents, 20% found the lack of repetition of words through the course of the eight weeks to be the primary concern of the study. Of the parents, 20% found the matching definition game to be the least effective strategy of the study; this concern came from the same parent that indicated her participant struggled with the concept of matching items not identical. Of the parents, 20% found the word matching game the least effective strategy of the study. Of the parents, 20% found the study to be without flaws at the end of the eight weeks.

The most important information obtained from the parent data was that each participant learned in different ways. Each parent made different modifications to suit their student's needs in attempts to help them achieve success. The researcher found this knowledge invaluable.

Parents understood their student's strengths and weaknesses, drew from prior knowledge of their student's experiences, and adjusted activities accordingly. In addition, the researcher noted predetermined activities alone were not successful without parental input. Had parents not made necessary adjustments to help their student achieve success, it was likely that many students would have disengaged and therefore, not have retained the information. The following section addressed the strengths and limitations found in this study.

Strengths and Limitations

Strengths

The researcher considered the implementation of the games to be a strength of the study. Many participants found the games to be an enjoyable, stress-free way to engage in learning activities. Many parents likened the games to puzzles, noting their students favored and often excelled at puzzles. In addition, the researcher determined parent modifications to the home activities were a strength to the study. Parents noted what worked best for their student and tied that knowledge into the activities thereby making the activities as beneficial as possible.

Limitations

A limitation to the study was the sample size. Replicating this study with a larger sample size is recommended. A second limitation to the study may be the small changes made through the course of the study in class. However, the modifications were found to be difficult to avoid. Given the population, the researcher could not adequately predict how the students would respond to the classroom activities. Students with ASD often struggle with engagement and process information differently than a non-disabled child. The goal of the classroom activities was to provide the participants with additional practice with the vocabulary words and

definitions. However, the original activities without modification proved to be too difficult for the participants, and many participants input nonsense or words refused to complete the activities. By modifying the activities, participants were more willing to fully attend to the content and provide their best response. Therefore, participants received the full benefit of the activity instead of pushing through without considering the content. The following section addressed researcher's recommendations to meet the needs of the participants both at home and school, in addition to connections with the Common Core State Standards.

Recommendations

Future researchers should consider the following recommendations in order to increase the effects of parental involvement on vocabulary acquisition of middle school students with ASD.

1. Future study may consider the exploration of additional vocabulary games such as pairing the target words/definitions with visual representations or categorizing target words with examples that improve or offer additional insight on the effect of comprehension development of middle school students with ASD.

2. Future study may consider the exploration of two player vocabulary games that allow for an increase of parental involvement and social skill development of middle school students with ASD.

3. Future study may consider expanding the population size to include females to offer a more accurate representation of middle school students with ASD.

Connections to Wisconsin State Standards

With the continued implementation of the vocabulary acquisition strategies and the recommendations, students will be able to increase the complexity of the words and rate introduced gradually. Students will meet the Common Core Essential Elements aligned to this study with the continued implementation of these strategies.

As students become more familiar with the routine, instructors could expand the word list to include material under the English Language Arts' Language category related to standards EE.L.6/7/8.10, which requires students be able to understand all facets of a word including multiple meanings and the compound or complex use of the word. This would add an optional level of complexity to students finding high levels of success with techniques already in place.

Instructors could expand activities related to the vocabulary acquired to meet standards EE.SL.6/7/8.1 from the Essential Elements English Language Arts' Speaking and Listening category, which includes the provision of contribution to classroom discussions, by including opportunities to gain points when utilizing acquired vocabulary words during discussion opportunities.

Instructors could assign activities to support standards EE.W.6/7/8.1, EE.W.6/7/8.2, and EE.W.6/7/8.3 from the Essential Elements English Language Arts' Writing category, which include writing about topics, writing about personal experiences, or writing to share information. Instructors could assign students to use a minimum of three words from their weekly word list to write on a given topic, an activity that would increase student awareness of how to better use vocabulary within context. The following section concluded the study and provided responses to the research questions initially posed by the researcher.

Conclusion

The researcher first questioned what the most effective strategy used by parents to increase performance on weekly vocabulary assessments was. Considering the feedback provided by parents, the most effective strategy overall was the implementation of the games. The majority of parents and participants appeared to enjoy the games and found the games' likeness to puzzles to be familiar and appealing.

The researcher also questioned what the most effective strategy used in the classroom to increase vocabulary acquisition was. The definition matching activity was the most effective strategy. The students struggled with utilizing the words in context, and did not pay as much attention to the fill-in-the-blank activity. The researcher recommended providing more hands on opportunities to utilize the words in context, such as role-playing opportunities or providing points when students use the words correctly within unrelated classroom discussions, as mentioned. In addition, the researcher recommended more modeling of using the words in context by the instructor followed by acknowledging the use of the word. The fill-in-the-blank activity might require more practice with the words to be a successful tool. The definition matching activity, however, contained familiar content that the students had reviewed at home the previous night. Students were more comfortable completing this activity and therefore received the benefit of the additional practice the activities originally intended to provide.

After consideration of all data collected and interpreted through this study, the researcher rejected the null hypothesis, which stated that there would be no increase in vocabulary acquisition of male, middle school students with ASD. Parental involvement increased vocabulary acquisition of male, middle school students with ASD in receptive and productive vocabulary acquisition.

References

Adamski, A., Fraser, B.J., & Peiro, M.M. (2013, April 5). Parental involvement in schooling, classroom environment and student outcomes. *Learning Environments Research, 16,* 315-328. Doi: 10.1007/s10984-012-9121-7

Boyd, B. A., McDonough, S. G., Rupp, B., Khan, F., & Bodfish, J. W. (2011). Effects of a family-implemented treatment on the repetitive behaviors of children with autism. *Journal of Autism and Developmental Disorders,* 41, 1330-1341. doi: 10.1007/s10803-010-1156-y

Dada, S., & Alant, E. (2009, Februrary). The effect of aided language stimulation on vocabulary acquisition in children with little or no functional speech. *American Journal of Speech-Language Pathology*, *18*(1), 50-64.

Gentry, J. (2007). ZB spelling connections. Columbus, Ohio: Zaner-Bloser.

George, D.D., & Mensah, D.K.D. (2010). Parental involvement in home work for children's success. A study in the Cape Coast municipality. *Academic Leadership, 8*(2).

Howrey, J., & Quinn, K. (2014, January). Assessing student attitudes to moodle versus print materials for L2 vocabulary acquisition. *International Journal of Information and Education Technology, 6*(1), 11-16. doi: 10.7763/IJIET.2016.V6.650

Kelly, A.B., Garnett, M.S., Attwood, T., & Peterson, C. (2008, April 25). Autism Spectrum s ymptomatology in children: The impact of family and peer relationships. *Journal of Abnormal Child Psychology, 36,* 1069-1081. doi: 10.1007/s10802-008-9234-8

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

Orawiwatnakul, W. (2011, January). Impacts of vocabulary acquisition techniques instruction on students' learning. *Journal of College Teaching and Learning, 8*(1), 47.

Vacco, L. (2002). Evaluating the collaborative efforts of teachers and parents of children with autism spectrum. *Honors Projects.* Paper 52.

Wachtel, K., & Carter, A. S. (2008). Reaction to diagnosis and parenting styles among mothers of young children with ASDs. *Autism, 12*(5), 575-594. doi: 10.1177/1362361308094505

Walters, J. & Bozkurt, N. (2009). The effect of keeping vocabulary notebooks on vocabulary acquisition. *Language Teaching Researcher, 13*(4), 403-423.

Wei, W. S., & Attan, A. (2014). Comparing intentional vocabulary learning strategies of rote-copying versus read-plus. *3L: The Southeast Asian Journal of English Language Studies, 20*(2), 67-80.

Wisconsin Department of Public Instruction. (2014). *Common Core Essential Elements English Language Arts*. Madison, Wisconsin: Author.

Wisconsin Department of Public Instruction. (2014). WISEdash. Retrieved from http://wisedash.dpi.wi.gov/Dashboard/portalHome.jsp

Appendix A

WEEK #7

1. unlucky
   - not lucky

2. review
   - to study again

3. preschool
   - a place of learning before elementary school

4. unfair
   - not fair

5. reheat
   - to heat again

6. prepay
   - to pay before

7. untie
   - to loosen something that has been tied

8. recover
   - to get back

9. preview
   - to watch in advance

10. unhappy
    - not happy or sad

11. rewrite
    - to write again

12. pretest
    - a test given before to find out readiness

13. rebuild

- to build again

14. uncover
    - to reveal

15. preheat
    - to heat before

BONUS

- refresh
    - to make fresh again
- unknown
    - not known or strange

Appendix B

Name: _____ **Date:** _____

Spelling Test

1.
2.
3.
4.

5.
6.
7.
8.
9.
10.
11.
12.
13.
14.

15.
BONUS
*
*

Name: _____ **Date:** _____

Definition Matching

16. unlucky
    - a measure of the heaviness of an object
    - not lucky
    - we have

17. review
    - humor
    - toward the west
    - to study again

18. preschool
    - a trip with many visits
    - strong
    - a place of learning before elementary school

19. unfair
    - a type of turtle that lives on land
    - not fair
    - not equal

20. reheat
    - to heat again
    - to draw a liner under
    - having to do with kings and queens

21. prepay
    - to pay before
    - a character in a play
    - good

22. untie
    - a law
    - shaped like a ball
    - to loosen something that has been tied

23. recover
    - to prepare and offer food
    - to get back
    - to perceive with the eyes

24. preview

- to search for something
- the back part
- to watch in advance

25. unhappy
    - not often seen
    - not happy or sad
    - logic

26. rewrite
    - to write again
    - a person who gathers news
    - baked goods

27. pretest
    - pitched flute
    - a test given before to find out readiness
    - a human being

28. rebuild
    - to build again
    - a coin worth one cent
    - a small stone

29. uncover
    - something that gives enjoyment
    - helpless
    - to reveal

30. preheat
    - a list of dishes that may be ordered
    - perhaps
    - to heat before

BONUS

- refresh
  - a place where things can be bought
  - to make fresh again
  - an instant

- unknown
  - not known or strange
  - a person who belongs to a group
  - having no love

Name: _____ Date:

_____

Definition Matching Worksheet

31. un_____
    - o a measure of the heaviness of an object
    - o not lucky
    - o we have

32. re_____
    - o humor
    - o toward the west
    - o to study again

33. pr_____
    - o a trip with many visits
    - o strong
    - o a place of learning before elementary school

34. un_____
    - o a type of turtle that lives on land
    - o not fair
    - o not equal

35. re_____
    - o to heat again
    - o to draw a liner under
    - o having to do with kings and queens

36. pr_____
    - o to pay before
    - o a character in a play
    - o good

37. un_____
    - o a law
    - o shaped like a ball
    - o to loosen something that has been tied

38. re_____
    - o to prepare and offer food
    - o to get back
    - o to perceive with the eyes

39. pr_____
    - o to search for something
    - o the back part
    - o to watch in advance

40. un_____
    - o not often seen
    - o not happy or sad
    - o logic

41. re_____
    - o to write again
    - o a person who gathers news
    - o baked goods

42. pr_____
    - o pitched flute
    - o a test given before to find out readiness
    - o a human being

43. re_____
    - o to build again
    - o a coin worth one cent

- a small stone

44. un_____
    - something that gives enjoyment
    - helpless
    - to reveal

45. pr_____
    - a list of dishes that may be ordered
    - perhaps
    - to heat before

BONUS

- re_____
    - a place where things can be bought
    - to make fresh again
    - an instant

- un_____
    - not known or strange
    - a person who belongs to a group
    - having no love

1. unlucky
2. review
3. preschool
4. unfair
5. reheat
6. prepay
7. untie
8. recover
9. preview
10. unhappy
11. rewrite
12. pretest
13. rebuild
14. uncover
15. preheat
16. refresh

17. unknown

Appendix D

Name: _____ Date: _____

Fill-in-the-Blank Worksheet

1. You must pr_____ before you can pump gas in a car.

2. We take a pr_____ every Monday to see which spelling words we already know.

3. You should re_____ last night's supper and have it for lunch today.

4. If a tornado hits your home, you may have to re_____ it.

5. The pirate was able to un_____ the buried treasure.

6. You must pr_____ the oven before putting food in it.

7. You may have to re_____ your computer screen if it is not working.

8. If you write messy, you may have to re_____ your work.

9. The effects of the medicine are un_____ at this time.

10. It is considered un_____ to break a mirror or walk under a ladder.

11. You should re_____ for the tomorrow's test.

12. The three year old girl went to pr_____ to learn her alphabet.

13. It is un_____ to cheat when you play a game.

14. The boy had to un_____ his shoes before removing them.

15. I was able to re_____ my lost wedding ring.

16. I liked the movie pr_____, so I will go see it when it comes out.

17. I am feeling un_____ because my dog is sick.

1. unlucky
2. review
3. preschool
4. unfair
5. reheat
6. prepay
7. untie
8. recover

9. previe
w
10. unhapp
y
11. rewrit
e
12. pretes
t
13. rebuil
d
14. uncove
r
15. prehea
t
16. refres
h
17. unknow
n

Appendix E

Date: _____

STUDENT	**ON TASK** • looking at the instructor or assessment • sitting quietly • writing answers	**OFF TASK** • students looking away from the instructor or the assessment • talking during the assessment • perseverating
A		
B		
C		
D		
E		
F		
G		

H		
I		
J		

Appendix F

Parent Interview

Name: _____

- **Week 1 Parent Interview – Date: _____**
    - Did you receive the vocabulary word list and the letter of daily vocabulary activities to do at home?

    - Did you get the chance to read the letter?

- Do you have any questions regarding the letter or the daily activities?

- **Week 4 Parent Interview – Date: _____**
  - How have the daily vocabulary activities been going?

  - Do you notice anything that is really working? Can you explain why you feel that way?

  - Do you notice anything that is not working? Can you explain why you feel that way?

- Do you have any questions?

- **Week 8 Parent Interview – Date: _____**
  - What do you feel was the most effective vocabulary acquisition strategy? Can you explain why you feel that way?

  - What do you feel was the least effective vocabulary acquisition strategy? Can you explain why you feel that way?