Playing Vocabulary Games and Learning Academic Language

With Gifted Elementary Students

by

Carolyn Mae Ragatz

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved March 2015 by the
Graduate Supervisory Committee:

David Lee Carlson, Chair
Elisabeth Gee
Jill Stamm
Richard Cash

ARIZONA STATE UNIVERSITY

May 2015

ABSTRACT

Learning academic vocabulary is part of the curriculum for elementary students. Many gifted students learn new words easily but do not necessarily feel positive about studying vocabulary at school. They also do not transfer these words to their own writing. This researcher used games in her own fifth-grade classroom to teach vocabulary and measured the use of these words in the students' writing. This study also examined students' attitudes about learning vocabulary through games. This mixed-methods study used quantitative data to study the students' retention of the vocabulary words, their usage of the words in their writing, and their attitude toward playing games to learn vocabulary. The researcher also used qualitative data to measure the students' attitudes toward learning with games. Three different vocabulary games were used and one editing game was used during this 18-week study. Quantitative data from test scores and questionnaire responses were analyzed comparing pre and post responses. Writing samples and word tallies were collected throughout the study. Students learned the definitions of vocabulary words while playing games and retained the meanings after 18 weeks, achieving a mean score on the posttest of 71%. No significant usage of the relevant words in student writing samples was found. Qualitative data from questionnaires and field notes were coded and analyzed. A significant gain was shown in how students felt about studying vocabulary after playing games. This study showed positive results in all areas measured.

ACKNOWLEDGEMENTS

I have had so much support through this incredible learning experience. My husband Phillip has been my champion and cheerleader throughout; when I doubted I could go on, he was always there telling me I could do it. My two fabulous sons studied alongside me. Caleb, you kept me going with your humor; Zach, you discussed the data and made those stats sound exciting. Both of you tell me I'm Super Mom, and that has kept me going more than you know! To the rest of my family and friends, thanks for helping me make it to the finish. There are too many to name, but you know who you are. You make me strong.

I appreciate the mentoring I have received from all of my committee members, each helping me in different ways. To my committee chair, Dr. David Carlson, thanks for starting me toward this topic to begin with and the many interesting threads of conversations to follow. Dr. Betty Gee, you turned me on to looking at video games in a new way. My students and family thank you as well. Dr. Jill Stamm, you have reconnected me to my love of brain research. I hope we can meet up at a brain conference soon. Dr. Richard Cash, may this be the beginning of many more ventures on behalf on gifted students and exciting teaching and learning.

To my colleagues in the schools where I have taught these past 5 years, I appreciate you. You have patiently listened to me explain, complain, relate, and commiserate about this process, most of which you know nothing about. Thank you for your patience and willingness to listen anyway. Thank you for your support and

encouragement as I have undertaken this journey, not for any requirement, but for my own learning.

Finally, I thank my students. You are enthusiastic learners, ready to embrace whatever experience I may throw your way. The new, the unique, the different, you want to try it all. This is the reason I return to the classroom door each year, to try something new, once again.

TABLE OF CONTENTS

Page

CHAPTER Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER 1

INTRODUCTION AND CONTEXT

A classroom should be an exciting place for learning, a place where students want to come and spend their time and where teachers plan lessons that will motivate their students to achieve. In 2001 No Child Left Behind became law, and the standards-based movement of education began. Objectives, test scores, and other types of data became more emphasized, and much of the fun and games in the classroom may be removed as a result. Is teaching with games, either computer games or a more traditional style like Bingo, just fun and games? Can students learn at the same time? More importantly, is it better to teach with games because students will be more engaged and therefore retain more of the material? These are just a few of the questions I posed as an elementary classroom teacher.

I began my teaching career in 1987, teaching in a regular education classroom of mixed ability fourth-grade students in Southern California. During the first 8 years of my career, my classes always contained 35 students, including English Language Learners, Special Education Students, and Gifted Learners. With such a diverse group of students, I found it necessary to employ a variety of teaching strategies. I found early on that using games kept students engaged in what they were learning. I started using Bingo games to drill vocabulary and math facts, as well as other types of math games. Earlier, as a college student tutoring struggling elementary children, I created board games to help them learn various skills. Games have always been a part of my teaching methods.

By the early 2000s, I had been a classroom teacher for more than a decade and had witnessed many changes in my classroom and within the field of education. Students seemed to have shorter attention spans and to need more action to stay focused. This was becoming the video/instant generation, and their style of learning and acquiring information seemed to be different. Although there were many changes in schools, I had always used games as part of my instruction, and after reading about some of the issues facing boys in schools, specifically Michael Gurian's (2003) work *Boys and Girls Learn Differently,* many ideas began to form my approach to teaching. Key to this new approach was that most boys flourish in competitive environments. Moreover, Gurian's work indicates that boys need more movement or kinesthetic learning and that more social interaction helps many boys learn. Although I had always used games, I now began a more thoughtful approach to their use, carefully aligning them with the curriculum. According to Gurian, this measure would help not only the boys in the classroom but also the girls (pp. 192-194). The types of games that I am referring to are traditional, nondigital games like Bingo, or those involving dice or cards. These classroom games often incorporate teamwork and social interaction.

Currently in education when a person mentions games, he or she is usually referring to video games. Although video games certainly have their use, they are not always practical for a classroom teacher. Many classrooms tend to have few computers, not enough for an entire class of students to use computers at once. If the school has a computer lab, that time is limited and teachers must use it for curricular areas such as research, writing, and test taking. Many thought-provoking and problem-solving types of

computer games are time consuming and cannot be easily fit into the already full school day. Finally, many district computer servers block any site that has the word *game* in it, so students cannot even log on to these at school. Even without the use of digital games, there is still a place for games that involve the entire class, allowing the teacher to infuse his or her own curriculum, classmates to interact and compete, and students to enjoy activity and fun. The games in this research study do all of this and do not even require a lot of special equipment.

As I spent more time developing games to meet my students' needs, I started to look at games in general. I began to see the overall enjoyment and engagement that different people had playing games. I saw that whether they were my students at school during math, my family at home on a video consul, or my friends camping, they all shared a similar focus and enthusiasm. The primary research on games in the last 10 years seems to be on video games, or on games in one subject area or for a special population of students. Therefore, traditional classroom games was an area worth studying, and one that had not been investigated with gifted students, who seem to love games.

As a new teacher in California, I had no special training for teaching gifted students; yet there I was with some in my classroom and teaching an enrichment class for this special group each year. I became interested in learning more about them, so I attended conferences and earned a certification from the California Association for the Gifted. I eventually became a full-time Resource Teacher for Gifted Education, concentrating on teacher training and program planning for gifted students third through

eighth grade. Upon moving to Arizona, I returned to the classroom to teach in the self-contained gifted classroom, where I have taught third through sixth grade for the past 14 years. I also have two gifted children of my own, so I experience trying to keep them challenged and engaged both at home and at school. This eventually led me back to school to pursue my advanced degree in curriculum, focusing on gifted students.

Gifted children possess a large vocabulary (Webb, Meckstroth, & Tolan, 1982). This unusual vocabulary, setting them apart from their peers, is often one of the first indications that a child should be tested for a gifted program. Gifted children often seem to enjoy learning new words and their meanings; however, they do not tend to enjoy the traditional way they are taught in school. Gifted students want their school day to be filled with work that is interesting, novel (Feldhusen & Moon, 1992; Little, 2012) and fun.

As a researcher, I began to examine ways I could combine my gifted students and my fascination with people and playing games. I have given many workshops at teacher conferences on using games in the classrooms. Although my students happen to be gifted, using games to teach and reinforce concepts is a good strategies for all students. Too often games are left to fill extra time or used as a reward, and I feel they should be purposefully planned into lessons because they add to the curriculum and are not a waste of time.

In my study of the literature, I found that much of the current work is being done on video games. Some of the current trends, such as gamification, using game thinking in non-game situations, and game theory, do not apply to the traditional games that I use in

my classroom. The current generation of students spends a lot of time on electronic devices, yet they still enjoy traditional games, and there are uses and benefits that result from using them in the classroom.

Context

As the researcher for this study, I was an elementary teacher in a suburban school in the southwestern United States. In this school district, the gifted students are identified as students who score in the 97th percentile on one or more sections of the Cognitive Abilities Test (CogAT) (Thorndike, Hagen, & Lorge, 1974). These students are placed in self-contained classrooms, beginning as early as kindergarten in some schools. This means that the students are with the same teacher and students for the duration of their entire core curriculum.

I was also the classroom teacher. The students were in a self-contained, gifted classroom. I used many different games in my class, in all different subjects throughout the year. This strategy made for a very active classroom that was good for all learners.

The focus of this study was not just on students learning the meaning of words but was intended to encourage the students to begin to use these words in their own writing. The students responded to writing prompts seven times during the 18-week study and once at the end of the school year, 22 weeks after the study began. The purpose of these responses was to see whether the students were using their vocabulary words in their own writing. A post-test questionnaire was given at the conclusion of the 18 weeks to assess the students' attitudes regarding the vocabulary games they played and whether they were learning vocabulary.

The purpose of this research study was to determine whether playing games as a whole class in an elementary classroom increased the likelihood that the words would become a part of the students' lexicon and would be used in their classroom writing assignments. The research questions examined during this study were:

1. What effect does playing vocabulary games have on the chosen academic language in students' writing?
2. Does playing vocabulary games increase students' awareness of these words in other literature?
3. What were the students' attitudes toward learning academic language when playing games?

Games are engaging and enjoyable, but do they help students learn? That is what this researcher set out to find in her classroom during one school year.

Chapter 2 contains the review of the literature. In this chapter vocabulary acquisition of elementary students will be discussed. There will be a brief overview of learning and memory and of how transfer of knowledge occurs. The theory of constructivism will be discussed, followed by the topics of student motivation and engagement. Finally and most relevant to this student is the topic of games. The chapter contains a brief look at the work of James Gee and which of his principles can be applied to traditional games. Also some of the video game concepts can be taken and applied to the nondigital game world.

In Chapter 3 the methods of the study will be presented. The researcher will begin by introducing the school and the 19 participants in the study. Next she will explain the four games used and how they relate to learning.

Chapter 4 provides the results of the study. Both quantitative and qualitative measures were used to analyze the data. The majority of the data were gathered during the first half of one school year while these students were under the direct instruction of the researcher. This chapter includes many graphs to assist in summarizing the information.

Finally, Chapter 5 brings forth seven assumptions drawn from the data. The researcher also highlights the limitations of the study and the next steps to be taken. Several conclusions can be drawn, but there is also more work to be done in this area.

CHAPTER 2

REVIEW OF THE LITERATURE

This study involved the researcher and 19 of her gifted fifth-grade students during one school year. The students studied vocabulary taken from their literature book, *A Wrinkle in Time* by Madeleine L'Engle (1962). They were introduced to the meanings of the words within the context of the story using student-made vocabulary cards. Once they had made these cards, the students participated in four different types of leaning games to reinforce the meanings and further help them remain engaged in the learning. One of these games also helped them practice the use of these words when editing. The final part of the study was conducted to discern whether use of these words would transfer to the students' writing.

In this literature review, first, vocabulary acquisition will be examined—specifically, the connection between reading and vocabulary in upper elementary learners. The next area of study is transfer of learning; this is a difficult area to measure. It occurs when a student learns a skill is in one subject area and carries that skill over to another. Constructivism is an important theory in education and drives many of the choices that teachers make regarding how they will structure their classrooms. Keeping students motivated and engaged in their learning is another area worth examining and incorporating into good teaching. Finally, this literature review will examine the research on games. Much of this work is conducted using video games rather than traditional games like the ones used in this study. The intent behind this research study is to fill this gap in the literature.

Vocabulary Acquisition

Students in elementary school learn an amazing number of words a day, anywhere from two to eight depending on their ability level. This difference could affect future learning and educational success for that child (Baker, Simmons, & Kame'enui, 1995). Vocabulary knowledge is directly linked to reading comprehension. Those who are better readers also have greater vocabulary knowledge (Baker et al., 1995). Vocabulary is important when learning how to read (Biemiller, 2005; National Reading Panel, 2010). It is through reading that learners acquire new words. Even though these two skills are linked, specific instruction in word meaning is needed for deeper understanding. The more times a reader comes in contact with a word, the more apt he/she is to understand it when he/she sees it again (Nagy, 2005). Several different teaching strategies for vocabulary acquisition have been studied, including mapping, keyword, computer assisted, and all were equally successful (Baker). It is the purposeful instruction of words and their meanings within the context of usage that is important to learning. The National Reading Panel conducted an analysis of 324 research studies completed from 2002 to 2009 concerning the topic of vocabulary instruction. The synthesis of this research identified eight important findings. Two concluded that vocabulary instruction should include repetition and multiple experiences with the words and that vocabulary learning is effective when it involves active engagement (NRP, 2010). The use of vocabulary games to learn meanings of words incorporates both of these important findings. The use of these game is appropriate for all types of learners.

Learning and Memory

Every classroom is filled with a variety of learners. Accommodations are often made for students who cannot keep up with the pace of the regular curriculum, but often nothing is done for those who move more quickly than the average learners. Scanning the brain using a positron emission tomography scans (PET) or functional magnetic resonance scans (fMRI) while a person is being exposed to a novel experience is one way to achieve a better understanding of how learning is happening. Several of these studies have been conducted using brains of different types of learners. The brains of gifted people can make the transitions from novelty to routine in less time and with fewer exposures than can those of average individuals (Sousa, 2009). Cohn, Carlson, and Jensen (1985) also found that gifted students process information more quickly than average learners. What this means in the classroom is that gifted students do not need the same amount of repetition that other students do for the same learning to occur. Learning occurs at different rates, and therefore instruction should as well. Once the initial learning occurs, how does it transfer to new situations?

Transfer of Learning

Transfer of learning involves the ability to take that which is learned in one context and use it in another, although there is still debate regarding exactly what it is and when it occurs (Barnett & Ceci, 2002). Transferring learned skills is one of the primary goals of education (Butterfield & Nelson, 1989). Marini and Genereux (1995) define it as "prior learning affecting new learning or performance" (p. 2). Transfer of learning is difficult to test because it is embedded into other experiences that often happen years

after the initial learning takes place. Trying to pinpoint the exact moment that a particular skill was used or how it was manifested in a new situation is challenging for a teacher or researcher. For example, in the classroom, students often learn vocabulary as a part of their curriculum. These new words could be part of a literature unit, or acquired during social studies or science. Quite often students learn new words so that they can better understand what subject is being studied or to pass the end-of-unit test. A better focus would be on the new words' becoming a part of the students' own everyday vocabularies so they would begin to use them in their own writing and speaking, even outside the classroom. This would mean that the vocabulary learning had transferred to a new situation. Osgood (1949) found in his early work on transfer theory that the more closely the stimuli resembled the real world, where the students would eventually use it, the more likely it was that it would transfer later. Transfer will also be more likely if it is linked to prior knowledge (as cited in Butterfield & Nelson, 1989). Therefore, teaching vocabulary merely to allow students to memorize the meaning of words so they could pass a test would probably not result in the students' beginning to use these words in their own speaking and writing. Educators who connect vocabulary instruction to other experiences adopt the constructivist theory of learning.

Constructivism

Constructivists believe that meaning should come out of experiences, not be thrust upon the learner. New information is connected to previous learning, and learners make those connections themselves (Ertmer & Newby, 1993). Some of the important founders and proponents of constructivism were John Dewey, Jean Piaget, and Lev Vygotsky

(Driscoll, 2005). As the name *constructivism* implies, the theory assumes that knowledge is constructed using critical thinking and reasoning. Constructivism requires active learning, and in classrooms teachers often center their lessons around problems that need to be solved. Each student brings his or her own experiences and knowledge to the problem in an attempt to solve it. For learning to happen, it must include practice, concept, and context. The learner must be involved in authentic, meaningful tasks. New information is also sought by the learner in an attempt to come up with the best solution. If students cannot come up with meaning on their own, they have others to model the construction of meaning for them, or they are coached to be brought to expert performance (Driscoll, 2005). Games can provide this type of active learning; not only are they constructivist in nature, but games are also highly motivating and engaging to students.

Motivation/Engagement

One key to student learning is motivation. If students do not want to learn, their disinterest will affect how they approach the lessons being taught. Teachers in the classroom know that students who are engaged in their learning will perform better in their classwork. Even with this practical knowledge, it has been difficult for researchers to replicate those findings (Uguroglu & Walberg, 1979). Gifted students are more engaged with their learning when it is challenging, interesting, creative, and novel and when it involves choice (Adams & Pierce, 2006; Clark, 1997; Maker, 1986; Renzulli, Smith, & Reis, 1982; Van Tassel-Baska, 1989). Students need a combination of extrinsic

motivation, or that which comes from the outside, and intrinsic motivatioin, the internal desire to learn; these are dependent on one another (Cash, 2011).

One of the characteristics of gifted students is that they have a large vocabulary (Webb, Meckstroth, & Tolan, 1982; Clark, 1997). They often also have an interest in learning new and unusual words. As these students acquire new language, teachers find it a challenge to come up with ways to get them to use those words in their writing. Of all students in the classroom, the members of this unique group should be the ones motivated to use new, more interesting words to improve their overall writing compositions. However, the challenge for the teacher is to find the proper motivation. There are many innovative ways to motivate students in a classroom, and one of these is through the use of games.

Games

What is a game? A game is made of rules with common objectives or goals and feedback (McGonigal, 2011; Salen & Zimmerman, 2004). They are silly; they are fun. Playing games can be an effective way for groups to build comradeship, and games have been used for this purpose for many years. Traditional games, such as chess and Monopoly; sports, such as baseball, football, or golf; are card and computer games of all sorts are all very popular among the general public. Jane McGonigal (2011) discussed some unique games in her book *Reality Is Broken.* Computer games offer a wide range of entertainment and skill development, including problem solving, teamwork, task commitment, and creativity (Squire, 2011). Games have been around since the beginning of time; ancient civilizations played games using bones and rocks. Why do human beings

like games so much? Games are fun and engaging. When games are used in conjunction with learning, that learning also becomes fun and engaging. Games have an inherent structure that gives participants experiences that keep them coming back for more.

McGonigal (2011) makes a case that everyone needs to be playing all kinds of games. She states that there are four basic cravings or intrinsic rewards that games help to meet: satisfying work; success; social connections; and meaning, the chance to be part of something bigger than ourselves. Games do not bring about anything tangible, but they do provide an intrinsic reward that keeps people of all ages coming back for more. Another term she brings up is *naches*. This is something certainly seen in the video gamer world. It is the vicarious pride that arises from playing over someone's shoulder. It is why one person will play a console game, such as *Mario Brothers,* on the Wii, and three people will stand behind him/her, twitching and giving advice as well as groaning and cheering, as the game is played. Maybe it is part of the brain's mirror neuron system, that part of the brain that feels empathy when one person watches another do something and feels as if he/she is doing it too, similar to the "armchair quarterback" for Monday Night Football. These naches are seen not only in living rooms and now anywhere children can gather with a handheld game, but also in words on Internet fan sites and blogs. Players give each other advice on how to beat bosses and levels, and it does not matter if the expert is older or younger than the novice. This age difference does not matter; all that matters is the experience and success of the player. A similar behavior is seen in a classroom when a board game or skill game is being played.

A pioneer in the work of game theory is James Paul Gee. As a linguist, he began by looking at the language of games and how that could be applied to learning. In his book *What Video Games Have to Teach Us About Learning and Literacy* (2007), Gee outlines 36 principles that are found in video games and that could consequently change education. Some of these principles also apply to more traditional, nondigital games. One of the most important of Gee's principles is #1 Active and Critical. When learning is passive, it is easy for the student to tune out and for none of the lesson's important information to actually make it to the student. Everything about a good game requires that the player be actively involved. Games also involve critical thinking and problem solving. Gee's principles #6 and #8 have to do with choice and risk. Problems within a game involve choices that the gamer must make that usually involve some sort of risk. This risk is lower than it would be in the real world, but it adds an element of interest and excitement to the game that keeps the player (learner) engaged (Gee, 2007). Squire (2011) also discussed the fact that games teach critical thinking, problem solving, systematic thinking, risk taking, and making choices that have consequences. In the current high-stakes-testing environment of schools, classrooms have become a world of regurgitating facts instead of an exciting place to solve problems. Games are an enjoyable and effective way to learn anything, as gamers are learning through play.

Little empirical research has been conducted using nondigital games in the classroom, and most of what has been conducted is in the area of math. One recent study using math games for instruction found a minor positive effect in children's learning of math concepts when using math games (Bragg, 2012). Nisbet and Williams (2009) also

studied using games of chance with math students. Part of this study examined the students' attitudes while learning. Nisbet and Williams found that the students' attitude towards learning about chance in math improved while they played games. One study conducted in Sweden (Sandberg, 2009) investigated teachers' views on play at school in general. Some teachers who participated in this study did mention using games for instruction favorably in their interviews.

One of the reasons that games, especially video games, can take so much time and consume players is that they offer significant intrinsic reward. This incorporates Gee's (2007) Principles #11 and #12. Players have a desire for more reward, so they keep playing, thereby getting a great deal of practice. Games also have the learner operating just on the outer edge of his or her resources (Gee, 2007). Gee also discusses how meanings are learned in games. The player is not given a list of rules and symbols to memorize before starting the game; in fact, most true gamers do not even look at the manual of a new game, instead just diving into the play. A gamer learns everything that is needed, for example terms, actions, symbols, or locations, within the context of the game play, as the information is needed. Even in a traditional game, players will return to read the rules as needed, rather than try to learn them all at once. The game teaches the necessary skill at the relevant time, and then the gamer puts it into practice. If the gamer needs to practice that skill multiple times, then his avatar, the game character he is playing, dies. The player just starts over. It is a redo. Gamers have no problem with this. They do not feel bad, maybe a little frustrated, but more often they are just more determined to try again, possibly in a different way, and to learn from their mistakes.

Unfortunately, when students receive negative feedback in a classroom, they do not approach the "redo" in the same manner. Mistakes in school carry a lot more weight and often are not seen as paths toward learning a skill, but rather as failure, leaving a student wrought with feelings of inadequacy. These feelings make it hard for the student to pick him/herself up and try again. Many gifted students have strong feelings of perfectionism and criticism, and their performance in school is often seen as failure, which can lead to low self-esteem or underachievement (Clark, 1997; Rimm, 1986; Webb et al., 1982). If school were designed with a different focus, maybe the outcome would be different. Gifted children are not usually underachievers in video games. When players are successful, that is when their enjoyment is greatest. Students enjoy games and are motivated by them, but are games effective learning tools in the classroom?

Literature Review Summary and Alignment With Purpose of the Study

The researcher is able to show the importance of direct instruction of vocabulary and the use of games in an elementary classroom. The new Common Core Standards, or Arizona Standards for College and Career, state that teachers must purposefully instruct students in Tier Two Vocabulary, those words that they are apt to encounter in future reading of literature and nonfiction material. If students find this instruction engaging and motivating, they will be more likely to attend to the learning. There are definite gaps in the research in both areas of this study, learning vocabulary and the use of traditional, nondigital games in the classroom. This researcher will contribute to the literature in these areas of study.

CHAPTER 3

METHODS

Methodological Approach

In this study, the researcher investigated using games to teach vocabulary. Three different games were used to help students learn vocabulary in a fun and engaging way. This investigation took place in a self-contained gifted classroom. The use of games is a teaching strategy that is good for all students, not just those who are gifted. The second part of the study was intended to reveal whether students transferred the vocabulary words they learned while playing games to their writing. A fourth game was used to encourage the students in this endeavor. This chapter will outline the research study on using traditional games in the classroom for vocabulary instruction.

In 2011, the researcher conducted a pilot study to investigate the relationship between classroom games and vocabulary. Results of this study indicate that using games in the classroom increased gifted students' learning of vocabulary definitions both in the short term, 5 weeks, and in the long term, 3 months. When learning new skills, the brain transfers the learning from short-term memory, the encoding of the initial memory, to long-term memory. As working memory is becoming a long-term memory, synapses make the connections in the brain that create long-term memories. Repetition and motivation are two behaviors that help create long-term memories (Mastin, 2010) and were two elements present in the pilot study.

This earlier study also emphasized two characteristics of gifted learners. One is their unusually large vocabulary for their age and the other is their ability to learn basic

skills more quickly and with less practice than typical students do (Cohn et al., 1985; Scruggs & Cohn, 1983, Webb et al., 1982). Although these characteristics may have helped the students learn the words quickly and although the students may have even already known some of the words before the study began, once the students learned the definitions of the words from class activities, the words did not become part of the students' lexicon. That is to say that the students did not begin to use these words in their everyday speech or in their writing as observed by the classroom teacher/researcher. The researcher explored the use of games further in the elementary gifted classroom for this study. The researcher tested students to discern the extent to which they used the words after taking the final vocabulary test. The pilot study also revealed that students enjoyed learning the vocabulary using games. Since the pilot study failed to note these occurrences, this study captured those experiences in a formal setting by questioning the students about their attitudes surrounding the studying of vocabulary and noting their responses.

Often, students learn the meaning of new words as they study literature and other subjects such as social studies and science in school. In these subject area contexts, they often learn the definitions of these words as well as what part of speech they are and how to use them in sentences. Students practice writing the words or matching the words to the meanings and are often tested on them at the culmination of the curriculum unit. At that time, the students usually move on to new words, and meanings are stored in their memories but may not be transferred to their daily lexicon. The purpose of this research study was to determine whether playing games as a whole class in an elementary gifted

classroom increased the likelihood that the words would become a part of the students' lexicon and would be used in their classroom writing assignments.

The research questions examined during this study were:

1. What effect does playing vocabulary games have on the chosen academic language in students' writing?
2. Does playing vocabulary games increase students' awareness of these words in other literature?
3. What were the students' attitudes toward learning academic language when playing games?

Using action research and a mixed-methods design, this study investigated the above-mentioned research questions.

Action Research

Participatory action research is found in the various fields of the social sciences. These fields of study comprise the complex nature of human beings and often use a mixed-methods design. Action research can be broken down further into subcategories based on the research question in study. For example, critical action research looks at social injustice, whereas classroom research focuses on inquiry and data that teachers collect to improve their own teaching methodologies (Denzin & Lincoln, 2008). Mixed-method designs are often used because the data give a better understanding of the research questions. Since some research questions cannot be adequately answered with quantitative or qualitative data alone, they therefore require the combined information to gather a complete picture of the research. Education is multifaceted, and a mixed-

methods approach gives the researcher a deeper understanding of varied individuals, for example, boys, girls, students with different learning styles, individuals with various abilities levels, and those coming to school from diverse homes (Greene, 2007). Furthermore, when the classroom teacher conducts action research within his/her own classroom, he or she is likely to find additional avenues of data. When an outside researcher comes into a classroom, he/she can make observations only while present. The classroom teacher has the advantage of recording anecdotal notes at any time during the teaching day. This methodology can be especially beneficial when children are the research participants, because they are spontaneous and will often contribute comments associated with the research at unrelated moments in the school day.

Research Design

Combining the methodological designs of quantitative and qualitative studies results in mixed-methods design. A researcher chooses to use a mixed-methods approach in a study because it will provide something that neither a solely quantitative nor a solely qualitative approach will. A quantitative study focuses strictly on the numbers, testing objective theories and analyzing the relationships between them using statistical measures (Creswell, 2009.) Qualitative studies concentrate on open-ended question responses coded to identify similarities and differences. These studies generally look at human or social problems, focusing on general themes. The research takes on a more flexible structure and the researcher interprets his/her observations (Creswell, 2009.) When using a mixed-method design, it is imperative that the researcher make sure the qualitative and quantitative data work together to answer the research questions. It is this triangulation

that makes this a strong method of data collection and analysis. The two types of data complement each other and strengthen the results (Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005).

This study used a mixed-methods design requiring both qualitative and quantitative measures. Qualitative coding and analysis were applied to the data collected from the questionnaire with open-ended questions and to the field notes taken during the game play and at other times during the school day. The questionnaires also contained question responses requiring quantitative analysis, as did the vocabulary tests, word sightings board, a bulletin board in the classroom to post where the students found the vocabulary words, Wacky Word Race, an editing game, and word prompt responses. The researcher used a Triangulation Design, convergence model (Creswell & Plano Clark, 2011) to compare and contrast data on the same phenomenon after collecting quantitative and qualitative results.

The triangle is the strongest geometric shape and is the basis for the term *triangulation*, which refers to a strong research method. This method offers different ways to examine the same research questions. By using both quantitative and qualitative measures, researchers can be more confident of the result. This multimethod result can better explain a research problem because it comes from different perspectives (Creswell, 2009; Denzin & Lincoln 2008; Greene, 2007; Jick, 1979). Triangulation was used to review the data from the vocabulary tests, the writing samples, the responses from questionnaires, videotapes, and field notes.

Setting

This study took place in a fifth-grade classroom in a suburban school in Southern Arizona with a total student population of 815 students. The students in the school come from a diverse population, with 29% of the students being of non-White origin from five different racial backgrounds and 7% on free or reduced lunch. The school was 7 years old and was located within an upper-middle-class neighborhood. The students mostly lived in single-family homes with an average market value of $325,000. The students in the classroom studied were from this school's neighborhood and were also bussed in from other neighborhoods within a 5-mile radius. This classroom was a self-contained gifted classroom. This means that all the students had been identified as gifted learners as determined by the guidelines set forth by the school district. The student participants remained in this classroom all day for all subjects and were taught by a teacher who received her Gifted Endorsement from the Arizona Department of Education. There were nine of these classrooms at this school site for grades 1–6.

Participants

Researcher. The researcher also served as the participants' full-time classroom teacher. She taught most of their subjects (e.g., math, reading, social studies, etc.) except for physical education and music, and thus had them nearly all day. The researcher had been an elementary teacher for more than 25 years. She began her career in California teaching in a regular classroom with a cluster of gifted students. Having grown up participating in the early years of gifted education in a pull-out program herself, she had always had a good understanding of these students. For the last 2 years of her work in

California, she became the coordinator for the gifted program in her district and was in charge of the identification of gifted students, planning gifted programs, and training teachers for gifted students. It was in this role that she began to deliver professional development for other districts as well as at state conferences. After 2 years in this position, she relocated with her family to Arizona, where she had the opportunity to teach in a self-contained gifted classroom, which she had been doing for the previous 12 years, in grades 3–6, at the time the study was conducted. She has presented workshops at state and local gifted conferences on various topics, including using games in the classroom. She also has two gifted children of her own who attended this same program in different schools in the district. She is an avid champion of gifted education and continues to coach teachers and parents whenever given the opportunity. She has always used games in her classroom in all subject areas as a way to keep students engaged in their learning.

Students. The strategies used in this study are relevant not only for a classroom of gifted students but would be considered good teaching methods for any group of students. This sample of students happens to be a gifted population because that is the group of students that this researcher teaches and to which she had access. However, this special group of students does share some unique characteristics and learning needs.

The 19 students who participated in this study were all fifth graders and part of a self-contained gifted classroom. This means that they were in this class with the same teacher and students all day, every day, for all subjects. In the majority of school districts in Arizona, programs for the intellectual top 5% of the population, or gifted, are usually offered on a pull-out basis or as a cluster program. In a cluster program, the gifted

students spend a day, or part of a day, with other gifted students and a certified gifted specialist for enrichment activities. These are usually special-interest units that are separate from or extensions of the regular curriculum being taught the rest of the time in the students' regular classroom. These units are usually highly engaging, hands-on learning activities that stretch the students' high intellect and invigorate their creativity. Cluster programs are often offered in conjunction with pull-out programs. These programs include clusters of approximately four to six gifted students in a regular classroom with teachers trained in strategies for teaching gifted students. These teachers then differentiate their lessons so that these highly capable students receive different instruction and/or assignments for the same basic curriculum content that the rest of the class is receiving. This differentiation ideally is provided for all subject areas but usually is provided just for math and reading.

In the district in which this study took place, a different philosophy is held. It is believed that since children are gifted all day long, they should be in an environment with others who think as they do for the majority of their learning time. Due to this core belief, this district has always had self-contained gifted classes, where the students spend the majority of the day with their gifted peers. They are taught the regular curriculum but with more depth and complexity. Students are accelerated at least one grade level in math and reading. The teachers of these classrooms all have or are working toward their gifted endorsement from the Arizona Department of Education. Students were identified as gifted using the Cognitive Abilities Test (Thorndike, Hagen, & Lorge, 1974) and qualified at the 95th percentile or above, with most scoring at the 97th percentile or

above. To qualify for this program, students can qualify in only one area—verbal, quantitative, or nonverbal—or on the composite score.

The class studied in this research study was a class of 22 students, out of which 19 agreed to participate in the study. This sample included 10 girls and nine boys. Most of the students have been in a gifted class since at least third grade, although four students began gifted classes in the same year in which this study was conducted. Of these students, Table 1 shows how they qualified for the program.

Table 1

Participant Qualification on CogAT

Number of Students	Area of Qualification
2	Verbal
2	Qualitative
8	Nonverbal
1	Verbal and Nonverbal
4	Qualitative and Nonverbal
2	Verbal, Qualitative, and Nonverbal

The racial breakdown of the study sample was as follows: Thirteen of the students were Caucasian and six were Asian. As far as family makeup was concerned, 16 students lived with both parents married, while three were from divorced parents but had contact with both parents and lived with a step-parent. The students in this class all got along well, and there were no severe behavior problems, other than too much talking and some teasing and picking on each other. One student was diagnosed with Attention Deficit Disorder with Hyperactivity; he had a 504 learning plan for modifications on some

learning tasks but did not receive any other services. One student was diagnosed with Attention Deficit Disorder but did not have a modified learning plan. Many of the students had been in the same class grouping for several years, so they knew each other very well. The teacher and students had a positive rapport, and the classroom was filled with busy, active learning. These students generally enjoyed school and learning. The teacher was new to the school during the year in which the study was conducted and had been moved over from another school in the same district due to a change in staffing needs in the district. Due to the nature of the self-contained gifted program, teachers sometimes must change schools due to the number of students; likewise, students are sometimes bussed from other neighborhoods to fill out classrooms.

Gifted learners. Over the past 150 years, although the description of gifted learners has not changed much, how they are educated seems to bend with the whims of society. Gifted individuals began to be studied as a group in the late 1800s. Hollingworth (1926) wrote the first comprehensive textbook about gifted students, covering everything from identification to social emotional needs and curriculum, as well as issues concerning family and society. While taking into account the cultural changes over time, many of Hollingworth's points and observations about these students remain valid today. Two of these that relate to this study are that gifted students will naturally choose playmates of like intellectual ability, even if this means interacting with older children, and that "nearly all gifted children love to read, and will read anything they can find" (p. 147). Terman (1931) published a five-volume longitudinal study of 1,500 individuals. He found that these students were not like their peers in the way that they learned and that

there was a problem within the school system of identifying these children and serving them (Terman, 1931). Identification of these students continues to be an area of debate. Many districts rely only on test scores for admission to programs even though experts in the field believe that a broader definition of giftedness should be adopted. By limiting participation to only those students who score within the top 3–5% on standardized abilities tests, school programs fail to serve all high ability students (Renzulli, 1982; Rimm, 1984).

The federal government Office of Education (1970) commissioned a study on education of the gifted and talented called *The Marland Report*. It was reported that services that existed for gifted students served only a very small percentage of the identified population. Two other key points were found: (a) often apathy and hostility exist among all levels of educational personnel in regard to the identification of gifted students, and (b) gifted students are deprived and can suffer. Since then, few changes have been consistently made in gifted education. Gifted education is subject to the current trends in the economy, politics, and culture surrounding society (Sayler, 1999). Parents and teachers of gifted students understand the importance of investing in the education of this unique population of student, but most of those who control school mandates and funding do not see it as a vital concern. It is seen as an educational issue that has long-term consequences but is not necessarily an immediate, pressing problem (Gallagher, 2003).

Currently, the National Association for Gifted Children's position paper, "Redefining Giftedness for a New Century (n.d.) defines giftedness as follows:

> Gifted individuals are those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains. Domains include any structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports). (para. 1)

Although there are different descriptions of giftedness that vary slightly in the specific language, those working in the field of gifted education agree on a common premise: that gifted individuals have the highest intellects and are the most talented persons within the general population. Children vary in personality traits, strengths, and weaknesses, yet gifted children share some typical characteristics. Webb et al. (1982), in *Guiding the Gifted Child*, described gifted children as having the following intellectual characteristics, many of which are the same as those that Terman listed more than 50 years prior.

- Unusually large vocabulary for their age
- Ability to read earlier than most children, often before entering school
- Greater comprehension of the subtleties of language
- Longer attention span; persistence and intense concentration
- Ability to learn basic skills more quickly and with less practice
- Wide range of interests
- Highly developed curiosity and a limitless supply of questions
- Interest in experimenting and doing things differently
- Tendency to put ideas or things together in ways that are unusual and not obvious (divergent thinking)
- Ability to retain a great deal of information
- Unusual sense of humor (p. 46)

Clark's (1997, pp. 55-59) list is also very similar, adding what these characteristics might mean for learning in terms of needs and challenges. For example, a child with a larger capacity for knowledge needs to be exposed to many learning opportunities, perhaps more than an average classroom will provide. He/she may also resent the drill of skills that are already known and complain of being bored. These characteristics lead to unique challenges for the learner and for the teacher, especially if the teacher has had no training in the needs of and teaching strategies for gifted students. For example, verbally gifted students may not learn in a different manner, but the rate at which they acquire knowledge may be substantially faster (Cohn et al., 1985; Scruggs & Cohn, 1983), and they are more likely to succeed when curriculum is designed with their needs in mind (Davidson, Davidson, & Vanderkam, 2004; Redding, 1989; Rimm, 1986).

Gifted education does not have the same types of guidelines placed on it as other special populations, such as students with learning difficulties or students for whom English is a second language. These special groups all have federal mandates requiring states to meet the needs of these students. Money is allotted to the programs that provide education for children with these special needs. Although gifted children also have unique learning needs, there are no federal mandates requiring services by school districts, and therefore no money is set aside to provide for these students. It is up to the individual states and districts to determine whether special programs are warranted for these students and to then find a way to fund them. Lacking funding, many districts do not have any programs that meet the educational needs of gifted students. This is one of the reasons there is so much variation across the country regarding how best to meet the

needs of gifted students (Davidson et al., 2004; Karnes & Marquardt, 2003; O'Connell, 2003).

When discussing special populations in education, such as students with learning or other physical disabilities, and those for whom English is not their native language, the gifted learner is often seen as one who does not have a special need. Educators and parents of the gifted students often hear such phrases as "They will be fine without special help," "They learn on their own anyway," or "It is good for them to tutor other children." None of these statements are true. Gifted children need to be challenged or they will become bored and certainly will not strive to reach their full potential. Gifted students whose needs are not met often become underachievers later in school (Davidson et al., 2004; Redding, 1989; Rimm, 1986). All children deserve to have educational experiences that are engaging and help them learn in new and challenging ways. One way to keep these students engaged in their learning is through the competitive, active engagement of games.

Innovation

The students in this study read the 1963 book *A Wrinkle in Time* by Madeleine L'Engle. This book is one of the exemplar text selections from the College and Career Ready Standards used in Arizona. It is a book that all students in this class are able to read and understand independently, but it contains challenging words, ideas, and themes appropriate for classroom discussion with these gifted students. As part of this literature study, the students learned vocabulary words from this book. The word selections were taken from two literature resource books, *Literature Unit for A Wrinkle in Time*

(Carratello & Carratello, 1991) and *A Wrinkle in Time: Literature in Teaching* (Jaffe & Doherty, 1997.) The researcher selected these words as ones that were examples of Tier Two words found in Appendix A of Arizona College and Career Ready Standards:

> Tier Two words (what the Standards refer to as general academic words) are far more likely to appear in written texts than in speech. They appear in all sorts of texts: informational texts (words such as relative, vary, formulate, specificity, and accumulate), technical texts (calibrate, itemize, periphery), and literary texts (misfortune, dignified, faltered, unabashedly). Tier Two words often represent subtle or precise ways to say relatively simple things—saunter instead of walk, for example. Because Tier Two words are found across many types of texts, they are highly generalizable. (Arizona Department of Education, 2013)

The book was broken into five sections to be read over a 5-week period. Each section included two or three chapters and had a word list of 10 words (Appendix A). At the beginning of the week, each student made a 3x5 vocabulary card for each of the words in the section. On the front of the card, the student wrote the word and drew a visual representation of the word intended to help with remembering the word. On the back of the card, the student copied the definition of the word and used it in a sentence, showing an understanding of the meaning of the word. The student also added the part of speech for the word that matched the definition. The students used these cards to study the vocabulary.

From these lists of words the treatment lists were formed (Appendix A). A total of 50 vocabulary words from the book were being studied by the students during this unit of literature. Tracking 50 words in writing samples during the 18-week study was too cumbersome, so the list needed to be systematically shortened. The words from each

section were written on individual slips of paper and were randomly selected from a bag. Two words from each section were put onto each list, No Treatment, Traditional Teaching, and Games. The rest of the words were not used in this study. Each list contained 10 words, for a total of 30 words.

One list of words received No Treatment for the study. The second list of words received Traditional Teaching methods. This method included doing activities such as completing worksheets by matching words to definitions, filling in the blanks, or solving puzzles. This method was used to control for the influence of repetition. Games involve an element of repetition; Traditional Teaching methods were in place to show that repetition alone would not answer the research questions.

The final set of words was used when the three different vocabulary games were played. The three games used were *Bingo, Vocabulary Bacon*, and *Cranium*. Below is a brief explanation of each of the games. The Game Treatment list contained only 10 words, which was not enough for any of these games, so other vocabulary words from other subjects such as Language, Social Studies, and Science were added.

Students played a fourth game that did not require the use of any of the vocabulary lists. *Wacky Word Race* is a team game in which contestants practice the skill of editing. Racing against the clock, students continue to rewrite (edit) a sentence, gaining points as they go. Vocabulary becomes an important part of this game because teams receive bonus points when players use vocabulary words as part of the sentence.

Table 2

Games Played and Affordance of Learning

Game	Explanation of Cognitive Skills	Affordances of Learning
Bingo	*Bingo* is rote memorization *practice* of the definitions of the words. The students hear each definition 5-10 times while playing the game.	• Engagement • Crutch for success (students can "cheat" by looking at the definition until they feel comfortable with the word, but doing so is acceptable in the game play) • Reward for winning – multiple winners • Thrill of competition
Cranium	*Cranium* involves interpretation of the definition both by the player, who knows what the word is, and by the team members, who are trying to guess the word. Students must have a deeper understanding of the word. It uses more parts of the brain since it involves language, art, and physical acting. It uses creativity, teamwork and competition.	• Engagement • Social involvement – team game • Many brain modalities used for the different *Cranium* elements • Whole body involvement • Thrill of competition
Bacon	*Bacon* also uses rote memory, but each definition is given only once in the course of the game. It also involves teamwork, competition, and physical activity.	• Engagement • Social involvement – team game • Physical exercise incorporated in the learning • Thrill of competition
Wacky Word Race	*Word Race* is an editing game. Students alter sentences by changing the noun, verb, adjective, or adverb. Bonus points are given if any of the new words are vocabulary words. It involves individual knowledge, teamwork, and competition.	• Engagement • Social involvement – team game • Vocabulary learning transferring to writing • Thrill of competition

Students played *Bingo* using the vocabulary cards they made listing the words and definitions (Appendix A). *Bingo* was the easiest of the games and one many students already knew how to play. Students selected 16 of their cards to spread on their desks in a 4x4 array, with the words facing up. Because the Game word list contained only 10 words, other vocabulary words were added from other content areas. The researcher read the definition of the word and the students placed a marker on the correct word for that definition. Players were allowed to check the definitions on their cards if needed. When a player got four in a row, "Bingo" was called and the words were checked to confirm they were correct. Students cleared their boards, shuffled the cards, and began again.

The researcher has altered the commercial version of *Cranium*© (2002) for use in the classroom. In the commercial version of *Cranium*©, players move around a game board on spaces to determine which of the four activities the person will do for his/her team. In the classroom version, the class was divided into small groups of four to six players and they played in teams. The score was kept on the white board. In the commercial version, once a player lands on a space, a card is selected from one of four boxes: Star Performer, Data Head, Creative Cat, or Word Worm. Each contains a variety of activities that the player must perform in order to enable his/her teammates to correctly guess something. For the classroom version, a die was rolled instead and the number corresponded to an activity. The classroom version category names were similar to those of the original version, but because it focused on vocabulary, all the activities dealt with words and their meanings.

Each team sent a player up to the front of the classroom to the researcher, who showed them one of the words from the list. The researcher then rolled a four-sided die to determine which *Cranium* activity would be performed.

1. Star Performer – Players used *Charades* to get their team to guess the word.
2. Word Worm – Players used synonyms or antonyms to get their team to guess the word (they were not allowed to use a part of the word).
3. Creative Cat (Draw) – Players drew on a white board to get their team to guess the word (no letters, numbers, or symbols).
4. Creative Cat (Sculpt) – Players sculpted *Play-Doh* to get their team to guess the word (no spelling out words).

Players then returned to their teams and completed whichever activity was randomly selected to try to get their teams to guess the word. Players could not start until all players were with their teams and a "go" bell was rung. Requiring players to wait for a start signal prevented teams that were physically closer to the researcher from having an unfair advantage. The first team to correctly yell out the word was awarded a point. Ties were frequent in this game.

The final vocabulary game was a version of tag that incorporated running and reviewing vocabulary. This game was called *Vocabulary Steal the Bacon*, abbreviated to *Bacon*. It was taught last for two reasons. First, it generated the most student excitement and physical activity. Second, it was played outside where there was sufficient space to run, and consequently the weather also had to be cool enough for a running game, since this research was conducted in Southern Arizona where the school year begins in late

July. For this game, the class was divided into two teams. Each team divided the list of words evenly among team members, assigning each member specific words. The researcher called out the definition of a word and the player from each team assigned that word approached the centerline, where the "bacon" was located. Both players competed to grab it, after which the successful player attempted to run with the bacon back across the team safety line before being tagged by the opponent. If while running with the bacon toward the safety line the carrier was tagged, and the tagger said the correct word, the tagger's team was awarded a point. If the runner made it across his/her safety line, the runner then had to say the word to the researcher. If the word was correct, the runner's team scored a point; if it was incorrect, the runner's opponent had the opportunity to answer and, and if that answer was correct, the opponent's team scored a point.

The fourth game was called *Wacky Word Race* and it incorporated the skill of editing. The researcher originally found this game in the book *Grammar Wars* (Ready, 2000, p. 48.) In the book the game was called Parts of Speech Relay, and the researcher adapted the original version over time to better meet the needs of her own students. Students played in teams of four, with each player being assigned responsibility for a part of speech in a sentence: noun, verb, adjective, or adverb. The researcher displayed a sentence to the teams and they copied it down on a piece of paper. A timer was set for two minutes, during which time each group rotated its paper around the table. Players changed their word type in the sentence each time the paper was passed to them. The sentence had to continue to make sense grammatically, but it could be a fanciful sentence, for example, "Animals can talk and be blue." When the time was up, the teams counted

how many changes had been made to the sentence. Bonus points were awarded if the final sentence contained vocabulary words from any curriculum taught in the classroom. This game helped the students practice using vocabulary words when editing writing; however, specific vocabulary lists are not required for play.

Playing games was an important part of learning vocabulary; the students were not just having fun but were more engaged in their learning. Learning took place in the context of a social element, which helps many students acquire new information. The study participants played the four games described in a particular order. *Bingo* is the simplest, comprising only rote memorization of the words and definitions. Students played this game first so that they could become very familiar with the words. It is an individual game, so that the enhanced element of group competition was not added until the words and their meanings were better known. *Cranium* is a difficult game because the students must have a deeper understanding of the words in order to represent them in the various mediums and thus communicate them to their teammates. As teammates, they must have a good memory of the word list they were working from to guess possible words. This game also adds team competition and social interaction to the game play. The third game, *Bacon*, also relies on memorization, but it includes physical movement, team competition, and personal accountability. The excitement during this game is very high. *Wacky Word Race* is a team game with competitive scorekeeping, but each student is responsible for his/her own word editing. The time limit adds to the excitement of this game.

Action Plan for the Innovation

The vocabulary study took place during the first 18 weeks of the school year. In the first 5 weeks students read the literature book, learned the vocabulary, responded to writing prompts, and played some of the games. During the remainder of the weeks the students continued to play games and write prompts.

Data Collection Tools

The researcher employed a variety of research tools to answer the research questions thoroughly. This section includes a description of those tools and how they were used. The concurrent embedded strategy was used, allowing the quantitative and the qualitative data to be collected simultaneously (Creswell, 2009). Table 3 summarizes the types of data collected. The Ghant chart shows the timeline with which the data were collected (see Figure 1).

Table 3

Data Collection Tools

	Quantitative	
Item	**Description**	**Justification**
Pre/Post Vocabulary Test	This test showed which words the students could match to the definitions. Students took it three times during the study.	These data were needed to determine which words the students knew the meanings of before beginning the study, if they were learning them during the study, and if the words remained in their long-term memories when the study ended.
Word Wall	These data revealed whether students recognized the words in contexts other than in the book they originally read or within the game play.	These data indicated whether the learning of these words was transferred to other contexts over time. These data were collected over the entire length of the study.

Quantitative		
Item	**Description**	**Justification**
Traditional Teaching Activities	These data showed whether mere repetition of the traditional teaching activities affected students' learning of vocabulary.	These data were needed to rule out repetition of the games as the factor allowing students to learn the vocabulary. These data helped control for that factor.
Paragraph Word Count	Students wrote a paragraph based on a given writing prompt. These paragraphs were analyzed for use of the target vocabulary words.	The goal of the research was to determine if the students were using the vocabulary in their writing, not just memorizing the words. Any vocabulary words used in this writing were counted. Use of vocabularyfrom other word lists and subjects was also noted.
Wacky Word Race	This was a game that students played in teams, practicing editing sentences by changing the words to make the sentence more interesting. Students earned bonus points for using vocabulary words.	The researcher had students play this game to get them excited about editing and about using their vocabulary words in a fun and competitive way. The researcher collected the game sheets and counted the vocab words used to see which students were using their vocabulary words in this game.
Qualitative		
Item	**Description**	**Justification**
Pre and Post Questionnaires	These questions were used to gather student opinions about games and the study of vocabulary.	These data were needed to facilitate understanding of students' collective and individual feelings about the effects of the study and the research questions.
Field and Videotape Notes	The researcher made these observations while the games were being played and at other times in the classroom.	These data added information about how the students felt about playing the games and what they were learning. The researcher could not anticipate the random comments that children might make; therefore, she needed a way to capture these moments that add to the overall insight regarding the research questions.

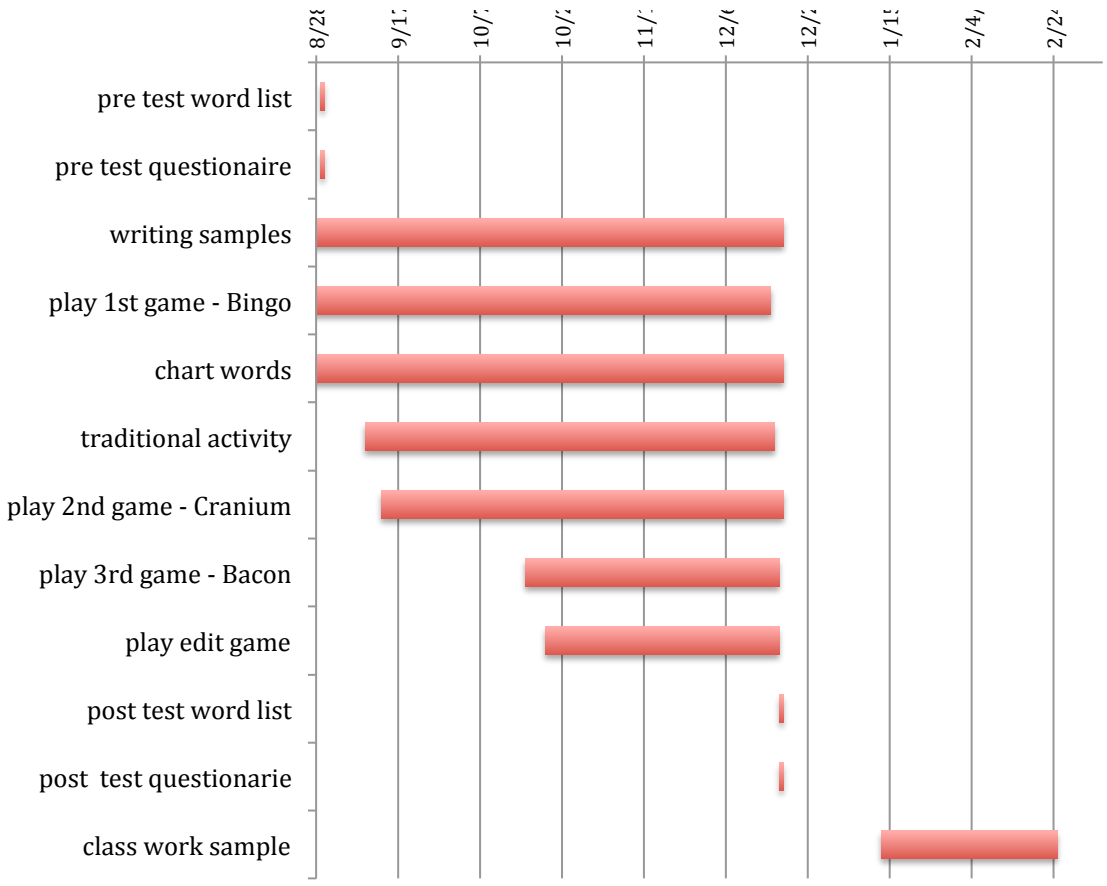


Figure 1. Timeline of data collections.

Quantitative data collection tools.

Vocabulary test. A 30-word vocabulary test was given. The words were taken from the three different treatment lists and combined in one test in which students were asked to match the word with the definition (Appendix B). This test determined the percentage of words with which the students were already familiar. This test was given two other times, once at the end of the 5 weeks of the literature study unit to see whether the students had been learning the definitions. It was given again at the conclusion of the study, 18 weeks later, to assess whether the students had retained the word meanings in their long-term memories. The results of the test were put into an Excel spreadsheet to

track the raw score and percent correct for each student. The class mean was then computed along with the standard deviation for each test (pre test and two post tests). This information was then converted to a bar graph comparing the class means of the three tests.

Word count. Students looked for the 30 words in other reading material that they were completing independently. When the students discovered these words in other sources, they recorded them on a display board in the classroom. At the end of the 18 weeks, the words were removed from the wall and the number of times students recorded sighting each one was counted (see Figure 2). The researcher first tallied these responses by hand onto the three different word lists: No Treatment, Traditional Teaching, and Games. The tallies were totaled and transferred to an Excel spreadsheet. The three categories were compared using a bar graph.

Vocabulary questionnaire (select questions). Students completed a pre-questionnaire (Appendix C) and post-questionnaire (Appendix D) about their feelings toward learning vocabulary as a means of measuring social-emotional learning along with academic achievement. In the pre-questionnaire, questions 1 and 2, and question 1 on the post-questionnaire, had only one answer per student. These responses were tallied by hand and then the totals were transferred to an Excel spreadsheet. Each set of results was transferred to a bar graph for comparison. Questions 3 on the pre-questionnaire and 10 on the post-questionnaire, and 5 on the pre-questionnaire and 12 on the post-questionnaire, were the same question. These sets of questions asked students to compare their feelings before and after the treatment. These responses were tallied by hand and

transferred to an Excel spreadsheet, and then each question was displayed on a bar graph for comparison.

Figure 2. Word sighting board.

Figure 3. Directions for word sighting board.

Writing samples. Nine writing samples were taken from each of 19 participants. Eight of these were taken during the 18-week study and one was taken 22 weeks later (Appendix E). Students were read the same set of directions; given the fictional prompt; and then asked to write, edit, and rewrite their essay. No time limit was given for the writing and all responses were completed at school. The researcher read each final draft to determine how many of the 30 words from the combined word lists appeared; additionally, other vocabulary words from word lists not in the study were also noted. The totals were put into an Excel spreadsheet and displayed in several different graphs, allowing for comparison of different types of information.

Wacky Word Race. Students played the game Wacky Word Race to practice editing sentences, changing the words to make the sentences more interesting. Students earned bonus points for using vocabulary words. The intention of having students play the game was to get them excited about editing and to have them practice using their vocabulary words in a fun and competitive way. The game sheets were collected twice and the words used were counted to see which students were using their vocabulary words in this game. These responses were tallied and put into an Excel spreadsheet. The information was then put into a pie chart to assess the percentage of students who were using their vocabulary words during this game play.

Traditional teaching. Students completed five traditional teaching activities to practice the words on the traditional teaching word list. These activities included writing a sentence, figuring out a crossword puzzle, completing a matching exercise, conducting a word search, and performing a fill-in exercise (Appendix F). These activities were

administered to control for repetition in using words during game play. No further analysis was performed on these items. The purpose of these activities was for the students to practice with the Traditional Teaching sub list of words. The intent was to investigate whether repetition alone increased the likelihood that certain words would be used more than others. This measure would control for the fact that the words on the Games sub list would be used more often and that the repetition of using those words could be a determinant factor in those words' seeing greater usage by the students.

Qualitative data collection tools.

Vocabulary questionnaire (select questions). The pre-questionnaires (Appendix C) and post-questionnaires (Appendix D) also contributed to the qualitative data. On the pre-questionnaire, question 6 was an open-ended question, and nine of 19 students provided answers. The post-questionnaire had nine open-ended questions, and all 19 participants answered them. The open coding method was used (Corbin & Strauss, 2008). The researcher first listed all of the comments that students had made, combining those that were the same or very similar in wording or meaning. She then put them into eight general categories based on the subject/topic that the comment referred to: *physical*, *emotional*, *whole child*, *location*, *game play*, *mental*, and *other*. These comments were tallied, put into a chart in Excel, and then converted to a pie chart.

Field notes. Anecdotes and comments made while the students were playing the games were collected by the researcher and written in a journal. These comments were recorded when students played the games, after the gaming sessions, or at unrelated times when students made comments about vocabulary or vocabulary games. These notes

included comments the students made or behaviors observed during the game play. Videotaping also took place during the gaming sessions.

Overall, this study unearthed many varied pieces of data. The researcher collected six different pieces of data in this mixed-methods study. She used four quantitative measures to analyze the vocabulary tests, questionnaires, word sightings, and writing prompts. Qualitative measures were used with the questionnaires and field notes. The following chapter discusses the findings of this analysis.

CHAPTER 4

RESULTS

Data Analysis

This mixed-methods study using games to teach vocabulary incorporated several quantitative and qualitative measures. Nineteen fifth-grade students studied Tier Two vocabulary words using four different games. The researcher gathered data using tests, questionnaires, writing samples, and field notes to analyze the students' understanding of the words, feelings towards the study of vocabulary, and transfer of the usage of the words to their own writing. In this chapter, the results of that data will be discussed and analyzed.

Quantitative Data Results

Brief description of analysis. For this concurrent, mixed-methods research study, the researcher gathered many pieces of qualitative and quantitative data to answer the research questions. Quantitative data were collected from the vocabulary tests, word-sighting board, and word count in the writing samples. The questionnaire gleaned both types of data; graphs to be analyzed from the tallied responses and questions regarding attitudes toward vocabulary and games provided qualitative data in the form of open-ended questions. Both sets of data helped to answer all three research questions.

Vocabulary test. The researcher created the pre and post vocabulary tests (Appendix B) that used all 30 words from the novel *A Wrinkle in Time*. The test matched the word to the definition. The same test was given for all three examinations, and all 19 of the participants took it, in a group-administered setting. Once the students took the

test, the researcher took it home, where she scored, recorded, and stored the test and the results.

For this study, 19 gifted fifth-grade students were studied; the return on the three vocabulary tests given was 100%. Each test was scored with number of correct vocabulary words placed over the total number of vocabulary words, and the percent correct was calculated. This information was put into an Excel spreadsheet. From there, the mean and the standard deviation were calculated for each test. The information was then put into a bar graph, which was used to compare each test (see Figure 4). The class took a pretest of the words and scored a mean of 21.67 with a $\sigma = 11.91$. The post-tests were given at 5 weeks and 18 weeks. The scores for these tests were very similar with a mean of 71, $\sigma = 23.35$ and 71.67, $\sigma = 24.04$, respectively. The standard deviation of both these tests also stayed very consistent. These are statistically significant data. No significant difference was found in regard to the word list and the treatment from which the words were taken/used.

Student groupings. The sample of 19 students was grouped into smaller subgroups to further analyze the quantitative data. Using the students' scores on the CogAT, the researcher placed the students into three subgroups: Verbally Gifted, those who scored 94% or above on the Verbal section; Verbally Average, those who scored between 80% and 93%; and Verbally Below Average, those who scored below 80%. There were six students in the Gifted group, ten in the Average group, and three in the Below group. The data for Boys, $n = 9$, and Girls, $n = 10$, were also separated out. The means for the pre-test and the second post-test were compared for each of these groups as

well as for whole class (see Figure 5). The percent gain between the two tests was also calculated (see Figure 6). All groups made a significant gain. The Verbally Average group made the greatest gain with an increase of 61.33% while the Verbally Below Average made the least gain with 31.33%.

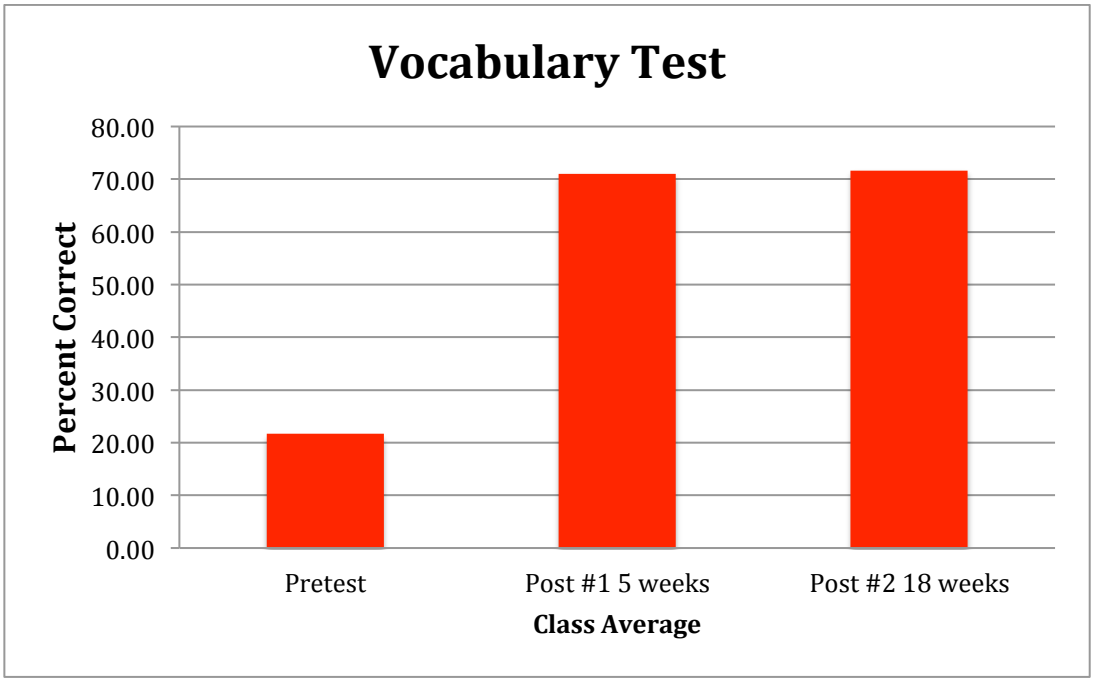


Figure 4. Vocabulary test mean comparison.

Word sightings board. These words were the vocabulary words that the students found in other pieces of literature. The words were grouped into three random lists (see Appendix A): No Treatment, Traditional Teaching, and Games. The students found a total of sixty-seven words separated into the following categories: No Treatment = 18, Traditional Teaching = 28, and Games = 21 (see Figure 7).

Vocabulary questionnaire (select questions). The questionnaire (see Appendixes C and D) provided quantitative data regarding certain questions. Pre-test Question 3 and Post-test Question 10 were the same question: Do you like learning new

vocabulary words? For the pre-test question, 68% of the participants said yes and 32% said no, while in the post-test, 89% said yes and only 2% said no. These data reveal an increase of 21% for the positive response (see Figure 8).

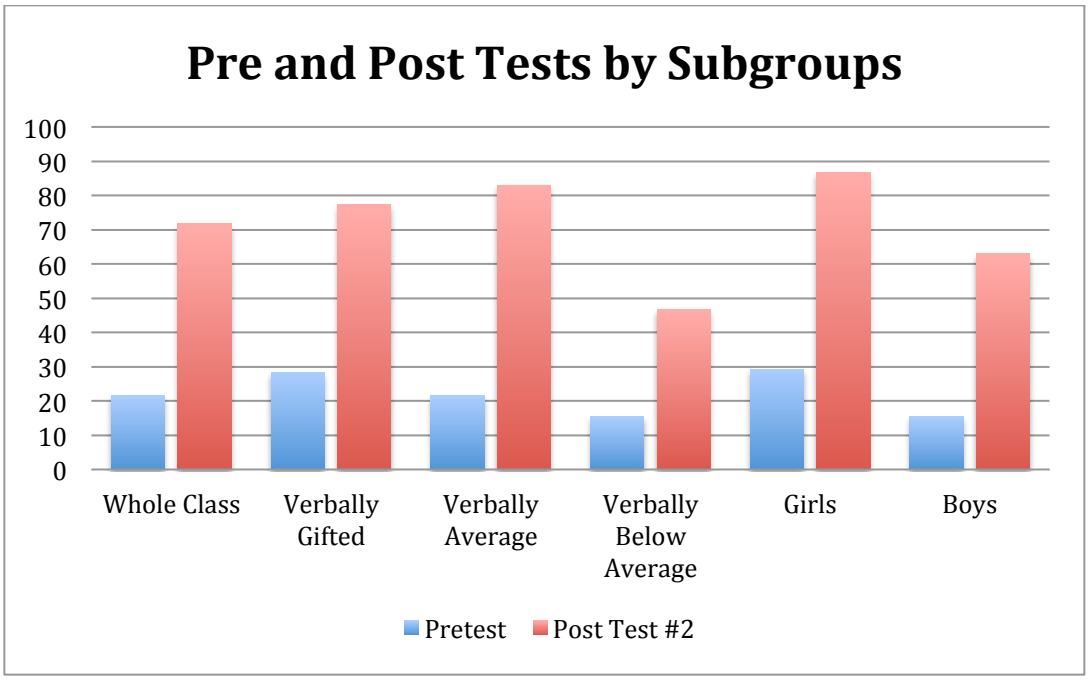


Figure 5. Mean comparison of vocabulary tests by subgroups.

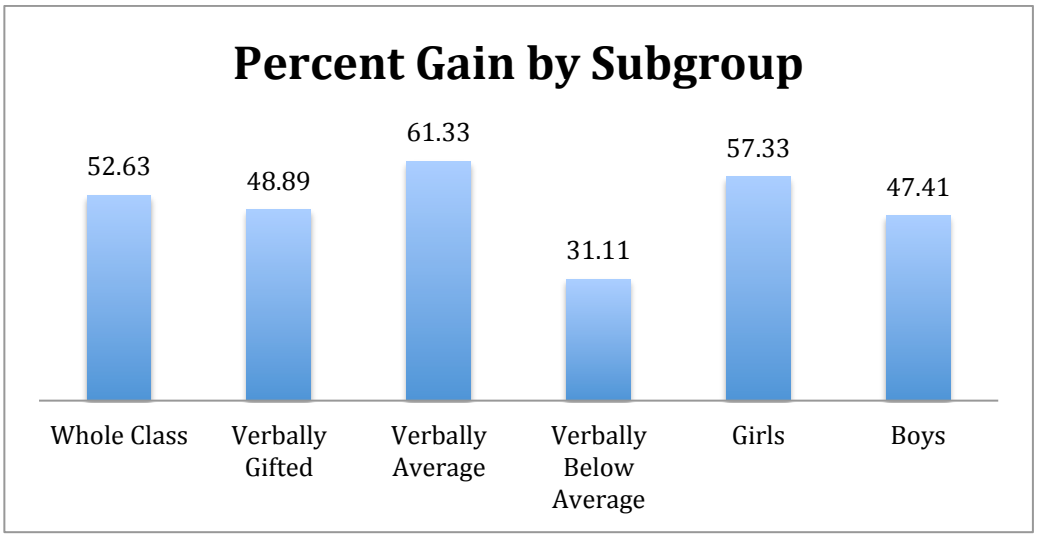


Figure 6. Percent gain between means of pre-test and post-test 2 by subgroup.

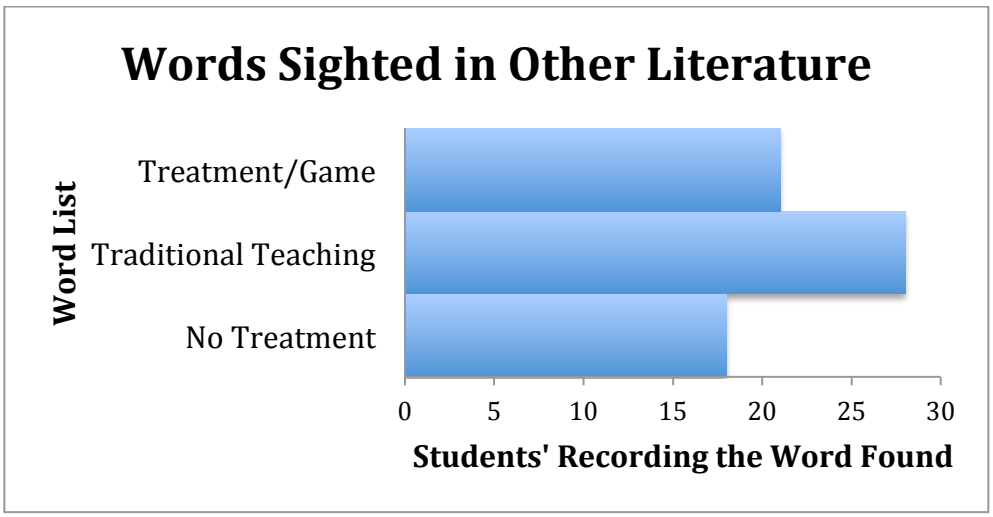


Figure 7. Words sighted in other literature.

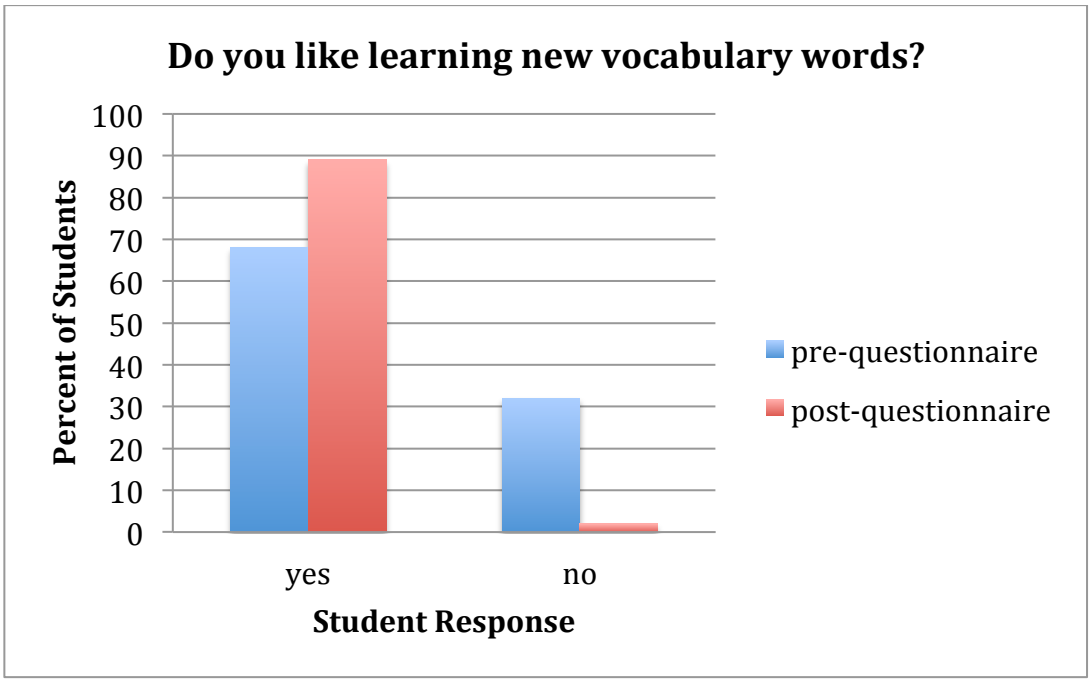


Figure 8. How students feel about learning new vocabulary.

Questions 5 on the pre-test and 12 on the post-test were also the same question: How do you feel about studying vocabulary in school? The responses on the pre-questionnaire indicated that 5% of students enjoyed it, 89% responded that it was OK,

and 5% did not like it. The post-questionnaire responses indicated that 53% of students enjoyed it, 47% indicated that it was OK, and 0% did not like it. These numbers show a positive gain of 48% (see Figure 9).

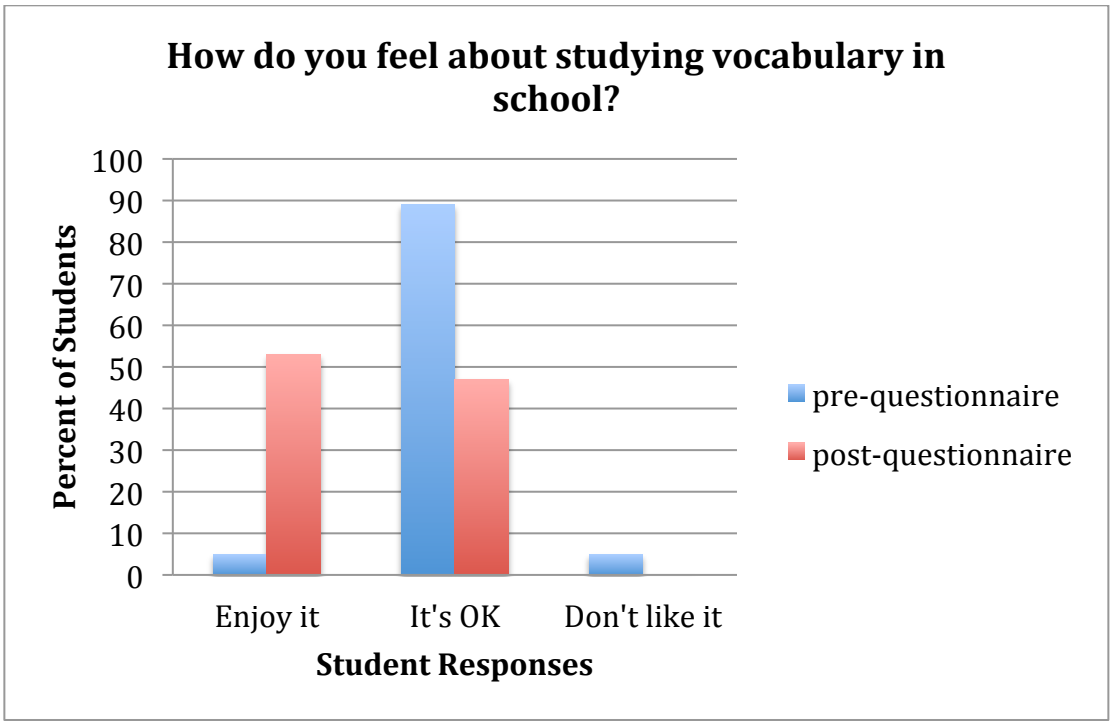


Figure 9. How students feel about studying vocabulary in school.

Students played three different vocabulary games to learn the meanings of the words. On the questionnaire, they were asked to rank their favorite game. *Bacon* came in first with 58% of the students selecting it as their favorite; this game was ranked second by 31% of the students, and third by 16%. *Cranium* was the second-favorite game with 26% selecting it as their first choice, 37% as their second choice, and 37% as their third choice. *Bingo* was the least favorite game with only 16% of the students ranking it as their favorite, 31% ranking it second, and 53% choosing it as the third-favorite game (see Figure 10).

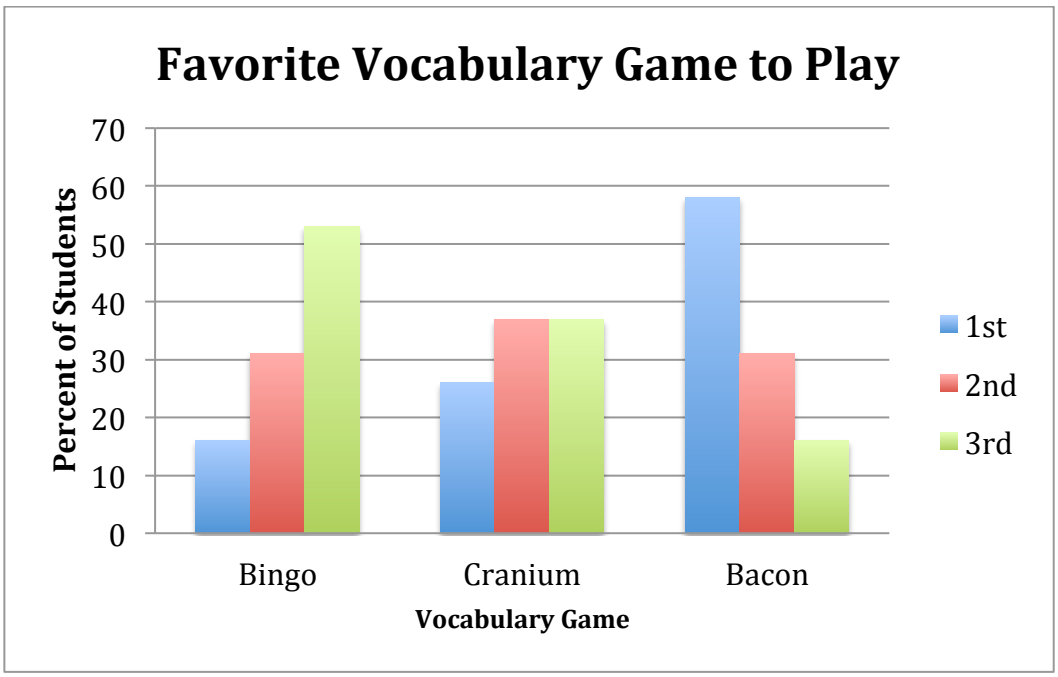


Figure 10. Favorite vocabulary game.

These results were also analyzed using the different subgroups: the three levels of vocabulary ability, boys, and girls. No significant difference was found in the preference of games within the vocabulary groups or among the girls. However, 100% of the boys preferred the game *Bacon* to the other two.

Writing samples. The students in the study each completed nine writing prompts (see Appendix E): eight during the 18 weeks of the study and one at the end of the school year. At the end of the study, the researcher then read each prompt looking for uses of any of the 30 vocabulary words. Student responses to prompts 1, 2, 6, and 8 all had zero vocabulary words. Student responses to prompts 3 and 5 had two words, prompt 7 had three, and prompt 4 had five, while prompt 9 had two words (see Figure 11). In addition, other vocabulary words were also found in the writing prompts. These were words that

were not on the target list from the study, but were other vocabulary words that were being learned as part of the classroom curriculum. Nine different prompts comprising 21 words were administered. The final prompt contained the greatest number of vocabulary words: two from the target list and seven from other word lists.

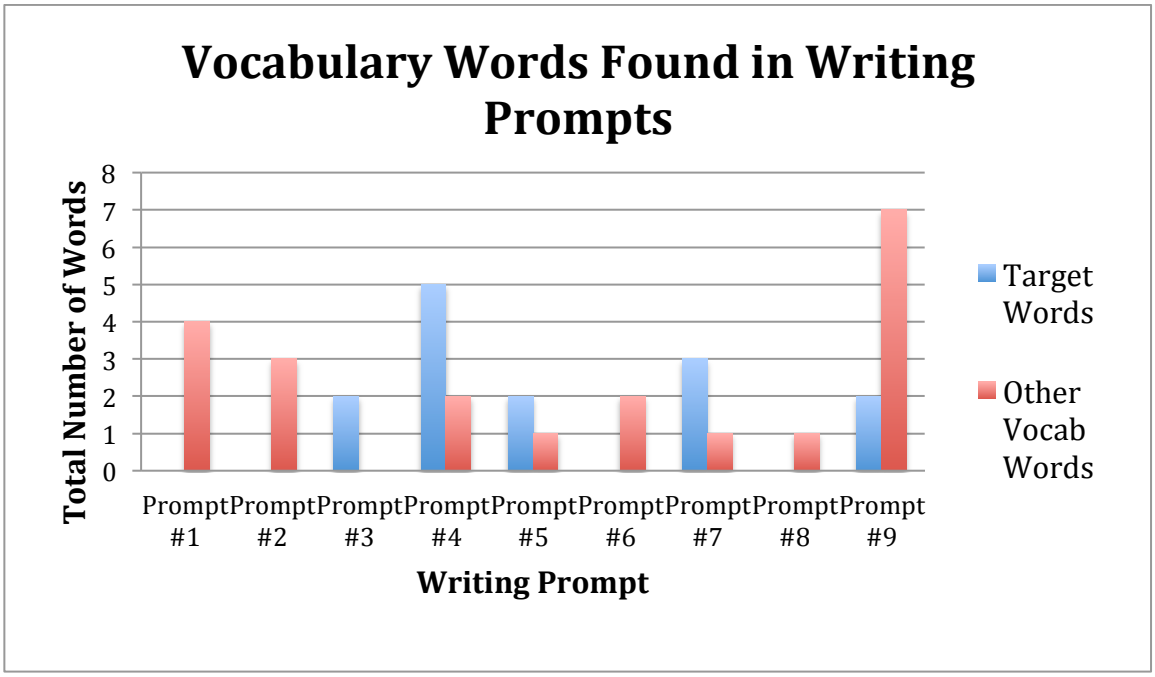


Figure 11. Vocabulary words found in writing prompts.

A second analysis was conducted upon word count data. The researcher tallied how many vocabulary words total each student used when responding to all nine of the writing prompts. During the study, particular students used the vocabulary in their writing more than others. Thirteen students did not use vocabulary words in their writing, and only six did use them. No significant difference was apparent between the different word treatment lists and the occurrence of the vocabulary words in the students' writing. Eleven students used vocabulary from other lists not targeted in this research study in

their writing. Six students did not use either type of vocabulary words in their writing (see Figure 12).

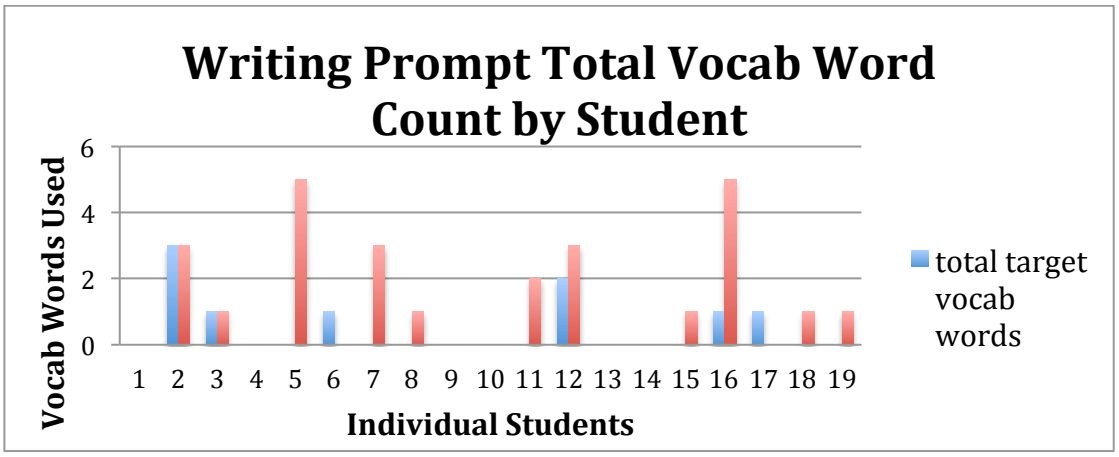


Figure 12. Vocabulary words found in writing prompts per student.

Looking at this information another way, 42% of the students did not use any vocabulary words from *The Wrinkle in Time* vocabulary list, while 58% used vocabulary words in some way. This data can be misleading, however, since students could fall into more than one of these categories. The 11% of students that fell into the category Both Types of Words are also represented in either the Target List or Other Words List (see Figure 13).

Wacky Word Race. Students played this game to practice editing sentences and to use their vocabulary words. The students played this game several times white boards and then twice using paper. The game sheets were collected once during the 18-week study and once right before the end of school.

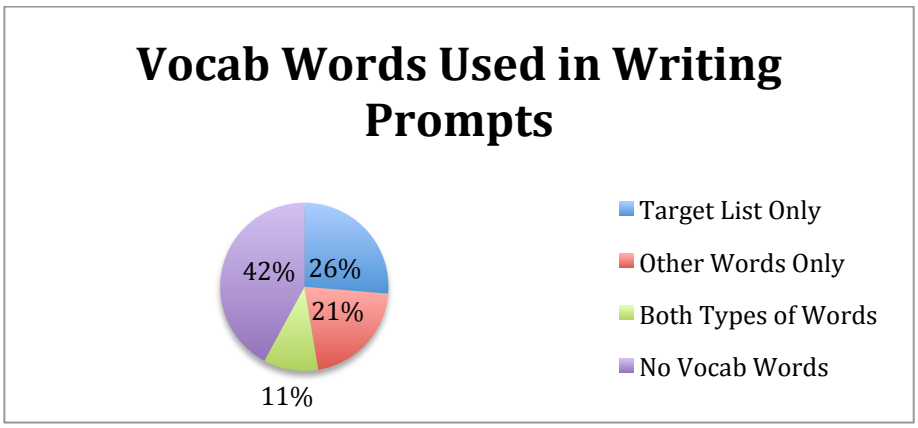


Figure 13. Percentage of students who used vocabulary words used in their writing prompts.

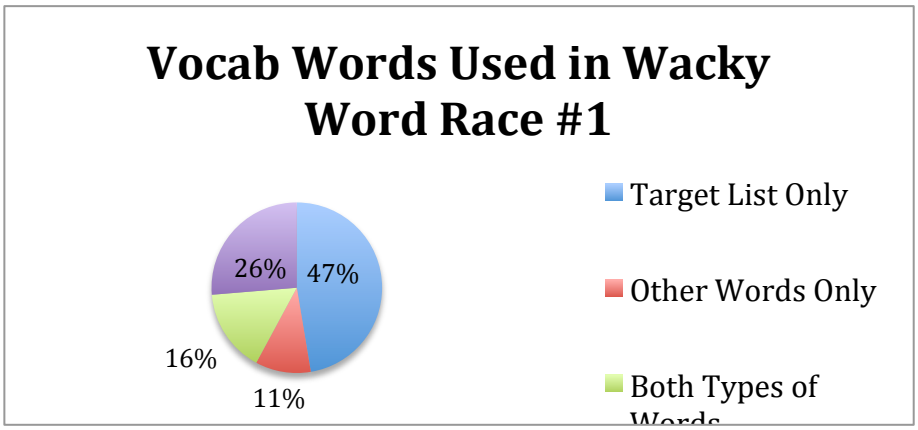


Figure 14. Percentage of students who used vocabulary words while playing Wacky Word Race in Game #1.

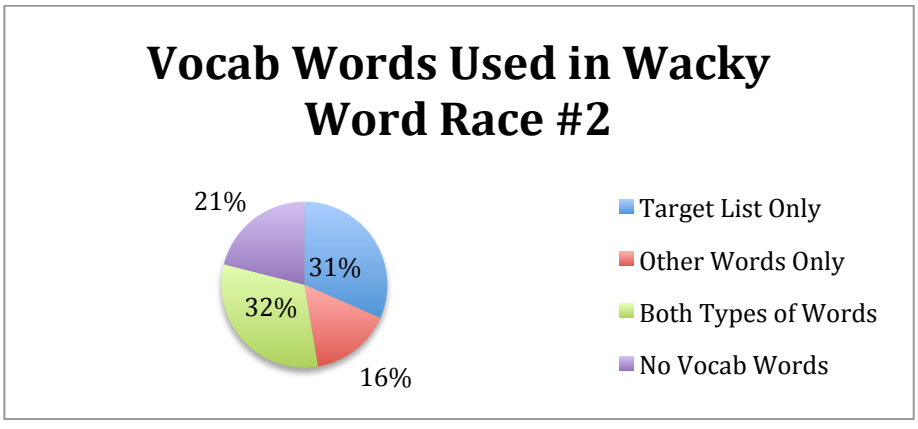


Figure 15. Percentage of students who used vocabulary words while playing Wacky Word Race in Game #2.

In the first game, 26% of the students did not use any vocabulary words, while in the second game, 21% did not. This data reveals a decrease of 5% in vocabulary use during games. A more significant gain was that 32% of the students used both types of words in the second game, a 100% increase from the first game.

Qualitative Data Results

In order to delve into the research questions more deeply and to measure student attitudes, the researcher included qualitative data in the study. These data were collected concurrently and were not weighted more or less heavily than the quantitative measures.

Vocabulary questionnaire (select questions). The questionnaire (see Appendixes C and D) contained open-ended questions that students answered to the best of their ability. The researcher then used an open coding method (Corbin & Strauss, 2008) and discerned seven themes: physical action, emotional, whole child, mental, location, social, and game play. The researcher went through all the responses and relisted them under each of the themes and counted the total number of responses for each. For phrases that were repeated, the researcher put a tally mark next to the original statement. The final column in Table 4 shows the totals for each theme.

Field notes. During the 18 weeks during which the research study was conducted, students played games 12 times. *Bingo* was the game students played first and most often—four times. *Bacon*, the students' favorite game, was played three times, and *Cranium* was played twice. *Wacky Word Race* was also played three times. The students made few comments regarding the games; the researcher wrote down any comments

made and coded them based on the themes listed in Table 4. These statements centered on the social or emotional aspects of the game.

- Student #15 - "That was more fun than I thought it would be."
- Student #6 – I like Vocab Bacon, it's fun!"
- Each day when student #13 came into class, heed check the daily agenda to see what was planned. If a vocabulary game was listed, he was happy. If *Vocab Bacon* was listed, he got really excited and went around the room telling all his friends that they were playing that game that day.

Other comments had the theme of game play.

- When playing *Cranium* - "How did you get that word?"
- Also when playing *Cranium* students engaged in a great deal of debate about meaning when students while sculpting their words.
- While playing *Bingo*, some students got very excited about the different ways to win: Comments similar to "I can get Bingo going 3 ways" were often heard.
- While playing *Bingo*, some students knew their words well; others relied on peeking at the definitions on the cards during play. At first this latter behavior was regarded as "cheating," but when the students learned that the teacher found this behavior acceptable, other students began to use this method as well.

A third category of notes centered on the use of vocabulary words.

- Student #16 began to use a few vocabulary words regularly in her class work when writing and answering questions in reading. One of these words, *furtive*, was from the target list, and two, *mauve* and *verdant*, were from other word lists used in the classroom and also used in games.
- The class was playing Mad Libs (a word game in which the players fill blanks with words constituting different parts of speech) and the students started answering with words that were on the vocabulary lists.
- Student #14 commented when returning from the computer lab after completing a writing assignment, "I used a vocabulary word."

The researcher found observation of and interaction with students to be beneficial in gathering evidence about the effectiveness of studying vocabulary with games.

In addition to field notes, the researcher made three video recordings while the students played the games *Bingo, Cranium*, and *Wacky Word Race*. The footage from the video was downloaded onto the computer and burned onto two DVDs. A second researcher watched the recordings to offer an unbiased viewing of the footage. She looked and listened for any reference by the students to vocabulary. She did not hear them discuss anything regarding their vocabulary words. The researcher from this study also watched the footage, listening for these same types of phrases, and did not hear any. She watched it a second time focusing instead on different affordances of learning (see Table 2). This time she could see that the students were engaged during all three games. During *Cranium* and *Wacky Word Race* the students displayed a lot of social interaction

and enthusiasm. When they played *Cranium,* students challenged each other about how they created a particular word.

Table 4

Coding for Responses to Questions

Code	Explanation	Examples	Tally
physical	Anything that involves physical action on the part of the respondent.	• You could be more athletic. • Bacon is fun because you could run.	25
emotional	Involves the respondent's emotions.	• It is fun. • I learn things better and faster when I have fun learning them.	8
whole child	Involves multiple parts of the child, mind and body, art and word.	• It doesn't matter if you were the fastest in the class if you didn't know the word.	1
location	Where the game takes place	• It is outside.	5
social	The way in which the students interact.	• I like how the teams cheered. • Bacon involved laughing, smiling.	5
game play	The way games are played.	• In Bacon you don't want to lose, you study because you don't want to let your team down. • Everyone likes a good competition.	19
mental	Has to do with learning	• I like to act and do art. • It uses creativity. • Learning the words by the definition	97
other	Does not fit into any of the other categories	• It's different.	1

This mixed-methods study garnered many pieces of concurrent data. In the following chapter, implications of these findings will be discussed.

CHAPTER 5

DISCUSSION

This chapter will explain the assertions resulting from this research study. In this study of playing games to learn vocabulary words, both quantitative and qualitative data were collected to gather a more complete understanding of the research questions. The classroom is a complex place, and mixed-methods research is a more conclusive way to understand this multifaceted environment (Greene, 2007) than would be using either qualitative or quantitative research alone. The researcher used concurrent data consisting of tests, questionnaires, and field notes to answer the following research questions:

1. What effect does playing vocabulary games have on the chosen academic language in students' writing?
2. Does the playing of vocabulary games increasestudents' awareness of these words in other literature?
3. What were the students' attitudes toward learning academic language when playing games?

Limitations of the study and threats to validity will also be discussed in this chapter. Finally, suggestions for future study in the area of games, vocabulary, and gifted students will be offered.

Assertions

Seven assertions were made at the conclusion of this research study. These assertions relate to the research questions, students learning vocabulary, the affordances of learning outlined in Chapter 3 (see Table 2), and students' feeling towards playing

games. The first assertion relates to the first research question about the effect of playing vocabulary games on students' writing.

Assertion 1. A few students used some of the vocabulary words in their writing after playing the games.

In previous classrooms, when students learned the meaning of new vocabulary words, they rarely used them in their writing; the words were learned primarily for the purpose of understanding them in the reading and passing a vocabulary test. In this study, the researcher examined whether any of the words transferred to the students' own writing and found that of the responses to the writing prompts, four contained words from the target lists. The first two writing prompts resulted in no vocabulary word usage; later prompts showed a slight increase, with six students using vocabulary in their responses. Additionally, all but one of the student-written paragraphs contained other vocabulary words used in the classroom. These were vocabulary words not in the target lists from the research study, but learned through a language activity and used in the games earlier in the year. These nontarget words were from other sources and several students did start using them regularly. Eleven students used these words in their writing. The same words, *mauve* and *verdant,* came up repeatedly, both in response to the prompts and in the *Wacky Word Race* game. This game combines the game elements of student engagement, social involvement, and the thrill of competition with transfer of learning. These elements are all mentioned in the Affordances of Learning in Chapter 3 (see Table 2). In this case, rote memorization of vocabulary transferred to the students' use of those words in writing. Between the first and second time they played this game, the students increased

their vocabulary usage by 32 percent. What this shows is that students grasped the meanings of certain words and then continually used them. These words were the ones that became part of their lexicon. These words did not all come from the original literature study word list, but they were all words that had been studied using games in the classroom. At the end of the year, the students were playing the word game *Mad Libs,* in which the teacher asks for a word that falls into the category of a particular part of speech, and again the students used *mauve, verdant*, and *furtive*, which are not the typical words suggested by fifth-graders and were learned through playing games. This result shows that the students were comfortable using these words.

The next two assertions relate to research question 2 about students' awareness of words in other literature and making them part of their own lexicon. The first step in students' making the word their own is knowing the meaning of the word and remembering it for future use.

Assertion 2. Playing vocabulary games increased students' overall awareness of vocabulary words and their usage of these words in other settings.

When playing vocabulary games, the students became more aware of vocabulary in other situations and then began to use it in their daily classroom activities. Students found 21 words that were on the games list of words in other literature, which was only three words more than was on the list of words that came from other contexts. Students also began to use some of the words in their own writing as they played the games. Students also used the vocabulary words when they played the *Wacky Word Race* game. In this game, students chose words to edit sentences and received bonus points when they

used vocabulary words. This use of vocabulary shows that the learning transferred from the memorization of vocabulary words to use them in the students' writing. The scores for this game were tabulated twice; vocabulary word usage increased from 74% of the students using the vocabulary words initially to 79% of students using them in the second assessment—an increase of 5%. Field notes also indicate that the students were incorporating vocabulary into their everyday classroom experiences. Some of these notes are as follows:

- When returning from the computer lab after completing a writing assignment not connected with this study, student #14 proudly said to the teacher, "I used one of my vocabulary words in my writing."
- Student #16 repeatedly used the word *furtive* when answering written questions throughout the rest of the school year.
- Again the example of playing *Mad Libs* supports this assertion. Student #16 and #3 suggested *furtive, mauve*, and *verdant* as adjectives. All of these had been used in games; only *furtive* was from the list targeted for the study; the other two words had been used in the vocabulary games at other times during the school year.
- Student #17 said, "I like being able to use vocabulary words in my everyday speaking."
- Student #8 commented, "The games make me more aware of my words because I now know how to use them properly."

Students also made comments on the qualitative questionnaire about their use and awareness of vocabulary:

- "I think playing games with vocabulary words made me more aware because most of the time when I study words I forget them right away but with the games I remember most of them." (student #7)
- "Because instead of just learning the vocab words, we are actually implying (applying) them into real life." (student #6)
- "It helped me with my vocab by showing me what the words are like." (student #19)
- "It was a mental process figuring out how to support the meanings." (student #8)
- "Whenever I am speaking to someone I use my vocabulary words." (student #10)

These comments all show that students found the games a helpful tool for learning vocabulary.

Assertion 3. Students retained what they learned. They remembered the meaning of the vocabulary words they learned through playing games, regardless of the type of learning group to which they belonged.

The quantitative measures of the results of the vocabulary test show an increase of 49.33% in the mean scores of the students after 5 weeks. More importantly, the students maintained this average after 18 weeks with a standard deviation that also stayed consistent. These data correlate with the mean and show that these test scores have strong

statistical significance. No outlying scores in either direction are present, showing that the students improved in their scores on both tests. The implication is that that students committed the meanings of these words to long-term memory rather than just memorizing them for the test and then forgetting them. The students were grouped by different learning categories based on their original scores on the CogAT, and all three groups saw a significant average percent gain from the pre-test to the second post-test after playing games for 18 weeks. The Verbally Below Average group contained only three students but still showed an average gain of 31%. Two of those students were also twice exceptional learners, those who are gifted and have a learning difficulty. When the class was grouped by gender, each group also saw a gain, 57% for girls and 47% for boys. This result demonstrates that different types of learners benefit from playing games.

Students also found that the games helped them remember their words, as is indicated by their comments on the qualitative measure. One comment read, “By playing these games I memorize the words easier and faster” (student #17). The open-ended comments on the qualitative measure were coded into eight categories. The category that referred to statements with a theme of learning or memorizing contained a total of 97 comments and was the largest of all the categories coded. Clearly, learning their words was important to the students, but what they really like about the games was having fun playing them.

The final four assertions all relate to the third research question in that engagement in a learning activity correlates with students’ attitudes. This correlation was

the easiest to see when students were playing games. High engagement tends to signify a positive attitude toward whatever is being learned—in this case, academic language.

Assertion 4. Students show strong engagement when playing vocabulary games.

The video footage of the games *Cranium* and *Wacky Word Race* showed a high level of engagement of all students in the classroom. These games included teamwork and social interaction involving everyone in the goal of getting points for their team. Everyone participated actively. Engagement and social interaction are both Affordances of Learning mentioned in Chapter 3 (see Table 2). Comments made on the questionnaire about these games included:

- "The games were fun so I learned my vocabulary fast." (student #11)
- "It combines learning words and play into one games." (student #15)
- "I learn most things better and faster when I have fun learning them. The games were fun, so I learned my vocab fast." (student #11)

The coded comments included three themes that fit within the broader category of engagement. Putting these three categories together resulted in a total of 36 (22%) comments out of the total of 161that had to do with engagement. These categories were the *whole child*, which included comments about art, acting, and using different parts of the brain at once; *physical activity*; and *social interaction*. These last two categories led to the next assertion and the primary reason students enjoy playing games.

Assertion 5. Students enjoy games that are relatively active and have a high level social interaction, such as *Cranium* and *Bacon*.

Assertions 5 and 4 are linked because active learning experiences and learning experiences that involve social interaction are more engaging. Active learning and social interaction are two of the Affordance of Learning mentioned in Chapter 3 (see Table 2). On the questionnaire (see Appendixes C and D), students ranked their favorite games. *Bacon*, which includes knowing the meaning of the words, working as a team, and running around, was selected as the favorite game by 58% of the students. *Cranium*, which is also social and physical, was selected as either the favorite or second-favorite game by 63% of the students. *Bingo*, the least active and least social game, was the favorite of only 16% of the class. This dislike was further shown in the video of the students playing *Bingo*. Students likedplaying this game more than doing a worksheet, but the students clearly did not enjoy it as much as they did the other games played in this study. They demonstrated this attitude through their actions. The students engaged in no talking, laughing, or exchanging of high-fives. Each student worked individually, no camaraderie was exhibited. On the questionnaire, the students indicated their enjoyment in playing the team games. Another interesting note the researcher made indicated that at the beginning of the study the students were more enthusiastic about *Bingo*, but as they learned other, more active games, those more active games became the favorites. The video was filmed toward the end of the study, so those observations were made when other games had been learned. The conclusion is that students preferred more active games once they had learned them, as their comments indicate:

- "*Cranium* was my favorite because it was fun and funny to see everyone's ideas on what to make or how to act out a certain vocabulary word." (student #12)
- "*Bacon* involved laughing, smiling, and running. I love all of those so it was really fun for me." (student #12)
- "In *Bacon* you don't want to lose, you study because you don't want to let your team down." (student #12)

Students appeared to enjoy and be most engaged by the games with the highest levels of social interaction and movement.

Assertion 6. Playing games is good for all types of learners.

The data gleaned from the qualitative questionnaire were used to rank the games by preference and was also disaggregated into the different subgroups. For the three vocabulary groups, Verbally Gifted, Average, and Below Average, no discernable preference was found based on the students' learning styles. Therefore, this researcher believes that student preference is due more to student personality and the type of activities students enjoy than to their learning strengths and weaknesses. The same result became apparent when the game preferences were examined by gender for the girls: No distinct pattern emerged. However, 100% of the boys indicated that *Bacon* was their favorite of the games included in the study. This result supports the idea that teachers would do well to include physically active teaching methods to engage boys in learning.

Assertion 7. In most classrooms, students learn vocabulary by completing worksheets and other passive classroom activities. Most students do not enjoy these activities, but they do like to study vocabulary by playing games.

Learning vocabulary is part of the school curriculum, but many students do not find the process enjoyable. Question 3 on the pre-test and 10 on the post-test asks students whether they like learning new vocabulary words. Positive responses to this question increased overwhelmingly after students played the games that incorporated vocabulary learning; the number of students who answered that they enjoyed learning vocabulary increased by 21%. Questions 5 and 12 on the questionnaires (see Appendixes C and D) addressed the question of attitude toward studying vocabulary in school. Before students played the relevant games, 89% of them indicated that learning vocabulary in school was OK, and 5% indicated that they did not like it. After students played the games, responses in the Do Not Like category were absent, whereas responses in the Enjoy category rose by 53%, a gain of 48%. Additionally, the field notes of the researcher—also the teacher in the classroom—indicate a definite positive response from the students whenever one of the games was listed on the daily agenda. Student #13 checked the schedule on the white board daily and if a game was listed, he went around the room excitedly telling his friends that they were playing games that day. Students did not exhibit this same excitement when a traditional activity, such as vocabulary worksheet, was written there. The students found all of the games to be an enjoyable way to study vocabulary, as evidenced by their responses to the questions on the questionnaire. The favorite game for most of the students was *Bacon*. This preference can

be seen in the quantitative responses in that 58% of the students ranked *Bacon* as their favorite game of those included in the study, whereas only 16% ranked it as their third favorite. The most often cited reason for this preference was that *Bacon* offered the chance to run around outside. Clearly, children enjoy incorporating physical activity as part of their learning experience. *Cranium* was the second favorite game, with 26% of the students selecting it as their first choice. Students made comments about it being creative, getting to draw and act, and getting "your imagination flowing" (student #7) as factors in their enjoyment of *Cranium*. Five positive comments were made by students about how much fun the games were to play. No negative comments were made in response to the questions. None of the students indicated that they did not want to play the games when it was time to do so. The quantitative and qualitative data both support the assertion that games have a positive effect on students' attitudes toward learning vocabulary. On the video recording of *Wacky Word Race,* the students were seen actively encouraging each other to go faster to beat the time limit and cheering when they scored points. It was clear that all students were involved and enjoying themselves while practicing the skill of editing and using vocabulary words. As one student stated, "I think playing games is a very good way to learn words. Please keep coming up with games" (student #4).

Students recognized that playing the games was a good way for them to learn. This particular student found most activities in school boring and a waste of time; the student obviously wanted games to be a part of his learning experience.

Limitations

One of the limitations of this research was that the researcher was also the students' regular classroom teacher. This dynamic made the possibility of biases creeping into the research methods more likely, since the researcher had a vested interest in the students' performing well on the tasks. However, because she was in the classroom with the students all day, teaching them all of their subjects, she was able to take field notes regarding the use of vocabulary among the children on a daily basis. These are situations that a researcher coming in to observe the class on a scheduled time would miss. This proved to be a definite benefit to the study as many of the observations made were not made during the official vocabulary game time.

Another limitation of this study was the sample size. Conducting a study using only one class of 19 students limits the strength of the assertions that can be made based on the findings. With more classes playing these games and writing responses to prompts, the researcher would more likely see a greater trend developing in regard to the use of vocabulary words in writing.

This research study had a select list of target words to measure, and this specificity at times constituted a limitation. Although this list contained some of the vocabulary words studied during the school year, those were not necessarily the words that the students found the most interesting. As a researcher, one cannot determine ahead of time which words students will decide they want to start using. The target list was chosen randomly so as not to contain researcher bias, but the result was that the list contained words that the students were less interested in incorporating into their writing.

On the whole, most fifth-grade students do not like to take the time to edit their writing by adding different words to improve the overall work. An observation made by the teacher is that most students did not edit or change any of their responses to the writing prompts between the rough draft and the final copy; they just wanted to get the assignment done and move on to the next one. The students are not intrinsically motivated to take the time to edit their responses using vocabulary words when they have not been told that the responses to the prompts would be scored with that in mind.

A fourth challenge to conducting research within researcher's own classroom was the lack of additional help in facilitating the games within the research project. More data could have been gathered on the videotapes had an additional person been present to hold the camera, rather than having it be stationary in the corner of the room. The researcher was unable to get footage of the *Bacon* game for this reason, since the game traveled beyond the camera's range.

Threats to Validity

A few threats to validity were present in this study. The first was the natural maturation of the students. Since the participants got slightly older in the course of the study, it was assumed that they would be learning and increasing their vocabulary knowledge. However, this was a relatively short study lasting only 18 weeks, so maturation did not have a large effect. The Hawthorne Effect is the tendency of people to work harder when they know they are part of a study (Cook, 1962). It is possible that the students in this study were susceptible to this tendency. However, the researcher does perceive this possibility as a significant problem. All of the games/treatments and writing

prompts were the type that would typically be offered in this classroom. The students did not know when the activities were part of the study and when the games were just part of the typical school day. The students played these games in the classroom both before and after the actual study timeline. The researcher refrained from announcing that it was research study time in an effort to preclude the students' behaving differently as a result of knowing about the study. Since the researcher was also their regular classroom teacher, the students were comfortable in the classroom and treated all activities in a similar manner. However, this dynamic may have led to an Experimenter Effect. This threat to validity arises when the researcher inadvertently gives signals to sway the research in the direction she hopes it will go (Kintz, Delprato, Mettee, Persons, & Schappe, 1965). Since the study took place in the researcher's classroom, she could easily and unconsciously have given nonverbal or verbal signals to her students that may have influenced the study. These signals could have consisted of the way in which she stressed certain words in the directions, how she read different words during the games, or even the time she chose to have students play the games. The researcher had to be careful to stay as unbiased as possible so that her study remained valid. In qualitative research subconscious clues are always present, so it is not possible for the research to be completely unbiased. This researcher believes that to the best of her knowledge, the research was conducted with as little bias as possible.

Future Research

The most limiting part of the research study was the small sample size; therefore, the next course of study would be to expand the research to more classrooms. By

enlarging the data set, a researcher could determine any trend regarding students' use of vocabulary in their writing. It would also be interesting to see whether the same results would be seen among students of different ages and intellectual abilities. The writing prompts used in the study tended to be fictionalized and open-ended; it would be interesting to investigate whether aligning prompts and vocabulary words more closely would facilitate increased vocabulary usage. Most of the students were not motivated to edit the prompts between drafts, so informing students that vocabulary words used in the prompts would have an effect on their scores might change the outcome; this possibility should also be investigated.

The vocabulary development of gifted students has not been well studied. How does it differ from that of average learners and what are the implications of this difference for the classroom? These are additional avenues of study that need to be pursued in efforts to better understand the gifted learner.

Implications for Using Games in the Classroom

Students enjoy playing games in the classroom. Whether it is to practice math facts, sequence a story, or solve complex problems, when a skill is put into a game, learning suddenly becomes more fun. This increased level of enjoyment can be achieved on or off the computer, with one child or with the entire class. Too often games are left for a reward, for times when a class has to stay inside due to inclement weather, or for fun Friday afternoons. Games should be a part of everyday learning. This study shows that games increase vocabulary learning, help make students aware of their learning, and engage all learners. Games are good for all learners in the classroom—boys, girls, those

with ADHD and other learning difficulties, and those who are gifted or high-ability learners. Teachers can differentiate games to meet the learning needs of all students in a classroom. Whether it be a computer simulation or the more old-fashioned, teacher-led type of game, students who are playing a game will be engaged and maximize their learning.

REFERENCES

Adams, C. M., & Pierce, R. L. (2006). Creative thinking. In F. A. Dixon & S. M. Moon (Eds.), *The handbook of secondary gifted education* (pp. 343-361). Waco, TX: Prufrock Press.

Baker, S. K., Simmons, D. C., & Kame'enui, E. J.(1995). Vocabulary acquisition: Synthesis of the research. *Technical report no. 13.* Eugene, OR: National Center to Improve the Tools of Educators. Retrieved from ERIC database.

Barnett, S. M., & Ceci, S. J. (2002). When and where do we apply what we learn? A taxonomy for far transfer. *Psychological Bulletin*, *128*(4), 612-637. doi:10.1037//0033-2909.128.4.612

Biemiller, A. (2005). Size and sequence in vocabulary development: Implications for choosing words for primary grade vocabulary instruction. In E. H. Hiebert & M. L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 223–242). Mahwah, NJ: Lawrence Erlbaum.

Bragg, L. A. (2012). Testing the effectiveness of mathematical games as a pedagogical tool for children's learning. *International Journal of Science and Mathematics Education*, *10*, 1445-1467. doi:10.1007/s10763-012-9349-9

Butterfield, E. C., & Nelson, G. D. (1989). Theory and practice of teaching for transfer. *Educational Technology Research and Development, 37*(3), 5-38. doi:10.1007/BF02299054

Carratello, J., & Carratello, P. (1991). *A literature unit for A Wrinkle in Time*. Huntington Beach, CA: Teacher Created Material.

Cash, R. M. (2011). *Advancing differentiation: Thinking and learning for the 21st century.* Minneapolis, MN: Free Spirit.

Clark, B. (1997). *Growing up gifted* (5th ed.). Columbus, OH: Merrill.

Cohn, S. J., Carlson, J. S., & Jensen, A. R. (1985). Speed of information processing in academically gifted youths. *Personality and Individual Differences*, *6*(5), 621-629. doi:10.1016/0191-8869(85)90012-1

Cook, D. L. (1962). The Hawthorne effect in educational research. *The Phi Delta Kappan*, *44*(3), 116-122. Retrieved from http://www.jstor.org/discover/10.2307/20342865?sid=21106013838413&uid=2&uid=3739256&uid=4&uid=3739960

Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Los Angeles, CA: Sage.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles, CA: Sage.

Davidson, J., Davidson, B., & Vanderkam, L. (2004). *Genius denied: How to stop wasting our brightest young minds.* New York, NY: Simon & Schuster Paperbacks.

Denzin, N. K., & Lincoln, Y. S. (2008). *Strategies of qualitative inquiry* (3rd ed.). Los Angeles, CA: Sage.

Driscoll, M. P. (2005). *Psychology of learning for instruction* (3rd ed.). Boston, MA: Allyn and Bacon.

Ertmer, P., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from a design perspective. *Performance Improvement Quarterly*, *6*(4), 50-72. doi:10.1002/piq.21143

Feldhusen, J. F. & Moon S. M. (1992). Grouping gifted students: Issues and concerns. *Gifted Child Quarterly, 36*(2), 64-67. doi:10.1177/001698629203600202

Gallagher J. J. (2003). Issues and challenges in the education of gifted students. In N. Colangelo & G. Davis (Eds.), *Handbook of gifted education* (3rd ed., pp. 11-23). Boston, MA: Allyn and Bacon.

Gee, J. (2007). *What video games have to teach us about learning and literacy*. New York, NY: Palgrave Macmillan.

Greene, J. C. (2007). *Mixed methods in social inquiry*. San Francisco, CA: Jossey-Bass.

Gurian, M., with Ballew, A. (2003). *Boys and girls learn differently!: A guide for teachers and parents.* San Francisco, CA: Jossey-Bass.

Hanson, W. E., Creswell, J. W., Plano Clark, V. L., Petska, K., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, *52*(2), 224-235. doi: 10.1037/0022-0167.52.2.224

Hollingworth, L. S. (1926). *Gifted children, their nature and nurture.* New York, NY: Macmillan.

Jaffe, C. S., & Doherty, B. T. (1997). A wrinkle in time: l-i-t guide grades 4 to 9. Hawthorne, NJ: Educational Impressions.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, *24*(4), 602-611 doi:10.2307/2392366

Karnes, F. A., & Marquardt, R. G. (2003). Gifted education and legal issues: Procedures and recent decisions. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (3rd ed., pp.590-603). Boston, MA: Allyn and Bacon.

Kintz, B. L., Delprato, D. J., Mettee, D. R., Persons, C. E., & Schappe, R. H. (1965). The experimenter effect. *Psychological Bulletin, 63*(4), 223-232. doi:10.1037 /h0021718

L'Engle, M. (1963). *A wrinkle in time.* New York, NY: Dell.

Little, C. A. (2012). Curriculum as motivation for gifted students. *Psychology in the Schools*, *49*(7), 695-705. doi:10.1002/pits.21621

Maker, J. C. (1986). Developing scope and sequence in curriculum. *Gifted Child Quarterly, 30*(4), 151-158. doi:10.1177/001698628603000402

Marini, A., & Genereaux, R. (1995). The challenge of teaching for transfer. In A. McKeough, J. Lupart & A. Marini (Eds.), *Teaching for transfer: Fostering generalization in learning.* (pp. 1-19). Mahwah, NJ: Lawrence Erlbaum.

McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. New York, NY: Penguin.

Nagy, W. (2005). Why vocabulary instruction needs to be long-term and comprehensive. In E. H. Heibert & M.L. Kamil (Ed.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 27-44). Mahwah, NJ: Lawrence Erlbaum.

Redefining giftedness for a new century. (n.d.). [Position paper]. *NAGC.* Retrieved from http://www.nagc.org/sites/default/files/Position%20Statement/Redefining%20Giftedness%20for%20a%20New%20Century.pdf

National Reading Panel. (2010). A review of current research on vocabulary instruction. Shari Butler, S., Urrutia, K., Buenger, A., Gonzalez N., Hunt, M. & Corinne, E. (Eds.). Retrieved from http://www.ed.gov/programs/readingfirst/support /index.html

Nisbet, S., & Williams, A. (2009). Improving students' attitudes to chance with games and activities. *Australian Mathematics Teacher*, *65*(3), 25-37. Retrieved from http://www98.griffith.edu.au/dspace/bitstream/handle/10072/29460/57819_1.pdf?sequence=1

No Child Left Behind (NCLB) Act of 2001, Pub. L. No. 107-110, § 115, Stat. 1425 (2002).

O'Connell-Ross, P. (2003). Federal involvement in gifted and talented education. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (3rd ed.). Boston, MA: Allyn and Bacon.

Ready, T. (2000). *Grammar wars: 179 games and improvs for learning language arts*. Colorado Springs, CO: Meriwether.

Redding, R. E. (1989). Underachievement in the verbally gifted: Implications for pedagogy. *Psychology in the Schools, 26*(3), 275-291. doi:10.1002/1520-6807(198907)26:3<275::AID-PITS2310260310>3.0.CO;2-O

Renzuilli, J. S. (1982). Myth: The gifted constitute 3-5% of the population. In J. S. Renzulli (Ed.), *Identification of students for gifted and talented programs* (pp. 63-70). Thousand Oaks, CA: Corwin Press.

Renzulli, J. S., Smith, L. H. & Reis, S. M. (1982). Curriculum compacting: An essential strategy for working with gifted students. *Elementary School Journal, 82,* 185-194.

Rimm, S. (1984).The characteristics approach: Identification and beyond. In J. S. Renzulli (Ed.), *Identification of students for gifted and talented programs* (pp. 117-129). Thousand Oaks, CA: Corwin Press

Rimm, S. B. (1986). *Underachievement syndrome: Causes and cures*. Watertown, WI: Apple.

Salen, K., & Zimmerman, E. (2004). *Rules of play: Game design fundamentals*. Cambridge, MA: The MIT Press.

Sandberg, A. (2011). Play's importance in school. *Education, 39*(3), 317-329. doi:10.1080/03004270903530441

Sayler, M. F., (1999). American gifted education at the millennium: 150 years of experience. *Understanding Our Gifted, 12*, 11-15.

Scruggs, T. E., & Cohn, S. J. (1983). Learning characteristics of verbally gifted students. *Gifted Child Quarterly*, *27*, 169-172. doi:10.1177/001698628302700405

Sousa, D. (2009). *How the gifted brain learns* (2nd ed.). Thousand Oaks, CA: Corwin.

Squire, K. (2011). *Video games and learning: Teaching and participatory culture in the digital age*. New York, NY: Teachers College Press.

Terman, L. M. (1931). The gifted child. In C. Murchison (Ed.), *A handbook of child psychology* (pp. 568-584). Worcester, MA: Clark University Press .

Thorndike, R. L., Hagen, E. P., & Lorge, I. (1974). *Cognitive abilities test*. Houghton Mifflin.

Uguroglu, M. E., & Walberg, H. J. (1979). Motivation and achievement: A quantitative synthesis. *American Educational Research Journal, 16*(4), 375-389. doi:10.3102/00028312016004375

Van Tassel-Baska, J. (1989). Appropriate curriculum for gifted learners. *Educational Leadership, 46*(6), 13-15. Retrieved from http://login.ezproxy1.lib.asu.edu/

Webb, J. T., Meckstroth, E. A., & Tolan, S. S. (1982). *Guiding the gifted child*. Columbus, Ohio: Ohio Psychological.

APPENDIX A

WORD LISTS

Vocabulary List A
No Treatment

deviate	to turn aside from a course of action, line of thought
dispersed	to drive or send off in various directions; scatter
formidable	causing fear, dread, or awe
frenzy	wildly excited or enthusiastic
gait	a particular manner or moving on foot
murmur	a low, continuous sound, as of a brook, the wind, or trees, or of low indistinct voices
paltry	ridiculously or insultingly small
permeating	to pass through the holes, pores, or openings of
remote	far apart, located far away
unsubstantial	having no foundation in fact: lacking strength; flimsy

Vocabulary List B
Treatment/Game List

antagonistic	acting in opposition, hostile, unfriendly
appallingly	causing horror or dismay
consistent	in agreement; reliable; steady
furtive	done by stealth; sly, shifty
grimace	a twisting of the face showing pain, disgust, or displeasure
illuminate	to supply or brighten with light; light up
indignant	feeling characterized by or expressing strong displeasure
infinite	immeasurably great; unlimited
quivering	to shake with a slight but rapid motion; tremble
transparent	easily seen through

Vocabulary List C
Traditional Teaching

abruptly	sudden or unexpected
clamber	to climb, using both feet and hands; climb with effort or difficulty
eerie	so mysterious, strange, or unexpected as to send a chill up the spine
reiterating	to say or do again or repeatedly
resilience	the power or ability to return to the original form
somber	dark and gloomy
sparse	thinly scattered or distributed: not thick or dense; thin
spectacles	eyeglasses
wary	on guard, watchful
writhe	to twist the body about, or squirm, as in pain, violent effort

APPENDIX B

VOCABULARY TEST

Vocabulary Pre/Post Test

Match each word with the correct meaning.

1)	deviate	a)	done by stealth; sly, shifty
2)	eerie	b)	to drive or send off in various directions; scatter
3)	paltry	c)	immeasurably great; unlimited
4)	abruptly	d)	acting in opposition, hostile, unfriendly
5)	formidable	e)	the power or ability to return to the original form
6)	appallingly	f)	on guard, watchful
7)	spectacles	g)	ridiculously or insultingly small
8)	writhe	h)	far apart, located far away
9)	grimace	i)	so mysterious, strange, or unexpected as to send a chill up the spine
10)	frenzy	j)	to supply or brighten with light; light up
11)	somber	k)	to turn aside from a course of action, line of thought
12)	permeating	l)	sudden or unexpected
13)	clamber	m)	causing fear, dread, or awe
14)	remote	n)	a twisting of the face showing pain, disgust, or displeasure
15)	wary	o)	in agreement; reliable; steady
16)	dispersed	p)	a particular manner or moving on foot
17)	unsubstantial	q)	eyeglasses
18)	sparse	r)	feeling characterized by or expressing strong displeasure
19)	gait	s)	causing horror or dismay
20)	quivering	t)	thinly scattered or distributed: not thick or dense; thin
21)	reiterating	u)	a low, continuous sound, as of a brook, the wind, or trees, or of low indistinct voices
22)	infinite	v)	to twist the body about, or squirm, as in pain, violent effort
23)	antagonistic	w)	having no foundation in fact: lacking strength; flimsy
24)	indignant	x)	easily seen through
25)	illuminate	y)	to say or do again or repeatedly

26)	consistent	z)	wildly excited or enthusiastic
27)	transparent	aa)	to pass through the holes, pores, or openings of
28)	furtive	bb)	dark and gloomy
29)	murmur	cc)	to climb, using both feet and hands; climb with effort or difficulty
30)	resilience	dd)	to shake with a slight but rapid motion; tremble

APPENDIX C

PRE-QUESTIONNAIRE

Vocabulary Questionnaire

1. During which subjects is learning vocabulary usually a part of the lessons? Check all that apply.

   _____ reading _____ language/writing _____ math

   _____ science _____ social studies _____ other:

   _____

2. How do you usually learn new vocabulary words? Check all that apply.

   _____ worksheets _____ flashcards _____ games

   _____ other:
   _____

3. Do you like learning new vocabulary words? _____ yes _____ no

4. Do you use your **new** vocabulary words in your everyday:

   ____ speaking ____ whenever I can ____ sometimes _____ never

   ____ writing ____ whenever I can ____ sometimes _____ never

5. How do you feel about studying vocabulary in school?

   _____ I enjoy it _____ it's ok _____ I don't like it

6. Any other comments you have about learning vocabulary words in school.

   _____

   _____

   _____

   _____

APPENDIX D

POST-QUESTIONNAIRE

Vocabulary Game Questionnaire

1. Rank the games in order of your favorite to play, 1 being the best.
   (based on the game only, not if you got candy for winning or not)

_____ Bingo _____ Cranium _____ Bacon

Answer the following questions in complete sentences. Give specific information.

2. Tell why your #1 game was your favorite.

_____

_____

3. Why did you like playing Bingo?

_____

_____

4. How do you think Bingo helped you learn your vocabulary words?

_____

_____

5. Why did you like playing Cranium?

_____

_____

6. How do you think Cranium helped you learn your vocabulary words?

_____

_____

7. Why did you like playing Bacon?

_____

_____

8. How do you think Bacon helped you learn your vocabulary words?

_____

_____

9. Do you think that playing the games made you more aware of the vocabulary words?

_____ yes _____ no

Explain your answer:

_____

_____

_____

10. Do you like learning new vocabulary words?

_____ yes _____ no

11. Do you use your **new** vocabulary words in your everyday:

_____ speaking _____ whenever I can _____ sometimes _____ never

_____ writing _____ whenever I can _____ sometimes _____ never

12. How do you feel about studying vocabulary in school?

_____ I enjoy it _____ it's ok _____ I don't like it

13. Any other comments you have about learning vocabulary words in school.

_____

_____

APPENDIX E

WRITING PROMPTS

Writing Prompts

Directions for Writing Prompts. These were given before each writing session.

* Read the prompt carefully and write a response of at least one paragraph. Be sure to address everything that is asked.
* Be specific and use details.
* Skip lines when writing your first drafts.
* When finished, edit your first draft, making any needed corrections in pen.
    - § Spelling
    - § Punctuation
    - § Word choice (vivid verbs, interesting adjectives)
* Type your final draft on the computer and save in the folder marked Writing Prompts.

Prompt #1

An alien named Zub has landed in your backyard. You are taking Zub to school with you. Tell Zub about life on earth, especially about life at school.

Prompt #2

Imagine your perfect day from the moment you wake to going to sleep. Describe it and why it would make you happy.

Prompt #3

If you had a magic wand, tell me about someone's life you would really like to make better.

Prompt #4

Imagine an old lady who owns a fancy dress shop. It seems that everyone who hires a costume has an adventure based on it! Write about what happens.

Prompt #5

Bippity-bobbity-boo! Create your own fairy godmother. What does she look like? What does she have to offer you? Explain how she helps you. Describe her personality.

Prompt #6

Create a *super hero* that the world needs. Your super hero must be entirely original, unlike any super hero you know of who has ever been created before. Is the hero male or female? What special powers does he/she have? What problem will he/she solve for the world, or for a certain population of the world? Will the hero solve a really important problem, or just a smaller, annoying problem?

Prompt #7

Create a character named *Pat*. Who is Pat? You are creating him or her, so you decide.

How old is Pat? Who does Pat live with? What disappoints Pat? What recently made Pat unhappy? How unhappy? What does Pat like to do on Sunday afternoons?

Using what you know about Pat so far, describe Pat's meeting with *someone else* about *something, somewhere.*

Prompt #8

If you had a magic friend who was only five centimeters tall, how might this friend help you?

APPENDIX F

TRADITIONAL TEACHING ACTIVITIES

Matching

Match each word with the correct definition.

1) _____	abruptly	a	on guard, watchful
2) _____	clamber	b	dark and gloomy
3) _____	eerie	c	to say or do again or repeatedly
4) _____	reiterating	d	to twist the body about, or squirm, as in pain, violent effort
5) _____	resilience	e	thinly scattered or distributed: not thick or dense; thin
6) _____	somber	f	sudden or unexpected
7) _____	sparse	g	so mysterious, strange, or unexpected as to send a chill up the spine
8) _____	spectacles	h	to climb, using both feet and hands; climb with effort or difficulty
9) _____	wary	i	the power or ability to return to the original form
10) _____	writhe	j	eyeglasses

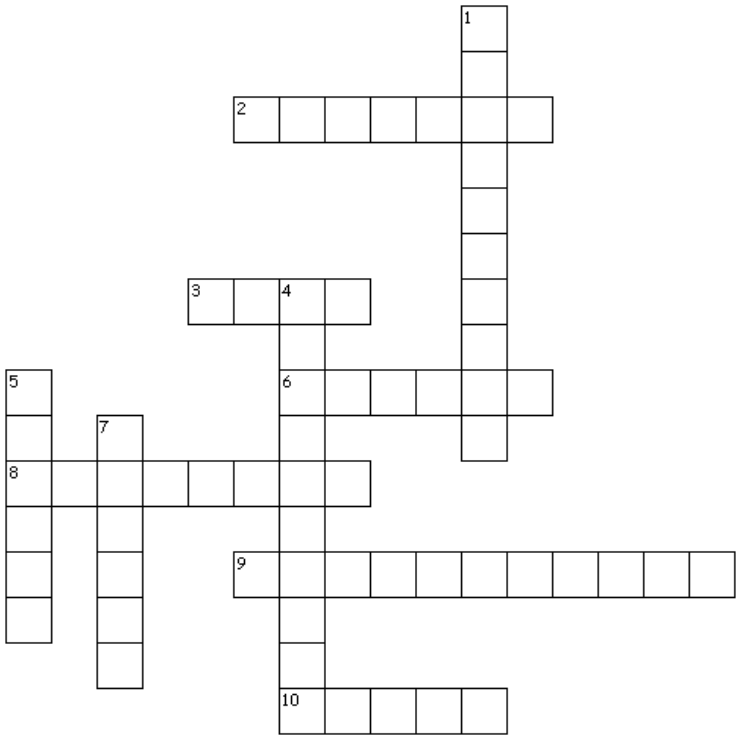
A Wrinkle in Time Vocab

O Y K J B Y S Z B M U P Z S I U L J K R
N J A C V L T E B R Z X Z Y R U X U L R
S F S Q Y T G O L E A F O Y U A B W H C
F K V E E P H E N C E K E B K H W Z W F
M I P K F U I B P E A S O M B E R A Z E
N U L U Y R A W R V R T P H V F G S G Y
J A U F C B K I L E J R C X M T Y U T I
G A Z F J A E Y I O L Y M E M L A E N B
A X U M N L G T Y V S W X O P X S O G Y
K J R K U X E C M B C T C T P S U R I J
H R T R R R V R D E F I B R U H H Y I Y
X T G N A L O Y S J G I J H E R W P Q J
L V H T T S Y G A P Q G P P E H R I F J
I O I W S V P H T W A H A B Q E I O W L
Y N E C N E I L I S E R M Y B A T Y B O
G E A N J E Q X Q M W A S D I O H M B R
H F I R F R I W L Z L R G E K B E R Q F
Z G E Z P X C S J C E R Z R C P K B C J
Z X C E T J R V V K X A N J A A Y L M D
L O I Z W S W Q N E H D V E Z I U V Q V

ABRUPTLY
CLAMBER
EERIE
REITERATING
RESILIENCE
SOMBER
SPARSE
SPECTACLES
WARY
WRITHE

Created by Puzzlemaker at DiscoveryEducation.com

Selected Wrinkle Vocabulary



Across
2. to climb, using both feet and hands; climb with effort or difficulty
3. on guard, watchful
6. dark and gloomy
8. sudden or unexpected
9. to say or do again or repeatedly
10. so mysterious, strange, or unexpected as to send a chill up the spine

Down
1. eyeglasses
4. the power or ability to return to the original form
5. thinly scattered or distributed; not thick or dense; thin
7. to twist the body about, or squirm, as in pain, violent effort

10 of 10 words were placed into the puzzle.

A Wrinkle in Time

Vocabulary Activity

Use each word in one of the sentences below. Each word may only be used once.

abruptly	clamber	eerie
reiterating	resilience	somber
sparse	spectacles	wary
writhe		

1. There will often be _____ music during the scary part of a movie.
2. The boy got new _____ and now he can read the board from his seat.
3. Mr. Dread is a very _____ and serious principal.
4. The dog was _____ of the new toy.
5. The grass in the front yard of the old house was _____.
6. The car stopped _____ at the intersection.
7. When the pig was shot with the arrow, it would _____in pain.
8. Ms. Ragatz does not like _____ the directions.
9. John had to _____ over the wall because he was being chased.
10. The teacher has a strong _____ and doesn't get sick.