SCAFFOLDING CONTENT-AREA VOCABULARY INSTRUCTION FOR ENGLISH

LEARNERS

by

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I dedicate this project to my husband, Charles.

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ABSTRACT

This study was a mixed methods design that investigated the benefits of instructing English Learners (EL) students in Tier Two academic vocabulary words. Research has shown the benefits of vocabulary intervention on comprehension for native English speakers; however, there is a necessity for more research on the benefits of vocabulary instruction for EL students in particular. This study was an experimental design and took place in 3 8th grade literacy classrooms. Students were randomly assigned to a treatment (*n*=12) or control group (*n*=12). The treatment consisted of vocabulary squares using eight strategies: (1) linking vocabulary with background knowledge, (2) utilizing semantic mapping, (3) restating dictionary definitions in their own words and making up sentences, (4) exploring synonyms and antonyms, (5) analyzing the word for affixes, (6) using words from context, (7) maintaining personal word lists, and (8) working cooperatively.

The control used the same passages as the treatment group, worked with the same Tier Two academic vocabulary words, but wrote entire dictionary definitions in their word banks instead of using the 8 strategies. The vocabulary intervention lasted for 3 weeks for 10-15 minutes a day. Growth of student vocabulary knowledge and comprehension for the treatment group was compared to the growth of student vocabulary knowledge and comprehension for control group receiving only definitional instruction. Results indicated that the treatment group made significantly more gains in vocabulary, and both the treatment and control group made gains in comprehension, and that these effects remain even after accounting for initial oral vocabulary levels. Three students (the highest scoring, the lowest scoring, and a student in the median) were

selected to participate in a Qualitative Interview regarding their histories and their

attitudes and values toward learning English. These interview results were used to assess

more deeply how these factors may affect student outcomes.

Keywords: EL, ESL, Tier Two Vocabulary, L1, L2 (See Appendix A)

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CHAPTER I

Introduction

The United States is currently, and always has been, a nation of immigrants, from the time the first Native Americans descended on foot in search of a more temperate physical climate, to modern day when refugees cross our borders in search of a more temperate political climate. Though the tide of immigration has ebbed and flowed over the centuries, in the early twenty-first century we face many dilemmas including how to support these new arrivals. For educators, one question remains at the forefront of our minds: How do we best instruct students who are not native English speakers in both the English language and academic content?

Growth in EL Student Population

The EL student population represents one of the fastest growing populations in American schools. According to Wiley and de Klerk (2010), there are currently more than 55 million people in the United States of America who speak a native language other than English. This growth has become apparent in American classrooms. In fact, according to the 2011 National Center for Educational Outcomes (NCEO) Brief, an estimated 9% of the population of public school children across the country is considered to be English Learners, or ELs (Davis, Liu, Lazarus, Thurlow, & Quenemoen, 2011). In the decade spanning from 1991 to 2001, Georgia officials estimated that the EL student population had grown 650% across the state (Batt, Kim, & Sunderman, 2005). Georgia's rapid growth reflects the growth in every state in the country. More and more teachers are being faced with how to best instruct a wide variety of students who come from many different countries, have many different cultures, and speak many different languages.

Difficulties Faced by EL Students

With this continued rise in population of immigrants into American schools, there have been many concerns about how best to teach these new arrivals English as a Second Language (ESL). Once they reach the classroom, too many of these immigrant children are failing classes and failing standardized measures, and many of these problems are likely the result of failing to learn to read English properly:

> About 80% of second-generation immigrant children, who by definition are native-born U.S. citizens, are what schools call long-term English learners. These students, who have been in U.S. schools since Kindergarten, are still classified as limited English proficient when they reach middle or high school-suggesting strongly that preschool and elementary programs are not adequately addressing the needs of English learners (Calderon, Slavin, & Sanchez, 2011, p. 104).

In 2005, the US Department of Education also expressed concern over weaknesses demonstrated by American middle school students, and ELs in particular. At the time of the analysis, both native speakers and EL students in American middle schools exhibited an inability to adequately learn from content-area texts, no change in the percentage of 8th graders scoring at or above proficient level between 1992 and 2005 on the National Assessment of Educational Progress (or NAEP), and unacceptable achievement gaps from various demographic groups (US Department of Education, 2005).

The first of these weaknesses is an inability of middle school students to learn from content area texts. One of the largest obstacles to these students, and to EL students in particular, is obtaining the needed skills in academic vocabulary. Research has indicated that gaps associated with reading performance between Anglo and Latino

children stem from vocabulary knowledge (Carlo, August, McLaughlin, Snow, Dressler, Lipman, Lively, & White, 2004). English language learners are typically about two years behind average first language students in vocabulary (Biemiller, 2007).Many EL students reach upper grades proficient in basic English, but the demands of comprehending middle school textbooks often proves a strain on their ability levels. Some students in urban middle schools have been found to struggle with the specialized language of text, which is yet another hindrance to comprehension for those students who may have already been struggling to understand the text (Kelley, Lesaux, Kieffer, & Faller, 2010).

Starting in 2009, the NAEP included a section on vocabulary. According to the results of the 2013 NAEP, students with low vocabulary in fourth grade also demonstrated the lowest scores on comprehension. Also troubling in the 2013 NAEP is that at each of the three grade levels the test is given, average vocabulary scores for Caucasian students and Asian/Pacific Islander students are larger than for Black, Hispanic, and American Indian students.

This deficiency in academic vocabulary can exist even if the EL students appear to be proficient in conversation. Middle school ELs might be capable of communicating in spoken English, but the demands to access content-area subject matter through academic English may strain their abilities as second-language readers because of their limited vocabulary knowledge (Denton, Wexler, Vaughn, & Bryan, 2008). Though these students often appear capable in conversational English, when they reach upper grades, content area texts provide a unique challenge to their academic vocabulary abilities (Beck & McKeown, 2007; Parry, 1993; Lesaux, Kieffer, Faller, & Kelley, 2010). This challenge results in part because EL students move through at least five stages of language

acquisition: (1) pre-production, (2) early production, (3) speech emergence, (4) intermediate fluency, and (5) advanced fluency (Hill & Flynn, 2008).

Frequently, content-area teachers overestimate EL ability by mistaking conversational English ability, or stages (3) and (4), for academic English ability, or stage (5) (Townsend & Collins, 2009). Other times content-area teachers underestimate content knowledge of EL students by equating lack of EL interaction in a classroom, with lack of EL knowledge in the content area. For example, an EL student may be well versed in his or her native language in the stages of photosynthesis, but the student may be in the pre-production stages of learning English, and therefore, the student may be unable to communicate his knowledge in a mainstream science classroom, which is taught only in English.

History of EL Instruction in the United States

Concern over how to educate the children of immigrants has been a question since the start of America. As Great Britain established worldwide trade networks in the 15[th]century, they employed teachers overseas to educate upper-class colonists (Cohen, 1974; Davis, 1954). By the 1700s, books were published in multiple languages to accommodate immigrants from England, Germany, and the Netherlands (Armory, 2007). However, the first academic readers to be distributed, such as the *New England Primer,* were only published in English (Reeder, 1900).

The late 1700s brought independence from Great Britain. Many of the founders of America believed the individual freedoms for which the nation was fighting included freedom of speech in any language (Genzuk, 1988). As a result, an official language of was never fully named.

In 1818, many immigrants were moving to large urban areas in which their languages thrived in neighborhoods. Because of the isolated nature of these communities, the language taught with English varied based on the geography of the school. This was accepted until post-Civil War America, when the need for a unified state, and therefore, a unified language was promoted. In 1855, the California Bureau of Instruction legislated that all instruction be in English only (Garcia, 2008). The rest of the nation followed suit.

In 1906, the Naturalization Act passed, which required all United States citizens to speak English (Genzuk, 1988). The influx of new immigrants in the early twentieth century created a mentality of the former immigrants versus the current immigrants (Genzuk), and in that struggle, English emerged as the common denominator that could separate the old from the new. This desire to speak English heightened during 1915 to 1918 as the United States entered World War I against Germany (Genzuk), and speaking English was seen as a way to unite Americans against a common enemy.

This English-only mentality continued into the 1920s. The Supreme Court case *Meyer v. State of Nebraska* (1923) reaffirmed a Nebraska policy that no person should teach any subject to any person in any language besides English (*Meyer v. State of Nebraska*, 1923) and "by the early 1920s, 34 states had English-only requirements in their schools" (Malakoff & Hakuta, 1990, p. 29).

Just after World War II the United States recognized the importance of foreign languages. This relaxation may have taken place due to a decline in immigration. "By 1950, only 8% of the total population was foreign-born, down from 15% in the early 1900s" (de Jong, 2011, p. 149).

From 1950-1965, Communism became a believed threat to Democracy, educators felt the effects of needing to create English-speaking Americans (Smith, 2002). In the post-Sputnik world, nationalism spread throughout the country, and education felt the weight of the new mentality (Smith). Reading instruction became competitive, test-driven, and in English-only (Malakoff & Hakuta, 1990).

When the United States started to examine the multitude of cultures needing education within its own borders, the country began to realize that not only was *Brown v. The Board of Education* (1954) important for the African Americans who worked so hard for it, but the legislation paved the way for other ethnicities to be able to demand an equal education not limited by their language. In 1964, the Civil Rights Act reversed the ruling of *Plessy v. Ferguson* (1896) in which the court had maintained that racial segregation was Constitutional (*Plessy v. Ferguson*, 1896; Mora, 2005). Ten years after the ruling, the 1964 Civil Rights law stated that education be provided for all, which came to include speakers of any native language.

The immigrant children who were struggling to keep pace in the classroom were granted some additional reprieve in 1968 with the passage of The Bilingual Education Act, which "provided funds to support a few bilingual programs which were to use native language and culture for instruction while the students were being taught English" (Genzuk, 1988, p. 6). Problems arose in the ability to enact the new law (Stewner-Manzanares, 1988) as districts wrangled over what manner of instruction would be adequate. Likewise, the law mandates "a program must be pedagogically sound for each LEP student, including assurance content area progress, not just English acquisition" (Genzuk, 1988, p. 6). States developed their own interpretations of the law some of which

pulled ELs out of classes with other native English speaking students and thus were in conflict with The Civil Rights Act by effectively re-segregating only this time with a different minority group: ELs.

In 1974, the 10th Circuit Court Appeals found that Spanish surnamed students' achievement levels were below those of their Anglo counterparts. The court ordered a bilingual/bicultural curriculum to assist students in obtaining both language and curriculum (*Serna v. Portales*, 1974). Four years later in *Rios v. Reed* (1978), the Federal District Court for the Eastern District of New York found that the Pastchogue-Medford School District's bilingual program was no more than an English course. This district was not providing sufficient content knowledge to ELs, thereby, going against the policy set forth in the Bilingual Education Act. *Plyer v. Doe* (1982) stated that a Texas statute that denied undocumented children a public-school education violated the 14th Amendment.

As a result of the many courtroom battles regarding how to best educate the EL population, there were a series of revisions to the Bilingual Education Act. It was no longer acceptable to instruct ELs in only the English language; schools were required to provide the same education to ELs as was provided to their English-speaking peers (Stewner-Manzanares, 1988).

The laws were on the books, and the precedents set for states to educate all children, native or not, legal or not, English-speaking or not, but some states continued to resist the national policy and to this day many states have English-only instructional policies that do not fully support the development of an L2 nor do they support obtaining content-knowledge in that L2.

Currently, immigrants and the children of immigrants are placed into English-only settings that do not support their native languages. Proponents of English-only instructional tactics ignore important information regarding the true nature of language in this country, where the "presence of over 55 million individuals who speak other languages indicates that the United States is more appropriately described as a multilingual nation in which English is the dominant language" (Wiley & de Klerk, 2010, p. 24). The US remains a country of multiple languages.

The struggle for control in EL classrooms continues to be a political and social issue, with un-researched opinions often guiding decisions. While previously, scientists thought being bilingual caused interruptions in the brain, we now know it leads to better problem-solving in addition to the added benefits bilinguals experience in being able to communicate with multiple cultures (Bhattacharjee, 2012). As a country, the US needed to develop a research-based perspective rather than a political one.

Since its inception, EL instruction has undergone many political and educational evolutions. These separate evolutions have led to bilingual classrooms, English-only classrooms, and EL pull-out instruction all being championed at various times and places. "ELLs whose English is not proficient enough to be immersed in mainstream classes are nevertheless mainstreamed, except for the pull-out English as a second language (ESL) class" (Brown, 2007, p. 32). EL students are therefore exposed to academic discourse and content-area texts before they are fully prepared to do so. Because of this continuous uncertainty in how to best instruct EL students, content-area teachers need research-based strategies to provide effective instruction to the diverse members of their classrooms

(Brown, 2007; Calderon, et al., 2011; DeLuca, 2010; Cunningham & Moore 2004; & Carlo, August, McLaughlin, Snow, Dressler, Lipman, & Lively, 2004).

Native English Speaker Vocabulary

The debate is not simply over how best to instruct EL students in academic vocabulary in order to improve student comprehension. Native English speakers can also struggle with academic vocabulary when reading. Both Alverman and Swafford (1989) and Swafford and Hague (1987) focused on the necessity of teaching content vocabulary to native English speakers, emphasizing the importance of vocabulary for comprehension.

Researchers have agreed on the important role vocabulary plays in comprehending texts; however, researchers have not always agreed in how best to teach this vocabulary to children. For years researchers have been debating the merits of learning this academic vocabulary from direct instruction (Calderon, et al., 2005; Beck, McKeown, & Kucan, 2008; Beck, McKeown, & Kucan, 2013) versus learning from context (Beck, McKeown, & McCaslin, 1983; Nagy, Herman, & Anderson, 1985; Nagy & Scott, 2001; Rieder, 2005, Brown, Waring, Donkaewbua, 2008) of selecting the best vocabulary for instruction (Beck, et al., 2013; Marzano & Pickering, 2005), and of teaching a sufficient amount of words enough to affect comprehension (Beck, Perfetti, & McKeown, 1982; Bos & Anders, 1990; Mezynski, 1983; Stahl & Fairbanks, 1986).

Context

Many researchers believe that one of the primary manners through which native English speaking students acquire new vocabulary is through context. Nagy and Anderson (1984) estimated that printed school English contains 88,500 words. Because

of the time constraints of the academic school year, the two researchers argued that school children would be unable to learn that volume of vocabulary through direct instruction. A year later, Nagy, et al., (1985) purported that "incidental learning from context during free reading is the major mode of vocabulary acquisition during the school years, and the volume of experience with written language, interacting with reading comprehension ability, is the major determinant of vocabulary growth" (p. 234). The researchers believed that learning academic vocabulary from context was the only possible explanation for the volume of vocabulary learning that goes on during a child's school years.

Stanovich (1986) expanded on this concept of children obtaining vocabulary from context to a greater extent when he proposed the "Matthew effect." Stanovich determined that because good readers read more, they continuously improve in areas of comprehension and vocabulary, while the inverse is true for poor readers. Unfortunately, EL students, like many of the poor readers to which Stanovich was referring, often do not possess the literacy skills necessary to become richer in vocabulary only through reading (Vadasy, Nelson, & Sanders, 2011). Likewise, Soltani (2011) acknowledged that vocabulary is the most critical element in foreign language learning, and he used extensive reading to attempt to improve the vocabulary of 40 EL students between the ages of 17 and 27. Soltani's students made significant gains on vocabulary through the extensive reading program, leading him to propose that extensive reading should be one necessary component in a broader EL literacy curriculum.

Rieder (2005) acknowledged that while students acquire some vocabulary incidentally through reading, many students, ELs in particular, simply ignore words that

are unfamiliar to them within a text. Rieder proposed students need numerous exposures to vocabulary words through explicit instruction to truly acquire new language. Unfortunately, this is especially true for EL students, who tend to have low levels of English vocabulary, which could make inferring from context even more difficult than it is for native speakers.

Explicit Teaching of Vocabulary

In a similar vein to Stanovich's "Matthew effect," Baker, Simmons, and Kameenui (1998) identified that "one of the most alarming findings is that vocabulary differences between students appear early and the vocabulary gap grows increasingly large over time" (p. 191). However, the researchers also determined that it was only the already talented readers who were skilled enough to infer meanings from context. Therefore, students with limited English proficiency would also be unlikely to obtain adequate vocabulary knowledge merely from exposure to academic vocabulary in context through independent reading.

Beck, et al., (1983) also argued against context as the sole instructional method stating that context was unable to provide sufficient information to learners. With an eye of the differences between pedagogical contexts versus natural contexts, the researchers identified four types of contexts in texts: misdirective contexts, nondirective contexts, general contexts, and directive contexts. The only one of these contexts that provides sufficient scaffolding for learning a newly encountered word's meaning is directive context. Because of this lack of sufficient contextual information to guide students' vocabulary development, Beck, et al., championed direct instruction of vocabulary.

In order to combat these uncertainties of students learning vocabulary through context, Beck, et al., (2013) created the concept of robust vocabulary instruction. The instruction begins with the students encountering a vocabulary word in text. Next, the teacher provides a student friendly definitions to students. Students then utilize the word in a variety of ways, including speed games where students play with the nuances of the words. Beck and McKeown (2013) later utilized these strategies to produce significant gains in oral vocabulary for young students.

In their attempts to improve the vocabulary of students, Kelley, et al., (2010) reiterated the importance of Beck's model. The researchers made gains with students by focusing on teaching a few words deeply, focusing on Tier Two words, and directly instructing students in vocabulary and tools for word learning.

Definitional Instruction

Though seen to be effective (Beck & McKeown, 2013), many literacy teachers express concern over the time constraints of programs like Beck's robust vocabulary instruction. Academic content area teachers often provide even less structured vocabulary instruction than their literacy counterparts (Bos & Anders, 1990). "Strategies that teachers report to be usable for vocabulary instruction are derived from their general declared theoretical orientation toward instruction, either skills and text based (e.g. find a definition) or those implying more interactive learning (e.g. mapping, webbing)" (Blachowicz & Fisher, 2001, p. 508).Similarly, Lenski, Daniel, Ehlers-Zavala, and Alvayero (2004) found that several possible phenomena contributed to the lack of success of ELs in the content area classrooms, the greatest of which the researchers purported is "lack of information and training of the regular education teachers to deal with the needs

of diverse learners" (p. 24). These content area teachers often rely on definitional

instruction, having students copy definitions from the text or from the dictionary, and

generally believing this is increasing student knowledge when some researchers have

discovered otherwise (Bos & Anders, 1990).

      Some evidence does exist that vocabulary instruction at any level improves

comprehension. In a meta-analysis of 37 vocabulary intervention studies, Elleman, Lindo,

Morphy, and Compton (2009) found that vocabulary instruction in any form improves

comprehension. The meta-analysis revealed that the teaching strategy used to instruct

students in vocabulary did not matter. The researchers determined it was the focus on the

words in any form that benefitted students.

What Words to Teach

      In addition to debating how to best teach vocabulary to students, researchers have

also examined which words to teach. In order to address this question, Beck, et al., (2013)

divided English vocabulary into three tiers. Tier One words consist of everyday

vocabulary (i.e. *table, cat, student*). Tier Two words consist of generalized academic

terms (i.e. *infer, persuade, confirm*), and Tier Three words consist of content-specific

vocabulary (i.e. *photosynthesis*). Beck and her colleagues argued that students generally

obtain Tier One words through conversation and through reading. The researchers stated

that Tier Three words are too specific to academic content areas to receive focus from the

literacy teachers. Beck, et al., (2010) suggested that students would receive the most

benefits in vocabulary and comprehension from instruction in Tier Two vocabulary

words, which can appear across content area texts.

Using a qualitative design model, Broer (2003) attempted to create a collaborative model between content area teachers and ESL teachers. In the model, the researcher noted the importance of vocabulary, in particular, the importance of connective language that often does not receive attention in the academic classroom.

Tier One words are often taught in ESL instructional classes. Tier Three words are encountered when the EL student is immersed in the content area classes. Therefore, a gap remains of vocabulary in which EL students never receive direct instruction. Intervention focusing on Tier Two words would provide the most scaffolding to assist EL students with comprehending the complex texts required of academic classes.

How to Teach

The Beck, et al., (2013) robust instruction is perhaps an ideal scenarios in vocabulary instruction, most especially for students with limited English proficiency. If teachers are able to expend the extensive classroom and planning time necessary to implement the strategies fully, students could make gains in both academic vocabulary knowledge as well as comprehension. However, many academic content-area teachers feel they have sufficient time to invest in such intensive vocabulary instruction.

ELs from childhood through adulthood

Because of the extensive timeline to full acquisition of the English language, problems with vocabulary affecting comprehension can occur in ELs of all ages. Therefore, researchers have devised strategies to improve vocabulary knowledge for children in prekindergarten through adulthood. In order to determine what may work best for middle school students who are ELs, it is important to see what researchers have attempted with ELs of all ages.

In an attempt to understand the variability in English language knowledge in native English speaking students who enter the American school system, Hart and Risley (1999) conducted a three year longitudinal study, focusing on the differences in student vocabulary knowledge for children from three levels of socioeconomic status. Hart and Risley (1999) found that as a result of mother-child interactions, students from low socioeconomic backgrounds may arrive at school with a deficit in vocabulary knowledge. This lack of vocabulary knowledge causes native English speaking students to fall behind in the classroom, and the situation is only aggravated for EL students who can also enter classrooms with even less knowledge of English vocabulary than their native English speaking peers (Graves, August, & Mancilla-Martinez, 2013).

Because of this potential deficiency in vocabulary, other researchers have attempted to intervene as early as possible with EL students. Silverman and Hines (2009) designed a vocabulary intervention for 85 participants in the study who were pre-kindergarten, kindergarten, first grade, and second grade students. Native languages (or L1s) of the students included Haitian, Creole, Portuguese, Mandarin, and Spanish. The intervention lasted for 12 weeks with instruction occurring 3 days a week for 45 minutes a day. Students in the treatment group received vocabulary instruction through read alouds that included multimedia components, while students in the control group received instruction through a traditional read aloud that did not include the multimedia components. There were no significant differences for native English speakers between the two approaches, but ELs benefited more from the multimedia approach.

Vadasy, et al., (2011) also attempted to intervene with kindergarten EL students by providing vocabulary intervention in Tier Two academic vocabulary words. The

researchers were concerned with the longer term effects of vocabulary intervention designed to develop root word knowledge and beginning word reading skills for the study's participants ($n = 74$ treatment, $n = 66$ control). Students in the intervention group demonstrated statistically significant growth on proximal vocabulary, distal vocabulary, and word reading, and the effects were still present six months after the intervention concluded. Treatment was provided to students in small groups, and the researchers note the importance of the small group instructional setting effecting vocabulary outcomes in their discussion. Vadasy, Nelson and Sanders also noted that though some researchers believe students must acquire vocabulary through reading, it is important to address the needs of younger ELs who may not possess the literacy skills necessary to acquire English vocabulary while reading texts.

Similar to the Vadasy, et al., (2011) study which focused on young ELs, Spycher (2009) developed an intervention in academic vocabulary for kindergarten students who are ELs. Unlike, the Vadasy, Nelson, and Sanders study, which focused on Tier Two general academic vocabulary words, Spycher focused on Tier Three academic vocabulary words through science curriculum. The Spycher study compared the benefits of intentional vocabulary instruction versus implicit vocabulary instruction. The five-week study focused on 20 academic vocabulary words from the student's science textbook. The control group received the standard science curriculum while the treatment group received explicit vocabulary instruction. The intervention group demonstrated greater growth on the target words than the control group, and the treatment group better expressed their understanding of science concepts through oral interviews.

Also concerned with the effects of EL students falling behind in elementary school, Kim and Linan-Thompson (2013) created an intervention for third grade EL students with learning difficulties. Students in the study ($n = 4$) first received direct vocabulary instruction to establish a starting point. The students then received intervention in self-regulation. The self-regulating strategy focused on improving science vocabulary knowledge. Students in the self-regulation phase of the intervention demonstrated statistically significant growth in both receptive and expressive vocabulary. Students also expressed a preference for the self-regulation strategy over the direct vocabulary instruction.

On the other end of the spectrum from those researchers studying early ELs and how best to intervene in their understanding of academic vocabulary, researchers are also focusing on adult ELs and how best to provide vocabulary instruction to those students. Brown and Perry (1991) compared three learning strategies for adult ESL vocabulary acquisition: the keyword method, a semantic feature strategy, and a combined keyword-semantic feature strategy. Students received four days of instruction and were tested one day after the intervention and nine days after the intervention. Gains were greatest for students in the combined strategy intervention.

Middle School ELs

Comprehension. Problems with vocabulary knowledge exist for children to adults, but as stated in the introduction, middle school ELs face the unique problem of transitioning from learning to read to reading to learn. This lack of vocabulary knowledge affecting comprehension is most aggravated in the late elementary years and middle school when students are asked to read and comprehend content area texts. Pullin,

Tuckwiller, Konold, Maynard, and Coyne (2010) suggested "vocabulary knowledge has long been acknowledged as a cultural component of both learning to read and reading to learn" (p. 110). Similarly, Biemiller (2006) acknowledged that "the absence of written word recognition or adequate vocabulary ensures a low level of reading comprehension" (p. 41). In a similar vein, Carlo, et al. (2004) found that "lack of knowledge of the middle- and lower frequency 'academic vocabulary' encountered in middle and secondary school texts impedes comprehension of those texts" (p. 58). When students enter the late elementary years, this lack of adequate vocabulary becomes apparent when students are asked to read informative texts and gain content knowledge from these texts and are unable to do so.

Brown (2007) suggested that the inability to comprehend complex texts results from EL students lacking three things: background knowledge, vocabulary, and the ability to access densely packed items in these content-area texts. Brown also discussed the differences between academic English and conversational English and the average time an EL student spends acquiring each. Conversational English can be acquired in two to three years, while academic English takes five to seven years. Other researchers also estimated that ELs can require up to seven years in academic setting to become fully, academically, proficient in English (Gass & Selinker, 2008). If a middle school, content-area teacher does not fully understand the stages of English language acquisition and the timeframe involved for students to move from conversationally proficient to academically proficient, the teachers may misidentify EL ability levels simply because the EL does not fully understand the academic discourse, even though they may understand the underlying concepts.

Because of the difficulty in obtaining academic English proficiency, some researchers have even termed Academic English as these students third language (DeLuca, 2010).Colombo and Fontaine (2009) analyzed teaching vocabulary strategies within middle school social studies classrooms. Colombo and Fontaine (2009) found that ELs "most often used vocabulary words purposefully and meaningfully when tutors scaffolded development" (p. 51). This scaffolding of academic vocabulary is imperative for EL student understanding. However, Hill and Flynn (2008) observed that content-area teachers lack the training, and therefore often the confidence, to provide adequate instruction to EL students in their mainstream classrooms. Likewise, Yoon (2007) observed that many ELs are unintentionally marginalized within mainstream classrooms. "ELLs English proficiency is a major indicator of their participation in literacy activities" (p.216). The situation is worsened by the fact that content area teachers often spend an average of only 10% of class time instructing in academic vocabulary, and this instruction often focuses on academic terms unique to that content area teacher's subject matter (Kelley, et al., 2010). Their lack of academic English can potentially lead EL students to participate less in the content area class and therefore learn less of the academic content. Content area teachers need to be taught how to accomplish this scaffolding in their own classrooms.

Assessment. As for failing standardized measures, based on what researchers know about the development of academic vocabulary, ELs are tested too soon. As of 2011 in the state of Tennessee, ELs must take the English Language Development Assessment (or ELDA), which is a modified version of the Tennessee Comprehensive Assessment Program (or TCAP). ELs must also take the Math and Science TCAP.

Scores can be exempt for the first year the EL is in an American classroom (Lanier, 2011), but after the first year, ELs must take the same standardized assessments as their native English speaking peers, though it can take up to seven years for an EL student to become academically proficient in English (Gass & Selinker, 2001).

Once these assessments are given, the results are often misunderstood. EL students may score lower than their English speaking peers, but these scores do not always reflect a lack of ability on the part of the EL students. Scoring differences on standardized assessments between native English speakers and EL students can also be attributed to lack of academic vocabulary knowledge (Donahue, Finnegan, Lutkus, Allen, & Campbell, 2001; Lenski, Daniel, Ehlers-Zavala, & Alvayero, 2004). Many times, EL students have difficulties understanding the questions being presented to them in the classroom and on assessments (Cunningham & Moore, 1993), and the texts accompanying these questions present an even greater challenge. Cunningham and Moore (1993) found evidence of the necessity for EL students to possess high levels of academic vocabulary when simply attempting to comprehend questions. Lenski, et al., (2004) attributed ELs lack of success on assessments to a combination of the cultural bias of assessments and the impossibility of differentiating between student skill in subject areas and student English ability. ELs also face difficulty in interpreting items either literally or figuratively. Students who are EL may read more slowly than their native speaking peers and therefore be unable to complete the assessment in the time provided. Additionally, not all cultures ask questions similarly, and even if students do speak the same language, linguistic variations may exist even within the same language that could affect student outcomes. Standardized tests are normed for native speakers and not for

ELs, which can result in scores being interpreted on a scale that was not created for EL students. This misinterpretation then leads to the larger effect of learning difficulties become confused with learning disabilities, leading to an over-representation of ELs in exceptional education classrooms. Few researchers have created strategies for the improvement of academic English vocabulary for ELs (Garcia, 2000), which could improve comprehension of academic texts and assessments. These middle school students need intensive, research-based instruction in academic vocabulary in order to become successful in the content-area classroom. The first three research questions in this study will address this issue.

Finally, because quantitative research does not always adequately address the multi-dimensional nature of the EL students in the American classroom, it is helpful to add a qualitative component to the quantitative studies. This mixed method allows for researchers to question beyond the numerical data and address the histories of these multi-faceted EL students. Lewis, Enciso, and Moje (2009) note the importance of student histories and student attitudes and values when addressing current student knowledge and success. After all, "how we feel about what we are learning is as important as what we are learning," (p. xvii). Therefore, a Qualitative Interview was designed as a part of this study in attempt to decipher individual student histories and individual student attitudes and values regarding English acquisition. The final research question will address this issue.

Purpose of this Study

The purpose of this study is to test a method of Tier Two vocabulary instruction in three eighth grade literacy classrooms to improve EL vocabulary knowledge and comprehension of science texts.

This study builds on previous literature by providing a mixed methods design (Gall, Gall & Borg, 2007) focused solely on Tier Two academic vocabulary. This study will provide a tool for content-area teachers to use in their everyday classrooms without requiring extensive of literacy knowledge on the part of the teachers and without requiring any special tools or technology.

The study will also consider how students' English receptive vocabulary affect outcomes on both Tier Two vocabulary and comprehension of science textbooks.

Specifically, the following Quantitative questions will be addressed:

(1)   Will the use of vocabulary squares intervention increase the academic vocabulary knowledge of 8th grade students who are EL?

(2)   Will the use of vocabulary squares intervention focused on Tier Two academic vocabulary increase the comprehension of science texts for 8th grade students who are EL?

(3)   If the intervention is effective, will the effects differ based on a student's PPVT-IV score?

The following Qualitative question will be addressed:

(4)   Based on the results of a Qualitative interview, can any similarities and

differences be found among the students regarding daily language use,

attitudes, and values?

CHAPTER II

Review of Literature

American schools have one of three systems for educating EL students in English as well as the content areas: pull-out English instruction (generally English instruction is provided during the student's literacy class), full immersion in English (no instruction is provided to EL students), or some gradation of bilingual education (classes range from fully bilingual to occasionally translating elements into the student's native language). In both the pull-out and the full immersion scenario, EL students immediately enter content area classrooms without any specialized instruction, generally receiving the same instruction as their native-English speaking peers.

As stated in the introduction, one of the largest problems facing EL students as they enter these content-area classrooms is their lack of academic vocabulary. If pull-out instruction is provided, EL students generally receive instruction in Tier One Vocabulary during the pull-out sessions, but then students must return to the general education classrooms and attempt to comprehend the content provided in Tier Three vocabulary. EL students do not have the chance to bridge the gap between what is taught in the pullout sessions and the content area classes.

This lack of academic vocabulary leads to students being unable to comprehend academic, content-area texts, and the lack of academic vocabulary knowledge can eventually lead to student failure. A number of researchers have examined how best to increase this academic vocabulary in EL students in order to provide the best instruction and thereby allow ELs access to the same academic content received by their native-English speaking peers.

The primary emphasis of this current study will be academic vocabulary intervention for ELs. Therefore, it is necessary to evaluate what previous researchers have accomplished in instructing ELs in academic vocabulary.

In order to determine what previous researchers had attempted in the area of EL academic vocabulary, a search was conducted to identify previous experiments in improving academic vocabulary for ELs. The initial search of the literature regarding academic vocabulary instruction for ELs contained journal articles, reports, and conference papers. Terms used to search educational databases were *ESL, ELL, EL, middle school*, *vocabulary,* and *intervention*.

Table 1
Primary Studies

Study	Intervention	Grade	Student Description	Native Language	Hours	Vocabulary Focus	Standardized Measure	Standardized Effect	Researcher Designed Measure	Researcher Designed Effect
August, Branum-Martin, Cardenas-Hagan, & Francis, 2009	QuEST-Science knowledge & academic language	6	562 ELs, 328 English proficient	Various	9 weeks, 5 times per week, 40 min	135 AWL	GRADE Assessment Form A, Level M Vocabulary Comp.	N/A	Vocabulary	ELs-g=.26
									Science Knowledge	ELs-g=.16
Carlo, et al., 2004	Context clues, morphology, multiple meanings, & cognates	5	142 ELs, 112 Native English speakers	Various	15 weeks, 4 times per week, 30-45 min	150 Tier Two	PPVT-R	N/A	Polysemy Production	$\eta^2 = .05$
									Reading Comp.	$\eta^2 = .08$
									Word Mastery	$\eta^2 = .34$
									Word Assoc.	$\eta^2 = .05$
									Morphology	NS
Denton, Anthony, Parker &	Read Well-phonics & decodable	2-5	93 students	Spanish	10 weeks, 3 times	Not stated	WRMT Word ID	Read Well-p=.023, $\eta^2 = 0.16$	N/A	N/A

Study	Intervention	Grade	N	Language	Duration	Category	Measures	Effect size		
Hasbrouck, 2004	text v Read Naturally-repeated reading & context vocab.				per week, 40 min		Word attack Comprehension	Read Naturally No effect		
Denton, Wexler, Vaughn, & Bryan, 2008	Explicit phonics instruction with comprehension, vocabulary, and fluency	6-8	20 TX 18 control	Spanish	13 weeks, 5 times per week, 40 min	All	PPVT WJ-III DIBELS TOWRE (Sight word efficiency subtest)	N/A N/A N/A $\eta^2 = .104$	N/A	N/A
Lara-Alecio, Tong, Irby, Guerrero, Huerta, & Fan, 2012	Inquiry-based learning with direct & explicit vocabulary instruction	5	166 TX 80 control	Spanish-dominant	85 min per day for a year	Not Stated	Texas Assessment of Knowledge and Skills: Science: Test 2 Test 4 Test 6 Reading: Test 2 Test 4	*Cramer's V=* 0.18 0.19 0.20 0.24 0.16 0.21	N/A	N/A

Study	Description	Age	Sample	Language	Duration	Tier	Measure	Result	Measure 2	Result 2
							Test 6 DIBELS			
Lee & Muncie, 2006	Attempted to increase student productive vocabulary in writing tasks	13-16 yrs	48 EL	Various	3 sessions	Tier Two Tier Three	Gates-MacGinitie Reading Vocab Comp	No effect stated $p = .0005$ $p = .015$	Writing Task-Target words produced Version 1: 2 Version 1: 3 Version 2:3	No effect stated $p=.01$ $p=.01$ $p=.05$
Lesaux, Kieffer, Faller, &Kelley, 2010	Multiple exposures to words in different forms in different contexts.	6	346 ELs, 130 Native English speakers	Various	18 weeks, 4 times per week, 45 min	AWL	SAT Vocabulary Gates-MacGinitie Reading Comprehension	No effects $d = 0.15$	Target Word Mastery Morphological Awareness Word-Meanings-in-Context Word Knowledge	$d = 0.39$ $d = 0.20$ $d = 0.20$ $d = 0.15$
O'Hara & Pritchard, 2008	Hyperlinking of words and images	6-7th	40 ELs	Spanish	Not stated	20 Tier Three	Vocabulary Mastery	No effect stated	Power Point Rubric	No effect stated
Proctor, Dalton, &	Vocabulary support &	4th	16 ELs, 14 Native	Spanish	4 weeks,	Not stated	Gates-MacGinitie	Non-significant	N/A	N/A

Grisham, 2007	embedded strategy instruction for ELs & struggling readers		English speakers		3 times per week, 45 min		Vocabulary and Comprehension	gains		
Rivera, Wood, & Spooner, 2012	Spanish v English vocabulary instruction	2-5th	3 ELs	Spanish	10 weeks, 3 times per week, 12 min	100 Tier One	N/A	N/A	English model-lead-test Spanish model-lead-test	No effect stated
Short, Fidelman, & Louguit, 2012	Sheltered Instruction Observation Protocol (SIOP)	6th-12th	TX 10,000 Control 6,000	Various	2 years	Not stated	IPT: Writing Reading Oral language Total English	$d = 0.31$ $d = 0.16$ $d = 0.29$ $d = 0.23$	N/A	N/A

Study	Intervention	Grade	Sample	Language	Duration	Words	Standardized Test	Effect (A/B)	Measures	Results
Taboada & Rutherford, 2011	Compared comprehension strategies with intensified vocabulary instruction	4th	20 EL	Spanish	8 weeks	104 Tier Three	N/A	N/A	Academic Vocab. Reading Comp. Expository Writing	No effect stated
Townsend & Collins, 2009	Language Workshop based on Beck	6th-8th	37 EL	Various	5 weeks, 4 times per week, 75 min	60 Tier Two	PPVT-III	.18 (A) No effect (B)	Measure of Academic Vocabulary (MAV) Target Words Vocabulary Levels Test (VLT)	*partial η^2* = 0.15 $d = 0.71$ No effect
Vaughn, Martinez, Reutebuch, Carlson, Thompson, & Francis, 2010	Compared two intervention studies for social studies vocabulary	7th	$n = 381$ $n = 507$	Not Stated	9-12 weeks, 5 times per week, 50 min	Not Stated	N/A	N/A	CBM Comp. Vocabulary	Study 1: $g = 1.12$ $g = 0.53$ Study 2: No effect stated

Initially, only those interventions that took place in a middle school classroom were considered for inclusion; however, this limitation provided only three intervention studies, so the search criteria was widened to include upper elementary (fourth grade) through high school (twelfth grade) intervention studies because these are the grade levels when students are required to learn from reading content textbooks. No limit was placed on native language spoken by the EL students. No was any limit placed on the type of intervention provided. No limit was placed on the vocabulary type emphasized during the study, though vocabulary had to be the focus of the intervention.

Studies that were reviewed for this proposal were primary sources and had an experimental, quasi-experimental design, or single-subject design with a control period. Such limitations were enacted in this review to ensure a control group was used by the researchers. Use of a control group helps control for extraneous variables that could account for the results (Gall, et al., 2007). As a result of this search, fourteen studies (see Table 1) were found that attempted to intervene with and build EL student vocabulary.

August, et al., (2009) investigated the effects of Quality English and Science Teaching (QuEST) on sixth grade students. The intervention took place in 20 sixth grade science classrooms across one district. Teachers taught QuEST curriculum to two of their classes and the standard science curriculum of the district to two of their classes. The QuEST curriculum was created to develop both the science content knowledge and the academic language of middle school students who are ELs studying alongside their native English speaking classmates. The QuEST intervention provided instructional materials and professional development for hands-on, inquiry-based instruction. The intervention was intended to use the Five E model: engage, explore, explain, extend, and

evaluate to improve the language and science knowledge of students. After the nine-week study, treatment effects were determined for both science knowledge and academic vocabulary knowledge, and students in the treatment condition demonstrated significantly higher gains than those in the control group. The researchers wanted to design an intervention that was effective for students who are ELs and for native English speakers. Students of both groups demonstrated small to moderate growth in science content knowledge: sample- g =.15-.24 and ELs- g =.16-.25.Students from both groups demonstrated moderate growth in vocabulary: sample- g =.28-.37 and ELs- g =.26-.37. Therefore, the researchers contended that the intervention provided would be beneficial to students regardless of language status.

Carlo, et al. (2004) examined the effects of vocabulary instruction on student comprehension. The researchers hypothesized that middle school ELs have a lack of knowledge of lower frequency academic words encountered in secondary level texts which hinder their comprehension. The intervention focused on instructing students in Tier Two academic words found within high interest texts. Students in the study were fifth grade ELs and native English speakers. The study lasted for 15 weeks, and intervention, which taught students word analysis and word learning strategies, took place 4 days a week for 30-45 minutes a day. Students in the intervention groups showed positive gains on both comprehension and vocabulary with an effect size of $\eta^2 = .08$ for reading comprehension and an effect size of $\eta^2 = .34$ for word mastery. Effect size estimates the magnitude of the effect in the population being studied (Gall, Gall, & Borg, 2007, p. 143). ELs made gains equivalent to that of native English speakers, but ELs were lower on all pre-tests and post-tests.

Denton, Anthony, Parker, and Hasbrouck (2004) compared the effects of two tutoring programs on the English reading development of Spanish-English bilingual students. The study investigated students in second through fifth grades ($n = 93$). One group ($n = 51$) received systematic phonics instruction using decodable text (Read Well), while the other group ($n = 42$) received instruction that included repeated reading, contextualized vocabulary, and comprehension strategies (Read Naturally). Students in the Read Well group made gains in word identification, with 16% of the variance in word identification growth attributable to the group. Students in the Read Naturally group demonstrated no significant gains on word identification, word attack, or passage comprehension. The researchers concluded that students who are ELs, who receive direct instruction made gains in English decoding in a short study.

Denton, et al., (2008) provided intervention in phonics augmented with vocabulary, fluency, and comprehension to linguistically diverse middle school students with reading disabilities. The researchers attempted to address the unique challenges of ELs with reading difficulties for "not only are they struggling with word reading, but they also have difficulty with word meaning" (p. 3). Participants in the study were sixth through eighth graders ($n = 38$). Students in the study were both ELs and were diagnosed as having learning disabilities. The daily, 40-minute intervention took place for 13 weeks. Ten hours of professional development were provided to the teachers in the study. The treatment did not result in significant gains on word recognition, comprehension, or fluency for students in the treatment group. The researchers attribute this lack of gains to the stabilizing nature of enrolling in a special education class can have on some students.

The researchers also concluded that the outcomes could be influenced by student characteristics, instructional factors, and contextual factors.

Lara-Alecio, Tong, Irby, and Guererro (2013) analyzed the effects of instructional intervention on middle school English learners' Science and English reading achievement. Participants in the quasi-experimental study were fifth graders, with a treatment group ($n = 166$) and a control group ($n = 80$). The researchers determined three guiding principles to their project which included (a) appropriately certified teacher with adequate professional development, (b) bilingual paraprofessionals, and (c) enhanced curriculum. Therefore, students in the treatment group received inquiry-based instruction along with explicit vocabulary instruction. Students in the treatment group also received additional technology support as well as the support of university professors who served as mentors for the students. The intervention resulted in statistically significant gains for the treatment group on state assessments.

Having identified the need for students to move from conversational proficiency to academic proficiency, Lee and Muncie (2006) worked with 13 to 16 year old EL students. The researchers' vocabulary intervention focused on moving advanced vocabulary from students' receptive vocabulary (understood during spoken conversation) to their productive vocabulary (produced when writing). The intervention used interactive vocabulary teaching, a writing frame to guide student writing, and specific instruction to the students to use the vocabulary words. The students in the treatment ($n = 59$) spoke various native languages and were of various grades. The students made positive gains on a post-assessment, writing task, and the positive gains remained on a delayed post-assessment.

Lesaux, Kieffer, Faller, and Kelley (2010) used a quasi-experimental, mixed methods approach to examine the effects of an academic vocabulary intervention. The study took place in urban middle school classrooms ($n = 21$) with participating sixth graders ($n = 476$), ELs ($n = 346$) and native English speakers ($n = 130$). The intervention lasted for 18 weeks. The researchers cited both the multi-dimensional nature of vocabulary knowledge and the negative outcomes lack of this kind of knowledge can have on the reading outcomes of ELs. The intervention focused on Tier Two vocabulary words and taught students both direct instruction in vocabulary and word learning strategies. Teachers in the study met on a monthly basis to discuss the intervention and its progress. The researchers found significant effects on meaning of taught words ($d = 0.39$), morphological awareness ($d =.20$), and word meanings in expository text ($d = 0.20$). However, no effects were found on norm-referenced vocabulary post-test results. Students with lower initial knowledge benefited more from the study than those with higher initial knowledge. Lesaux, et al. purported that these findings suggested that "text-based academic vocabulary teaching is a promising approach for improving early adolescent vocabulary and comprehension" (p. 220).

O'Hara and Pritchard (2008) also noted the need for academic vocabulary intervention for ELs. The study focused on sixth and seventh grade ELs whose native language was Spanish ($n = 40$). The study compared traditional vocabulary instruction to instruction that included technology for sixth grade Social Studies content and seventh grade Science content. The study focused on teaching ELs to define vocabulary words in presentations created by the students through graphics and hypermedia. The study focused on Tier Three content-specific vocabulary words. Researchers stated that

students in the treatment group showed greater gains in vocabulary knowledge than those in the control group.

Proctor, Dalton, and Grisham's (2007) intervention focused on EL students and struggling readers. Thirty 4th grade students participated in the four-week study, that focused on a digital approach to learning to read called a Universal Literary Environment (ULE). The intervention included strategy instruction as well as vocabulary instruction using hypertext. Each session started with students focusing on five power words, which students taped themselves pronouncing and then wrote down. To support comprehension while reading, students were prompted with strategy instruction and hints embedded in the text. Students demonstrated no vocabulary gains from pretest to posttest ($F < 1$). Comprehension gains demonstrated a similar pattern, $F (1, 28) = 1.29$, $p = .27$. Analysis detected a significant difference between ELs and native English speaking peers. The researchers analyzed the number of interactions students were having with the text and qualitatively concluded from student surveys that participants who utilized the hyperlinks were engaging in a meaningful way with the text.

Rivera, Wood, and Spooner (2012) examined the effects of Spanish and English vocabulary instruction for English Language Learners with moderate intellectual disability. The students in the study ($n = 3$) were Spanish speaking students. Rivera, Wood, and Spooner utilized an alternating treatments design. Two of the students demonstrated greater growth in the number of English words acquired in the Spanish model-lead intervention. For the third student, vocabulary scores increased during both treatments, with no advantage to instruction appearing for either language.

Short, Fidelman, and Louguit (2012) implemented Sheltered Instruction Observation Protocol (or SIOP) for two years for 6th through 12th graders of various language backgrounds. The study was quasi-experimental, comparing two districts in New Jersey. The SIOP model of instruction (Echevarria, Vogt, & Short, 2013) combines strategies such as making learning and content goals visible to students and providing multiple opportunities for students to interact with each other and with academic vocabulary. The students in the treatment groups demonstrated greater growth on measures of Writing, Oral Language, and Total English scores on the IDEA Language Proficiency Tests.

Taboada and Rutherford (2011) attempted to "tackle the dual responsibility of teaching…children not only conversational English but the content knowledge necessary for academic English" (p. 113). The Taboada and Rutherford experiment compared Contextual Vocabulary Instruction (CVI) to Intensified Vocabulary Instruction (IVI). The study examined the effects of both treatments for fourth graders. Those receiving the CVI intervention received instruction in building background knowledge, student questioning, graphic organizers, and comprehension. Those receiving the IVI intervention received explicit vocabulary instruction, multiple exposures to vocabulary, and were taught words in generative ways. The daily intervention lasted for eight weeks with instruction occurring 35 minutes per day. A total of 104 Tier Three words were taught. Because of the small sample size ($n = 20$), only descriptive statistics were provided. Students in the CVI treatment group made larger gains in reading comprehension and inference. Students in the IVI group made larger gains in vocabulary instruction. The

researchers concluded that ELs benefitted the most in academic vocabulary when the words were explicitly taught.

Townsend and Collins (2009) attempted to determine if evidence-based strategies for general vocabulary instruction were also effective for middle school ELs. The study focused on Tier Two words for the intervention. Fifty-two sixth through eighth grade students participated in the intervention that focused on the rich vocabulary instruction of Beck where instructors attempt to build depth of student vocabulary knowledge, allow multiple exposures to words in multiple contexts, and provide word games to expose students to nuance in word meaning. Students were subjected to a control and a treatment period. The researchers found that students' growth during the control period negatively predicted their growth during the intervention. Therefore, the intervention had the greatest effects for participants who made the fewest gains when the intervention was not occurring. Age also correlated negatively with development. Native language showed no correlation to development; however, the researchers also purported that initial English proficiency was a determining factor in growth during the intervention.

Vaughn, Martinez, Reutebuch, Carlson, Thompson, and Francis (2010) incorporated video segments into their academic vocabulary instruction to seventh grade Social Studies students. Participants were seventh grade students in one of two experimental groups ($n = 381$ and $n = 507$), who met for 12 weeks, 5 times per week, for 50 minutes a time. Students in the treatment group received multicomponent social studies instruction, explicit vocabulary instruction, peer-pairing, video segments, and graphic organizers. Students in the treatment group outperformed students in the control

group in both vocabulary, t (13) = 4.026, p = .002 and comprehension, t (13) = 14.31, p

≤ .001.

Strengths of Previous Studies

The collective strengths of these fourteen primary studies are as follows:

(1) a focus on the needs of ELs in the area of vocabulary

(2) a focus on academic vocabulary (either Tier Two or Tier Three Words)

(3) a focus on multi-dimensional, robust instruction with multiple exposures to

various dimensions of vocabulary

The first strength is the collective focus of these studies on improving the

vocabulary knowledge of students who are ELs. All studies of the fifteen primary studies

(see Table 1) focused on the needs of ELs in the area of vocabulary.

An additional strength of the existing primary studies includes the collective focus

on robust instruction and multi-dimensional approaches to teaching academic vocabulary

to ELs. The intervention in the Carlo, et al. (2004) exposed ELs to word association

tasks, synonym and antonym tasks, as well as semantic feature analysis. In an attempt to

gain greater knowledge of the words themselves, these tasks allow for EL students to

have multiple exposures to words and analyze those words on a variety of levels. The

SIOP model of instruction provided to treatment students in the Short, et al. (2012)

focused on multiple interactions with students and with vocabulary in content classrooms.

Townsend and Collins (2009) found the importance of multiple, in-depth exposures to

vocabulary, especially when instructing EL students. Denton, et al. (2008) investigated

the effects of a multi-dimensional reading intervention, focusing on vocabulary, fluency,

and comprehension for sixth through eighth grade students who were simultaneously EL and identified with learning disabilities.

Linking their work to Beck's robust instructional strategies and emphasizing the importance of direct and explicit vocabulary instruction, Lara-Alecio et al. (2013) also provided multi-dimensional vocabulary instruction in addition to a wide range of services provided to those in their treatment group. Lee and Muncie (2006) also focused on explicit vocabulary instruction in attempts to improve students' productive vocabularies in writing assessments, and Lara-Alecio, et al. (2012) focused on direct and explicit vocabulary instruction imbedded in their inquiry-based learning intervention to support EL's science and reading achievement. August, et al. (2009) designed an intervention for ELs to learn both science content and vocabulary through a multi-dimensional approach.

Limitations of Previous Studies

There are three collective limitations of these primary studies. The first of these limitations is the feasibility of intervention being possible in the average classroom. Many of these studies require additional resources, additional time and extensive knowledge of literacy for content-area teachers. The second of the three limitations is a need for focus exclusively on Tier Two vocabulary. The final of the three limitations is the lack of acknowledgement of student attitudes and values regarding language use potentially affecting quantitative results.

In order for interventions to be successful at the classroom level, researchers need to consider the feasibility of the implementation of said intervention. Three possible hindrances to content-area teachers who may want to implement the strategies used in the

eleven primary studies include the necessity for additional resources, the duration of the intervention, and the additional knowledge base of literacy skills required by the interventions.

A lack of adequate resources for effective implementation of strategies is a common complaint of many classroom teachers, and yet, many of these interventions require extensive additional resources, which would be unavailable to many content-area teachers. In their intervention, Lara-Alecio, et al. (2013) provided students with certified teachers, bilingual paraprofessionals, and enhanced curriculum. Townsend and Collins (2009) used an afterschool intervention to administer LanguageWorkshop to EL students providing depth and breadth of academic vocabulary through multiple exposures to words, shared readings, games, and read alouds. On a smaller scale, many of the interventions required additional technology to be available to students.

The three studies conducted by Lara-Alecio, et al. (2013), O'Hara and Pritchard (2008), and Proctor, et al. (2007) also required additional resources. All three sets of researchers examined ways in which technology assisted vocabulary growth in EL students, and they all found some positive effects. Lara-Alecio, et al. (2013) added to technology as part of a comprehensive intervention. O'Hara and Pritchard (2008) compared traditional science or social studies curriculum to projects which incorporated hypermedia. Proctor, et al. demonstrated the benefits of hyperlinks embedding definitions for student vocabulary knowledge. The researchers designed an entire program surrounding the texts and the hyperlinks to glossary words, so the intervention would not be possible without that particular computer program.

Likewise, Vaughn, et al. (2010) incorporated video segments into their academic vocabulary instruction to seventh grade Social Studies students. These studies all resulted in gains in vocabulary for EL students, but all of the studies also require those students to have consistent access to technology for the duration of the intervention.

The duration of the intervention is the second limitation to these strategies being implemented in content-area classroom. The intervention in the Carlo, et al. (2004) instruction lasted for 15 weeks, with groups meeting four times a week for 30-45 minutes a session. The Denton, et al. (2008) intervention lasted 13 weeks, 5 times per week for 30 minutes a session. Lesaux, et al.'s (2010) study lasted for 18 weeks with students meeting 4 times per week for 45 minutes a day. The Short, et al. (2012) study lasted for two years. The Taboada and Rutherford (2011) lasted for eight weeks with no information provided as to how many times students met or how long those meetings lasted. The interventionists in the Townsend and Collins (2009) met with students for 5 weeks, 5 times per week, for 75 minutes a day. Finally, Vaughn, et al.'s (2010) intervention lasted for 9-12 weeks, 5 times per week, for 50 minutes a day. If content-area teachers are on a traditional schedule where students come to their classes for 55-minutes a day, these researchers have designed vocabulary strategies which are as long, or longer, than the entire class period. Content-area teachers need effective strategies that can be more easily incorporated into their current classroom environments.

When dealing with creating instructional strategies to be implemented in the content-area classroom, researchers also need to consider the additional knowledge of literacy strategies necessary for content-area teachers to implement the strategies. The Denton, et al. (2008) intervention required ten hours of professional development for the

teachers in the study. Lara-Alecio, et al. (2013) required paraprofessionals in the study to attend monthly professional development session that lasted for three hours each. Likewise, teachers in the Lesaux, et al. (2010) intervention had an out of classroom time obligation as they were required to meet monthly to discuss the intervention. The SIOP model used in the two-year Short, et al. (2012) study was a district-wide initiative that required extensive training of teachers who implemented the study.

The next limitation of these primary studies is a lack of consistent focus on Tier Two academic vocabulary. As Carlo et al. (2004) reported, with so many potential words to focus on during instruction, students would receive the most benefit in comprehension across content areas from intervention in the general academic terms, or Tier Two academic vocabulary. Vaughn, et al. (2010), Silverman and Hines (2009), Townsend and Collins (2009) Carlo, et al. (2004) focused on Tier Two words for their vocabulary intervention. However, the students in the Lara-Alecio, et al. (2013), Taboada and Rutherford (2011) and the O'Hara and Pritchard (2009) studies were taught Tier Three words, which would be specific to only the science classroom. Rivera, et al. (2012) focused on Tier One vocabulary words during their comparative study.

The final limitation of these primary studies is the lack of focus on student demographics, attitudes, and values regarding English language acquisition. These findings of these studies could have been enhanced with a qualitative component that investigated students through a qualitative interview that addressed these factors that students bring to the classroom, beyond simple ability levels.

CHAPTER III

Methodology

This study focused on the effects of Tier Two vocabulary squares intervention on the academic vocabulary knowledge and the comprehension of middle school EL students. The study compared the vocabulary squares intervention to a definitional intervention in the same Tier Two vocabulary words.

This chapter affords information on the methodology of the study including the participants of the intervention and the setting. This chapter also provides a description of the vocabulary squares intervention and the researcher-created pre-assessments and post-assessments.

Participants

Setting. The district where this intervention took place is a large urban district in Tennessee. The school where this intervention took place currently has 75.4% of its population receiving free and reduced lunch. Therefore, the school receives Title I funding.

At the end of 2012, the student body of the school was comprised of 8.9 % Asian students, 29.5 % African American students, 15.9 % Hispanic students, and 45.6 % Caucasian students. In the year 2008-2009 the student body contained a 2 % EL population. As a result of another school closing and students being reassigned, the EL population grew from 2 % to 11.4 % in 2009-2010.

Middle School Students. Students in the study were eighth graders who had tested out, or opted out, of ESL services and therefore were enrolled in the school's standard eighth grade Literacy class instead of receiving pull out ESL services during the

usual Language Arts and Reading classes. Students in the study with an age range of 12 to 14 years old.

The ethnicity of the 24 students involved in the study varied and was determined by a pre-intervention survey of students that included the country of origin of the student's father or mother and the language(s) spoken at home. The survey (see Appendix D) also included the information on student native language, how long students have been in America, how long the students have been in an academic setting, and what type and the duration of EL services the students have received. In addition the survey asked students their gender, ethnicity, IEP status, and whether or not the student is literate in their native language.

Table 2

Demographic Characteristics of Participants

Characteristic	*n*	%
Gender		
M	6	25
F	18	75
L1		
Spanish	9	37.5
Arabic	4	16.67
Vietnamese	6	25.00
Portuguese	1	4.17
Somali	1	4.17
Gujarati	3	12.5
Literate in L1	8	33.33
IEP	0	0

Table 2 provides descriptive statistics based on the students' responses to the pre-intervention survey. All of the participants ($n = 24$) reported being in EL classes previously in their academic career, but none of the students in the study were currently enrolled in ESL services.

This was a convenience sample of students as the researcher used students in her own school, though students were randomly assigned to treatment ($n = 12$) and control ($n = 12$) within each class. The researcher/teacher polled her students to see who qualified for the study. The students who responded ($n = 26$) received consent forms to be signed by the student's parent or guardian (see Appendix O). Once parental permission was received, the students signed their own consent to participate, and the students were informed of the structure of the study, their time obligation, and their ability to withdraw at any time should they wish to no longer continue with the study.

After permission was obtained from both parents and students, the students were randomly assigned to treatment or control group in order to control for pre-intervention differences in ability level (Gall, Gall, & Borg, 2007). The treatment and control groups met as small groups with the teacher while students not participating, or not eligible to participate, in the study worked independently or with student-led small groups on a project-based learning project around the classroom.

Each group lost one member due to being absent on the last day of post-testing, leaving the treatment group with 12 members and the control group with 12 members. Therefore, rate of attrition was 7.69 % for the treatment group and 7.69 % for the control group.

Design

The study was an experimental, pre-posttest control group design. Students in three 8th grade Literacy classrooms were randomly assigned to form a treatment and a control group. Using a pretest-posttest control-group design allowed the researcher to attribute posttest change in the treatment group, beyond that of the control group change, to the intervention (Gall, et al., 2007). The pre-posttest control group design controlled for history, maturation, testing, and instrumentation effects on students. History effects are the possibility that another event could affect outcomes. Maturation effects are the abilities of students to progress during the experiment. The effect of testing is the ability of the students to become better adept at taking a particular assessment from pre-test to post-test, and instrumentation effects result from a learning gain being observed because the instrument measuring it has changed (Gall, et al., 2007).

The pre-posttest control group design allowed the researcher to check for pre-test differences that may be an issue when randomizing small samples within each class. This design also allows for differences measured in the post-tests to be attributable to the intervention rather than preexisting ability levels or attributes of the students.

The target population to which this study can be generalized will be eighth grade EL students in an academic classroom, particularly science. With the pre-posttest design, external validity could have been affected through pretest sensitization because students received the exact same ETTVA pretest and posttest, and the ETTVA tests the same 30 Tier Two academic vocabulary words in which the students received intervention.

Initial oral vocabulary ability of the students was determined by obtaining students' Peabody Picture Vocabulary Test.

Materials

  Measures

   Peabody Picture Vocabulary Test IV, PPVT-IV. The PPVT-IV is an individually

administered test of oral language vocabulary. During the assessment of the PPVT-IV,

the assessor reads a word out loud to the student. The student must then select the correct

illustration that represents the word provided out of four illustrations given.

   The PPVT reports a split-half reliability of .94 for the assessment and an average

validity of .74 with the OWLS Oral Expression Scale. Similar to the PPVT, the OWLS

Oral Expression Scale is an oral assessment that requires students to respond to visual

and oral stimuli by replying to questions, completing sentences, and creating sentences on

their own. The PPVT-IV was administered to all students in the study to measure

students' oral vocabulary knowledge. The PPVT-IV is not normed for EL students;

however, the PPVT-IV was chosen because the assessment provides an estimation of a

student's oral English vocabulary level without that student being impeded by a student's

ability to read or write in English.

   English Learner Tier Two Vocabulary Assessment (ETTVA). The students were

assessed, before and after the intervention, with the researcher-created English Tier Two

Vocabulary Assessment (ETTVA). This assessment (see Appendix B) has students rank

their knowledge of a word on a scale of one to five. A score of one indicates the student

has never heard of the word while a score of five states the student can use the word

accurately in a sentence (see Appendix C for scoring rubric).

This rating system used by the ETTVA allows for a more subtle differentiation of individual student vocabulary knowledge than simply identifying a vocabulary word in an illustration or simply providing the definition. Students were assessed as a whole group for pretest and posttest on the ETTVA. Students were assessed on all 30 Tier Two academic vocabulary for both the pre-test and the post-test.

Comprehension Measure. The students were also assessed, before and after the intervention, using a group administered, researcher-designed, comprehension measure. The pre-test and post-test both consisted of a single passage from the students' 8th grade science textbook (see Appendix F). The students were asked to read the passage silently. The students were instructed to then turn the page over and respond the 10 comprehension questions without looking back at the passage (see Appendix K for pretest questions and Appendix L for posttest questions).

The first of the 10 questions on the passages each began by asking the student what the passage was about. Then, students were asked literal, recall questions, moving into inferential questions, and ending on a vocabulary question. Student comprehension levels were determined through a researcher-created comprehension assessment. Prior to the comprehension assessment, the students were asked a question to determine prior knowledge of subject matter. The students then read a passage silently. Finally, the students silently answered comprehension questions based on the passage without returning to the text.

Passages were from eighth grade Science textbooks (Daniel, Rillero, Biggs, Feather, & Zike, 2010). Because these texts were the source of the Tier Two academic vocabulary words, these passages included the vocabulary taught during the intervention.

Passages were selected from a unit the students have not already covered. Therefore, students will not have seen the passages before the intervention begins. Comprehension questions were open ended. Each set of comprehension questions included seven recall questions, two inference questions, and one Tier Two Vocabulary question. Comprehension questions were analyzed by the literacy specialist to determine if the questions are recall or inference.

Post-Intervention Affective Survey. At the end of the intervention, all students in both the treatment and control groups were given a short survey (see Appendix M). Survey questions asked students to rate their experience in the intervention on a scale of 1 to 10. The students were also asked what their most favorite and least favorite components of the study were and whether or not they would participate in a study such as this again. Results of this survey would allow researchers to understand the feelings of students as they participated in the intervention and to potentially modify the intervention based on student suggestions.

Interview. At the intervention's conclusion, student results were tabulated for all five assessments. The student with the highest average, the student with the lowest average, and one student with a median average were interviewed on their attitudes and values regarding their native language use and their English acquisition to determine if any similarities and differences could be found among student outcomes and the daily language use of students. These interviews were recorded, transcribed, and evaluated.

Curriculum

The 10-15-minute intervention period focused on Tier Two academic vocabulary words in conjunction with EL-specific vocabulary squares (see Appendix E). Similar to

the August, et al. (2009) study, students were introduced to Tier Two academic

vocabulary through short, authentic, science text excerpts pulled from their eighth grade

science textbooks (see Appendix F). Barr, Eslami, and Joshi (2012) offered vocabulary

instruction strategies for content-area instruction specific to EL students. Their

recommended strategies were utilized in conjunction with scaffolded content-area

vocabulary lists (see Appendix G).

The strategies are as follows:

(1) Link new vocabulary with background knowledge by having students

brainstorm what they already know about the topic (Burke, 2004)

(2) Utilize semantic mapping to demonstrate the semantic relationships of known

and unknown terms (Bos & Anders, 1990; Baker, et al., 1998)

(3) Restate dictionary definitions of new words in their own words and make up

sentences using the new words (Beck, et al., 2013)

(4) Explore synonyms and antonyms to increase understanding of academic

vocabulary (Beck, et al., 1983)

(5) Analyze the structure of new words (affixes, inflections, compound words,

and contractions) to determine their meanings (Nagy & Anderson, 1984)

(6) Use contextual analysis activities that require students to use semantic and

syntactic features of sentences to determine the meanings of new words (Nagy,

Herman, & Anderson, 1985, Anderson & Nagy, 1991)

(7) Maintain personal content-related word lists or word banks (Beck, et al., 2013)

(8) Work cooperatively to figure out meanings of new words (Barr, et al., 2012)

The vocabulary squares encompass strategy 1-6. To accomplish strategy 7, EL students maintained a vocabulary notebook with all of the vocabulary squares and a word bank in the front to document newly learned words. Strategy 8 was addressed as students began each session by reviewing the previous sessions' words before creating vocabulary squares with the new day's words (see Appendix H). Two words were taught per day, and 30 words were taught overall. The words were selected from the science textbook and were confirmed through the Academic Word List (Coxhead, 1998).

Students in the control group met with the interventionist to define the vocabulary words and read the science passages after the intervention group met to complete the vocabulary squares and read the science passages. All sessions were audio recorded, and 25% of those recordings were assessed with a fidelity checklist (see Appendix I) by doctoral students. Inter-rater reliability was calculated for the ETTVA and the researcher-designed comprehension pretest and posttest that utilized passages from the students' science textbooks (Daniel, et al., 2010).

Procedures

Testing Procedures. All students were tested by the researcher during their Literacy or their Related Arts classes in early November. Students were assessed individually during the pretest for the PPVT-IV. Students were assessed in small groups for the ETTVA and the Comprehension measure. After the intervention, students were assessed on the ETTVA, comprehension measure, and the social validity survey. Because it was the final day of classes for the semester, all of the students in both the treatment and the control groups met in the researcher's classroom to be post-assessed simultaneously.

*Intervention Procedures***.** Students in both the treatment and control groups met with the researcher daily for the duration of the study. The students were on block scheduling and have three blocks per day. Therefore, the researcher created both a treatment and a control group for each block, making a total of six small group sessions a day. Students met with the researcher for 10-15 minutes a day and received Tier Two vocabulary instruction using either vocabulary squares intervention or the comparison, definitional intervention.

Interview Procedures. All interviews were done orally between the researcher and the student. The interviews were recorded, and transcriptions were created from those recordings (see Appendix P). These transcriptions were evaluated for patterns in students' attitudes and values regarding English language acquisition.

*Treatment fidelity***.** All treatment and control sessions were audio recorded using an iPhone IV. Twenty-five percent of those recordings were analyzed by fellow doctoral students using the treatment fidelity checklist (see Appendix I) to ensure that the treatment sessions followed the proper procedures and included the appropriate steps of the vocabulary squares intervention. Control sessions were also recorded and analyzed according to the control fidelity checklist (see Appendix J) to ensure the students in the group received the appropriate instruction. Fidelity for the intervention groups was .98 for the treatment sessions and 1.00 for the control sessions.

Reliability. Twenty-five percent of the ETTVAs and the comprehension measures were rescored by research assistants. Inter-rater reliability was .92 for the ETTVA and .95 for the comprehension measure.

Data Analysis

There were four original research questions investigated during the study. From the three quantitative research questions, eight hypotheses were proposed to determine the effectiveness of Tier Two vocabulary squares intervention on supporting growth in both vocabulary and comprehension for EL students. The scores on the pre-assessments and post-assessments were statistically analyzed in order to determine the effectiveness of the vocabulary squares intervention and how its effectiveness compared to the definitional control. The research questions and eight hypotheses were analyzed in the following manner:

(1) Will the use of vocabulary squares intervention increase the academic vocabulary knowledge of 8th grade students who are EL?

   (a) There will be a significant group effect between the vocabulary squares intervention group and the definitional control group on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

   (b) There will be a significant pretest and posttest effect on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

   (c) There will be a significant interaction effect between groups and tests on Tier Two academic vocabulary knowledge for eighth grade students who are EL.

   2(B) X 2 (W) Mixed Design ANOVA

(2) Will the use of vocabulary squares intervention focused on Tier Two academic vocabulary increase the comprehension of science texts for 8th grade students who are EL?

(a) There will be a significant group effect between the vocabulary squares intervention group and the definitional control group on comprehension for eighth grade students who are ELs.

(b) There will be a significant pretest and posttest effect on comprehension for eighth grade students who are ELs.

(c) There will be a significant interaction effect t between groups and test on comprehension for eighth grade students who are EL.

2(B) X 2 (W) Mixed Design ANOVA

(3)   If the intervention is effective, will the effects differ based on a student's PPVT-IV?

(a) There will be significant differences between the vocabulary squares intervention group and definitional control on Tier Two academic vocabulary posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

ANCOVA

(b) There will be significant differences between the vocabulary squares intervention group and definitional control on comprehension posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

ANCOVA

The content validity for the ETTVA was considered by determining whether or the ETTVA covers Tier Two vocabulary. This was conducted by the Literacy Specialist at the school where the intervention took place, and the Literacy Specialist approved the

Tier Two vocabulary list as consisting of Tier Two academic vocabulary words that could span content-areas.

Likewise, science content validity was assessed by the eighth grade science teacher in the school. The science teacher also confirmed that students in the eighth grade had not yet covered the chapters from which the comprehension passages and the Tier Two academic vocabulary words were pulled. This confirmation ensured that students had not already been exposed to instruction in the topics covered by the science passages. Therefore, students should not have background knowledge in the content covered in the passages.

CHAPTER IV

Results

This study examined the effects of vocabulary squares intervention using Tier Two academic vocabulary words on vocabulary knowledge and comprehension for ELs, and this study compared the effects of the vocabulary squares intervention to the effects of a definitional control on vocabulary knowledge and comprehension. Three quantitative research questions were established to investigate the effects of this intervention, and based on the statistical analysis eight hypotheses were created to analyze the outcomes of the study. After providing an overview of descriptive statistics of participants in the study, the three results of each research question will be addressed individually. Scores from the PPVT-IV were raw scores as raw scores are more sensitive (McCandliss, Beck, Sandack & Perfetti, 2003). An additional fourth qualitative research question was created to evaluate student attitudes and values regarding English language acquisition.

The treatment and control groups were assessed for pretest differences on the researcher-created ETTVA and on the researcher-created comprehension assessments. A one-way ANOVA revealed no significant difference between the treatment and control groups at the time of pre-assessment or the ETTVA F (1,22) = 69, p = .42.A one-way ANOVA revealed no significant difference for the treatment and control groups on the researcher-designed comprehension measure, F (1,22) = 1.21, p = .28. Pre and posttest means and standard deviations are reported in Table 3. A familywise alpha of .05 was used with the Bonferroni method to determine significance for all of the statistical analyses in order to control the error rate.

Table 3

Pre and Post Test Means and Standard Deviations for ETTVA and Comprehension Assessments

	TX		Control	
	M	*SD*	*M*	*SD*
Pretest				
PPVT	160.25	22.40	159.25	18.84
ETTVA	98.25	24.61	91.25	15.65
Comp	40	24.4	48.75	12.81
Posttest				
ETTVA	128.17	18.13	101.33	15.6
Comp	56.67	18.51	54.17	20.54

* n=12 for both groups


Vocabulary Knowledge

The first three hypotheses posed in this study considered whether or not the vocabulary squares treatment would be more effective than the definitional control treatment at increasing the Tier Two vocabulary knowledge of students who are ELs. The hypotheses for vocabulary knowledge were:

(1) Will the use of vocabulary squares intervention increase the academic vocabulary knowledge of 8th grade students who are EL?

    (a) There will be a significant group effect between the vocabulary squares intervention group and the definitional control group on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

    (b) There will be a significant pretest and posttest effect on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

    (c) There will be a significant interaction effect between groups and tests on Tier Two academic vocabulary knowledge for eighth grade students who are EL.

Both the treatment and control groups were pre-assessed and post-assessed using the ETTVA. Scores from this assessment were analyzed using a 2 (B) X 2 (W) ANOVA. For Vocabulary hypothesis (a), results of the 2 (B)X 2 (W) ANOVA revealed that students in the vocabulary squares intervention made gains on Tier Two academic vocabulary at a statistically significantly higher rate than those in the definitional control group: F (1, 22) = 5.701, p = .03, *Wilks' λ* = .67. For Vocabulary hypothesis (b), the 2 (B) X 2 (W) ANOVA revealed a significant difference between pretest and posttest, F (1, 22) = 44.075, p < .000, *Wilks' λ* = .33. Finally, the 2 (B) X 2 (W) ANOVA revealed a

significant interaction effect, $F (1, 22) = 10.84$, $p = .003$, *Wilks' λ* $= .67$. An effect size

was also calculated for the ETTVA posttest, $d = 1.59$. Figure 1 graphs the vocabulary

growth of students in the intervention group versus the control group. Table 4, which

gives the percentages of students responding to each item on the ETTVA, provides a

more nuanced evaluation of student growth in Tier Two academic vocabulary.
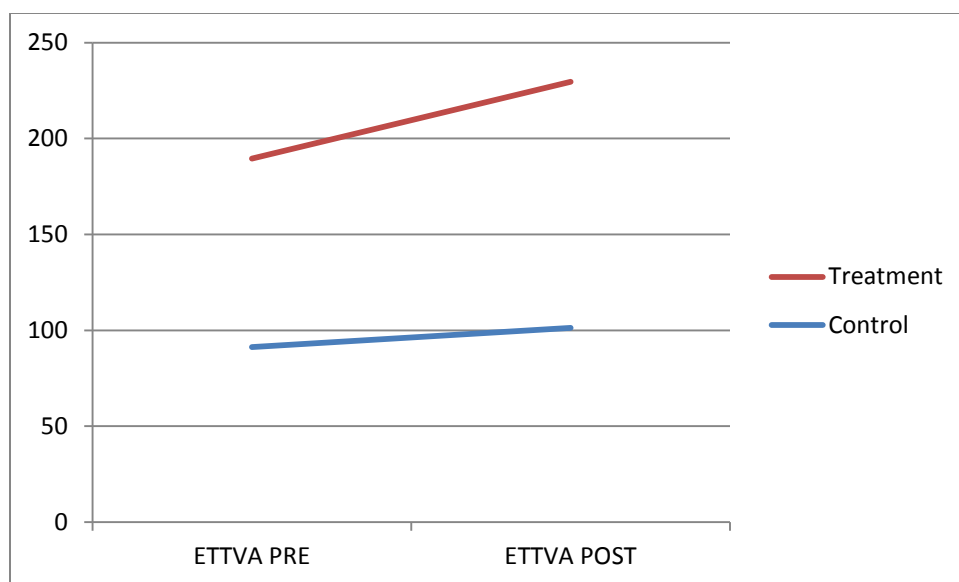
Figure 1. Student Growth on ETTVA

Table 4

ETTVA Item Response Percentages

	1	2	3	4	5
Prettest	2.92%	30.83%	23.47%	7.50%	28.75%
Posttest	0.00%	23.91%	16.80%	5.69%	52.64%

* *Remaining percentage attributed to no response by students*

Comprehension

The next three hypotheses addressed during this research study asked whether or not the vocabulary squares treatment had a greater effect on comprehension than the definitional instruction in the same words. The hypotheses for comprehension were:

(2)　Will the use of vocabulary squares intervention focused on Tier Two academic vocabulary increase the comprehension of science texts for 8th grade students who are EL?

> (a) There will be a significant group effect between the vocabulary squares intervention group and the definitional control group on comprehension for eighth grade students who are ELs.
>
> (b) There will be a significant pretest and posttest effect on comprehension for eighth grade students who are ELs.
>
> (c) There will be a significant interaction effect t between groups and test on comprehension for eighth grade students who are EL

Both the treatment and control groups were pre-assessed and post-assessed using the ETTVA and the researcher-created comprehension measure. Scores for these assessments were analyzed using a 2 (B) X 2 (W) ANOVA to address the three Comprehension hypotheses. For comprehension hypothesis (a), results of the 2 (B) X 2 (W) ANOVA revealed that there was no group effect on comprehension: F (1, 22) = .208, p = .652, *observed power* = .072. For Comprehension hypothesis (b), the 2 (B) X 2 (W) ANOVA revealed a significant difference between pretest and posttest, F (1, 22) = 7.324, p = .013, *Wilks'* λ = .750. Finally, the 2 (B) X 2 (W) ANOVA revealed no significant

interaction effect, F (1, 22) = .920, p = .182, *Wilks'* λ = .920. An effect size was also

calculated for the comprehension posttest, d = 0.13. Figure 2 graphs the comprehension

growth of students in the intervention group versus the control group.
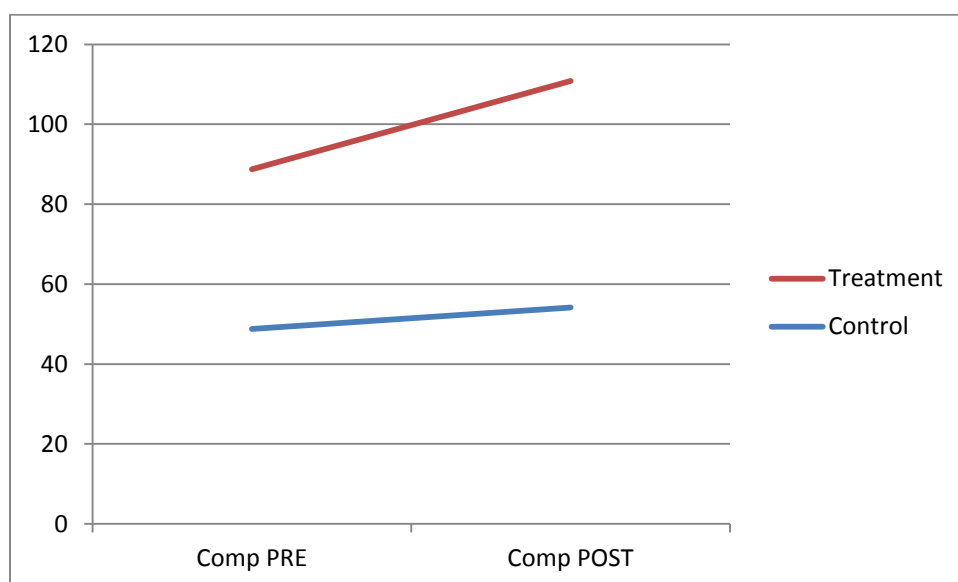
Figure 2. Student Growth on Comprehension
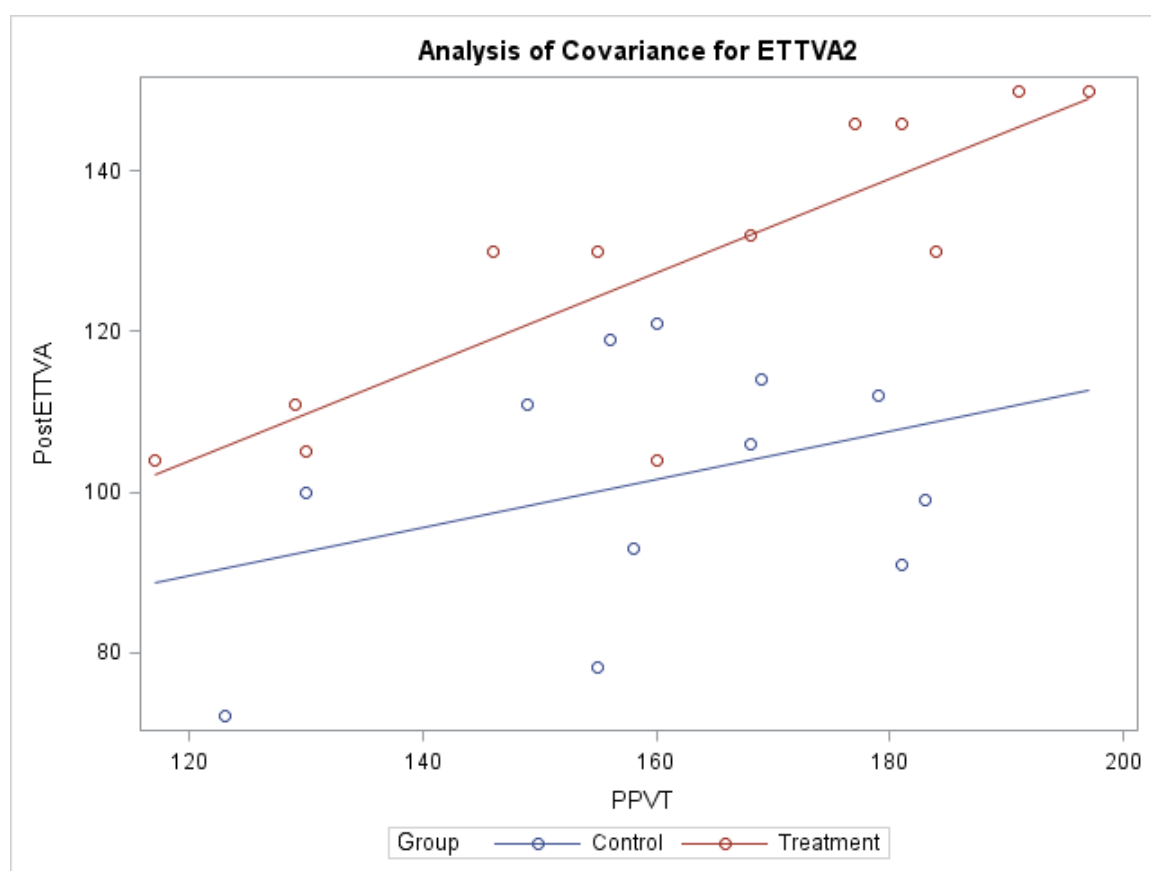
Effects of initial vocabulary ability

The final two hypotheses addressed whether or not the level of receptive vocabulary knowledge students possessed at the onset of the intervention affected their gains in Tier Two academic vocabulary and comprehension. The final hypotheses were:

(3)   If the intervention is effective, will the effects differ based on a student's initial PPVT-IV score?

> (a) There will be significant differences between the vocabulary squares intervention group and definitional control on Tier Two academic vocabulary posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

> (b) There will be significant differences between the vocabulary squares intervention group and definitional control on comprehension posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

Both the treatment and the control group were pre-assessed using the PPVT-IV to determine initial receptive vocabulary knowledge. Both the treatment and control groups were post-assessed using the researcher-created ETTVA, an assessment of Tier Two academic vocabulary. Both the treatment and control groups were post-assessed using the researcher-created comprehension measure. An ANCOVA was run on the final ETTVA scores, and an ANCOVA was run on the researcher-created comprehension measure. The PPVT-IV was used as the covariate in both scenarios.

For hypothesis (a) on Effects of Initial Vocabulary Knowledge, the ANCOVA analysis showed a non-significant group difference on vocabulary after accounting for the PPVT-IV, $F (1,20) = 1.30$, $p = .27$. Figure 3 illustrates the results for the Effects of Initial Vocabulary Knowledge on the ETTVA.

For hypothesis (b) on Effects of Initial Vocabulary Knowledge, the ANCOVA analysis showed no significant difference on comprehension after accounting for the PPVT-IV, $F (1, 20) = .03$, $p = .87$. Figure 4 illustrates the results for the Effects of Initial Vocabulary Knowledge on Comprehension.

Figure 3. Effects of Initial Vocabulary Knowledge on ETTVA
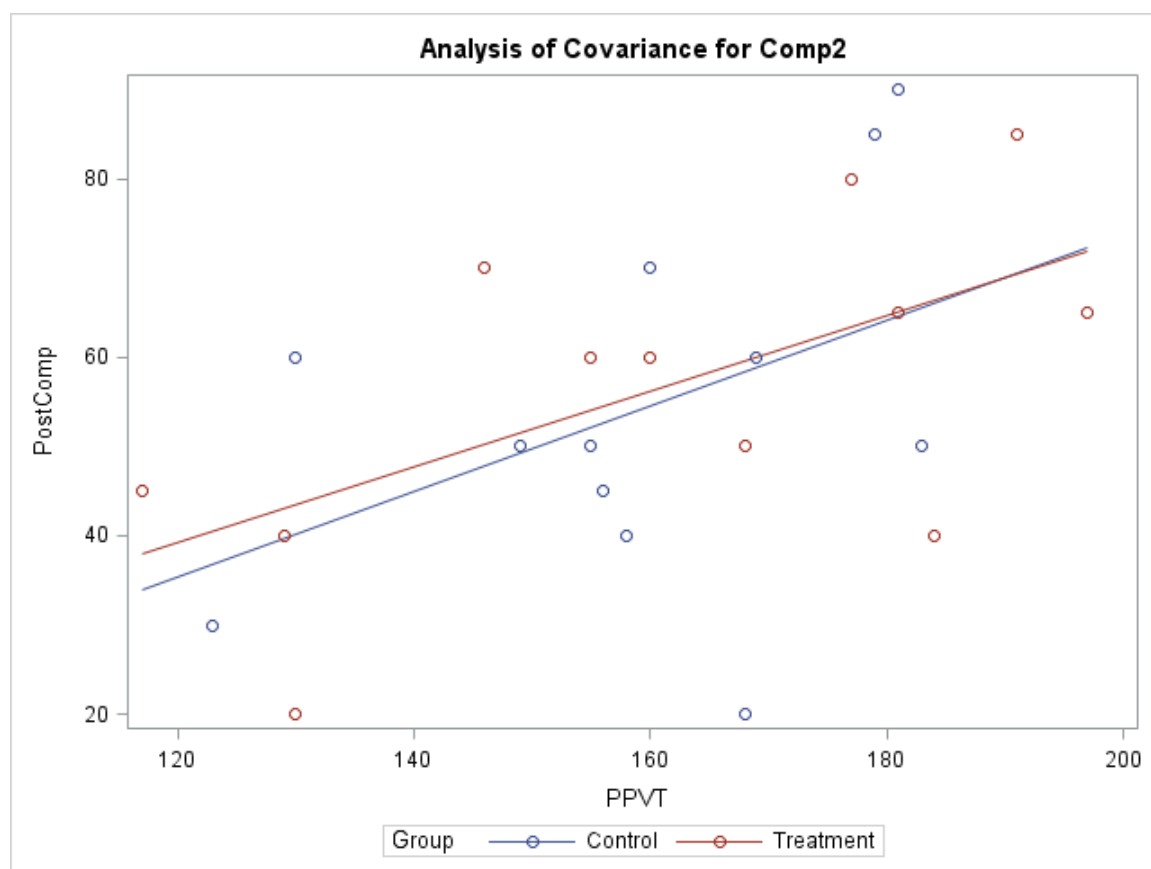
Figure 4. Effects of Initial Vocabulary Knowledge on Comprehension

Post-Intervention Affective Survey

        After students participated in the intervention, they were administered a survey to determine their feelings regarding the intervention. The results from the student responses to the post-intervention survey are listed in Table 5.

Table 5

Post-Intervention Affective Survey
Results

Average Rating (1-10)	7.85			

	T		F	
	n	%	*n*	%
I learned a lot from this study.	24	100	0	0
I enjoyed being a part of this study.	23	95.83	1	4.16
I would participate in a study like this again.	20	83.33	4	16.67

The best part about the study was:*	*n*	%
Candy/Food	15	62.5
Small Groups	3	12.5
Learning	6	25
Getting out of Class	5	20.83
Help	1	4.17
The worst part about the study was:		
Working on PBL at the same time	9	37.5
Makeup Work	9	37.5
Too much writing/vocabulary	2	8.33
None	3	12.5

Some students gave multiple responses.

Interview.

Interviews were administered for the three students who achieved the highest score- Student 1, the median score- Student 2, and the lowest score- Student 3. The interviews were recorded and transcribed. These transcriptions (see Appendix P) were evaluated for similarities and differences among students in attitudes and values regarding language use and English acquisition.

All three students identified themselves as being bilingual. Student 1 and Student 3 both spoke of having learned Spanish in their homes before learning English in the school setting. Student 2 spoke of learning Somali before learning English when she moved to this country.

All three of the students identified times in their lives when they had to serve as a translator between a non-English speaking adult and an American.

B: Have you ever had to translate for your parents?

Student 1:
K: And so we would go visit him, and there was this lady, and she was pregnant, and she couldn't speak English, so I had to translate, really panicked, and I was like six, and I could translate, and I was like she's having a baby. And they were like okay, okay, okay. So does she like feel any pain, and like yeah.

Student 2:
M: I tried to, but and then, and then they just don't get what I'm saying so like to translate it back to English and some words, some big words, I can't say in my language. I know a lot of my language, but I could tell you, I could tell y'all what they say just like translate every word they say, but English when I try to translate to them, like it's hard.

Student 3:

P: Yeah, we were, uh, um, at the doctor, and my mom didn't know how to tell them, so I told them.

B: Oh wow. Did you ever have any trouble with it, or?

P: No.

B: No? You just were easy?

P: Yeah.

B: Wow. That's, that's really good.

All three students regarded learning to speak English as necessary to their futures.

B: How do you feel about learning English? Why?

Student 1:

K: It was a necessary… It was necessary, if I was going to live in the United States and go to school here.

B: So, so I mean, are you happy that's what you're doing? Or?

K: Um, it's good that I know two languages.

Student 2:

M: Um, actually, I feel good, um, because you feel like my mom, and them, they want like me to learn good English so I can go to college and stuff.

B: Okay, so your mom supports you learning English? She really wants you to?

M: (coughs)

B: Okay.

M: She wants me, and when like I get bad grades, she doesn't want. She likes me to do, so like when I grow up she can go back to her country. Like when I grow up, and like, she wants me to take her, her back to Africa.

Student 3:

P: Good because that helps me to get a job better, and they will need me if there's somebody that doesn't know how to speak English I will translate it.

B: How do your parents feel about you learning English? Why?

P: Good because they told me I'll get a good education and stuff like that. Yeah, to get good grades, and they just told me to like talk to them in English or Spanish, it don't matter, just to learn both.

B: Okay, so they want you to learn both?

P: Yes.

B: They think Spanish is important, too?
P: Yeah. For high school, they want me to take Spanish.
B: Oh good, cause you never learned to write in Spanish?
P: Yeah.
B: Okay, okay.

The distinguishing factors between the highest scoring student and the lowest scoring student seemed to be time in the United States and parents who had more advanced English skills. Student 1 was born in the United States and began pre-kindergarten in an American classroom. Student 2 did not begin learning English until she was six years old after arriving in the United States. Student 3 also moved to the United States when she was a young child, though she did attend pre-kindergarten as well. Student 1 spoke of parents who have lived in the United States for the longest time frame, and she described her mother as being an intermediate English speaker, while Student 2 and Student 3 both expressed troubles their parents have had acquiring the language.

CHAPTER V

Discussion

This study was an attempt to increase the Tier Two academic vocabulary knowledge of eighth grade students who are ELs. The researcher also hoped to increase the comprehension levels of eighth grade students who are ELs by providing intervention in Tier Two academic vocabulary. This chapter provides an overview of the results, whether or not the results matched the researcher's initial hypotheses, discusses limitations of the study, and provides recommendations for future research in the area of Tier Two academic vocabulary.

Vocabulary. The first three hypotheses this study attempted to address were:

(1)   Will the use of vocabulary squares intervention increase the academic vocabulary knowledge of 8th grade students who are EL?

   (a)   There will be a significant group effect between the vocabulary squares intervention group and the definitional control group on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

   (b)   There will be a significant pretest and posttest effect on Tier Two academic vocabulary knowledge for eighth grade students who are ELs.

   (c)   There will be a significant interaction effect between groups and tests on Tier Two academic vocabulary knowledge for eighth grade students who are EL.

According to the results, students in the vocabulary squares treatment group

demonstrated more growth on the researcher-created ETTVA than those in the definitional control group. This result confirms the Vocabulary hypothesis (a) that use of vocabulary squares intervention increases academic vocabulary knowledge of eighth grade EL students as compared to definitional instruction. The second Vocabulary hypothesis was also confirmed. There was a significant pretest and posttest effect on Tier Two academic vocabulary knowledge for eighth grade students who are ELs. Finally, the third Vocabulary hypothesis was also confirmed. There was a significant interaction effect between groups and tests on Tier Two academic vocabulary knowledge for eighth grade students who are EL.

The results add to the research confirming Beck's theory of the importance of robust instruction of a word improving students' understandings of that word. This result also adds to the research supporting the importance of multiple exposures to Tier Two academic vocabulary improving the depth and breadth of EL students' overall vocabulary knowledge.

This result demonstrates that robust instruction improves student knowledge of vocabulary better than simple, definitional instruction, which only provides students with one dimension of a word's meaning.

The brevity of the intervention demonstrates that such robust instruction can be accomplished in a 10-15 minute small group setting. This confirms the researcher's hypothesis that providing a Tier Two vocabulary intervention that is possible during the average class time of a content area teacher.

Comprehension. The next three hypotheses were:

(2)   Will the use of vocabulary squares intervention focused on Tier Two academic

vocabulary increase the comprehension of science texts for 8th grade students who

are EL?

(a) There will be a significant group effect between the vocabulary

squares intervention group and the definitional control group on

comprehension for eighth grade students who are ELs.

(b) There will be a significant pretest and posttest effect on

comprehension for eighth grade students who are ELs.

(c) There will be a significant interaction effect t between groups and test

on comprehension for eighth grade students who are EL

According to the results, students in both the vocabulary squares

treatment group and the definitional control group made gains on the researcher-designed

measure of comprehension. This finding does not support the researcher's initial

hypothesis that students in the vocabulary squares intervention would improve in

comprehension compared to those in the definitional control.

This result is consistent with the results from a current meta-analysis of 37 studies

considering the impact of vocabulary on comprehension (Elleman, Lindo, Morphy, &

Compton, 2009). Similarly, in this study, the focus on Tier Two academic vocabulary

improved comprehension regardless of the strategy.

Effects of Initial Vocabulary Knowledge. The final hypotheses in this study attempted to address how the varying initial ability levels of students affected outcomes in both academic vocabulary and comprehension. The third research question and the researcher's hypothesis were as follows:

(3)   If the intervention is effective, will the effects differ based on a student's English language ability?

> (a) There will be significant differences between the vocabulary squares intervention group and definitional control on Tier Two academic vocabulary posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

> (b) There will be significant differences between the vocabulary squares intervention group and definitional control on comprehension posttest scores after accounting for initial PPVT-IV scores for eighth grade students who are EL.

The results from the ANCOVA reveal that prior English oral vocabulary knowledge predicted student's success during the vocabulary squares intervention.   This finding supports the researcher's initial hypothesis.

Post-Intervention Affective Survey. From an affective perspective, students in the study enjoyed participating. A large majority of students (100%) in both the treatment and the control group felt they learned a lot during the study's duration. A majority of students (95.83%) enjoyed being a part of the study, and a majority of students (83.33%) felt they would be willing to participate in a study like this again.

Results of this nature indicate that students were motivated to participate in both the treatment and the control conditions.

Interview. The interview was to investigate whether or not similarities and differences could be found among the high, medium, and low-scoring students regarding daily language use, attitudes, and values. Unlike what McCarthy, Romero-Little, Warhol, and Zepeda (2010) found when investigating Native American students who felt they were losing their culture by assimilating and learning the English language, these three students all expressed positive feelings about learning English. All three students identified themselves as being bilingual, and all three of the students spoke of the importance of learning English for college and for a good future. As demonstrated in Orellana's study of EL students navigating the middle space between the adult world of non-English speakers and English speakers, all of the interviewed students also spoke of serving as translators for non-English speaking adults, but none of the three students expressed dissatisfaction with this role. In fact, the students appeared empowered by the ability to translate for adults, and Student 2 even expressed a desire to improve her translation skills.

The primary distinguishing factors between the highest scoring student and the lowest scoring student seemed not to be attitude or values, but time in the United States and parents who had more advanced English skills. Student 1 was the only student to be born in the United States, and she was also the only one to describe having a mother who is an intermediate speaker of English. Both of these characteristics would have allowed for Student 1 to be exposed to more English during her academic career.

Limitations

The first limitations of this study are small sample size, generalizability and duration of the study. The small sample size limited the statistical analysis and the assumptions that could be drawn from the analysis. Though the vocabulary squares treatment resulted in improvements in both vocabulary and in comprehension, the results could have been more significant if they had occurred in a larger sample. Similarly, the small sample size limits the generalizability of the study. The results from the study can only be said to be applicable to eighth grade students who are ELs and who are studying science content. The three week duration of the study could also limit its effectiveness. While effects were seen for vocabulary over the initial three weeks, the study may not have been long enough for the effects of the vocabulary squares intervention to be seen in comprehension.

The second limitation on this intervention study was the researcher-designed comprehension measure. An analysis of the pre-assessment and post-assessment revealed that the comprehension measures were not highly correlated with one another (see Table 6). This lack of correlation between the two assessments limits the conclusions that can be drawn from the comprehension assessment results.

Table 6

Pretest and Posttest Correlations

	PPVT	ETTVA1	ETTVA2	Comp1	Comp2
PPVT	1	0.609	0.538	0.591	0.519
PPVT		0.002	0.007	0.002	0.01
ETTVA1	0.609	1	0.648	0.183	0.468
ETTVA1	0.002		0.001	0.393	0.021
ETTVA2	0.538	0.648	1	0.208	0.421
ETTVA2	0.007	0.001		0.33	0.04
Comp1	0.591	0.183	0.208	1	0.447
Comp1	0.002	0.393	0.393		0.889
Comp2	0.519	0.468	0.421	0.447	1
Comp2	0.01	0.021	0.04	0.029	

The final limitation on this study was diffusion between students in the intervention group and the control group within the classrooms. This potential for diffusion was minimized by students in both the control group and treatment group receiving small group instruction on the same vocabulary words for the same time period. Students not receiving small group instruction were completing additional partner and literature circle work, so as to not overhear what the other groups were doing. However, because all students were present in the classroom during the intervention, it is still possible that students in the control group were exposed to what was happening in the treatment group.

Future Research

The first suggestions for future research in this area all stem from the limitations of the assessments used in this study. In the future, either a parallel form of the comprehension measure needs to be created, or a standardized comprehension assessment should be used to determine concurrent validity for the researcher-designed comprehension measure. Likewise, this study would benefit from use of standardized vocabulary assessment that is normed for ELs.

Future research could also attempt to implement these vocabulary squares across content areas in order to determine if the Tier Two academic vocabulary squares intervention could be effective in comprehending other academic texts. The intervention could also be expanded across age groups to determine if the intervention is effective for students other than eighth grade ELs.

An additional suggestion for future research lies in the complexity of the eight strategies used through the vocabulary squares. It would be interesting to analyze which portion of the variance of increase of vocabulary knowledge could be explained by each individual strategy. This would enable researchers to determine which strategies most affect the outcome, and perhaps, this analysis of each individual component of the overall strategy would allow researchers to streamline the strategy even further to only the most necessary components.

The next suggestion for future research in this area is the inclusion of native English speakers in both the intervention and the control groups. For instance, Lesaux, Rupp, and Siegel (2007) conducted a five year longitudinal study in which they examined the growth in reading skills of children from diverse linguistic backgrounds. Though significant differences existed between the ELs and the native English speakers in kindergarten, the researchers found that these differences had all but been eradicated by fourth grade. During the course of the study, the students in both the EL category and the native speaker category were exposed to primary grade instruction that focused on phonics and other basic literacy skills. Most of the students in the current study also were in the American school system in the primary grades. Future research on the effects of Tier Two vocabulary instruction would need to include more students who had not been exposed to English literacy instruction in the primary grades to compare the effects of those who had and had not received such instruction.

In the meta-analysis conducted by Elleman, et al. (2009), students benefit from vocabulary instruction of any kind, as long the teacher focuses on word learning. Results from this meta-analysis indicate that students in the present study may have benefitted

equally on comprehension merely from attention to Tier Two vocabulary words. Future research could include an analysis of how much comprehension of the science texts depended on the Tier Two academic words in that text. One would hypothesize that if only subtle knowledge of the vocabulary word is sufficient for comprehension, then it would follow that students in both the vocabulary squares intervention and the definition control would both benefit in comprehension. However, it would be interesting to analyze how comprehension improved if the text were written such that deep understanding of the Tier Two words was necessary for understanding.

The final suggestion for future research involves utilizing the students' first language in the vocabulary squares intervention. Cisco and Padron (2012) conducted a research synthesis that analyzed important issues in EL literacy instruction. The researchers were concerned with students who are EL only interpreting text literally. Through an analysis of the 11 identified studies, Cisco and Padron (2012) developed three themes they believe provide the best framework to support ELs in reading comprehension. The themes are (a) importance of vocabulary knowledge for comprehension, (b) importance of effective teaching strategies, and (c) importance of first language transfer. The current study considered the first two of these themes. Future research in this area could incorporate the first languages of students into the modified vocabulary squares.

Conclusion

In conclusion, this study was able to create a research-based vocabulary intervention for eighth grade students who are EL. This tool could be useful to content

area teachers who are attempting to provide instruction to an ever-evolving student population. This strategy could help provide the scaffolding necessary for students to climb from success in the EL classroom to success in the content area classroom.

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APPENDIX A

Terms

EL: English Learner, a student in an American classroom who is attempting to learn English, recently replaced the terms English Language Learner (ELL) and English as a Second Language (or ESL).

L1: A student's native language, or first language. This can be difficult to define fully as students can learn more than one language from birth. It is generally used to refer to the language the student primarily communicates in other than English.

L2: A student's second language. This can also be difficult to define as a student may speak multiple languages. Though somewhat inaccurate, in the literature, L2 is often synonymous with English.

Tier Two vocabulary words: As defined by Beck, Tier Two vocabulary words are the academic terms that are generalized across content areas (such as the word "analyze").

APPENDIX B

EL Tier II Vocabulary Assessment

Please "√" the option that truly describes your knowledge about each target word. If your choice is 3 or 4, please give a synonym or translation following your "√" .If you "√" 5, please make a sentence with the target word after your "√" in 5, and also "√" 4 and give a synonym or translation after your "√" in 4.

Target Words	1. I don't remember having seen this word before.	2.I have seen this word before but I don't know what it means.	3.I have seen this word before and I think it means _____ (synonym or translation)	4.I know this word. It means _____ (synonym or translation)	5.I can use this word in a sentence. e.g.: _____ (if you do this section, please also do section 4)
1. Device					
2. Alternating					
3. Transmit					
4. Increase					
5. Decrease					
6. Adaptor					
7. Input					
8. Depends					
9. Ratio					
10. Output					
11. Fragment					
12. Plunge					
13. Rare					
14. Strike					
15. Yield					
16. Estimate					
17. Fraction					
18. Expose					

19. Concentrate				
20. Mixture				
21. Measure				
22. Distance				
23. Surface				
24. Similar				
25. Solid				
26. Unfit				
27. Lack				
28. Journey				
29 Destination				
30. Outward				

APPENDIX C

ETTVA Scoring Guide

Analyze student responses according to the following instructions. Add totals for each column, and write the score over 150.

1. If only 1 is marked:
        -award 1 point.

2. If only 2 is marked:
        -award 2 points.

3. If 3 is marked:
        -but no synonym is provided, award 2 points.
        -but a totally incorrect synonym is provided, award 2 points.
        -with a synonym that conveys at least a portion of the meaning, award 3 points.

4. If 4 is marked:
        -but no synonym or translation is provided, award 2 points.
        -with vague synonym, award 3 points.
        -with accurate synonym, award 4 points.

5. If 5 is marked:
        -with a vague sentence and no translation in 4, award 3 points.
        -but 4 is incorrect and sentence does not fully convey the definition, award 3 points.
        -with an accurate synonym in 4 but an inaccurate sentence, award 4 points.
        -with correct sentence and accurate synonym in 4, award 5 points.

APPENDIX D

Pre-Intervention Survey

1. Name: _____

2. Date: _____

3. Student's Name:_____

4. Language(s) spoken at home: _____

5. Date student moved into the United States: _____

6. Date student entered an American school: _____

7. Did student ever receive EL/ELL/ESL services:_____

8. Gender:_____

9. IEP Status: _____

10. Ethnicity: _____

11. Literate in native language: _____

* All survey results are confidential.

APPENDIX E

EL Vocabulary Squares

Brainstorm a semantic map with your knowledge of the word:	Look up the word in the dictionary. Restate the definition in your own words:

Word:

_____

Affixes:

Write one synonym and one antonym for the word:	Write a sentence using the word:

APPENDIX F

EL Tier Two Science Passages:
*Use Week 1 Text for Pre-test.

Tennessee Science: Grade 8

Week 1 (p. 418):

A transformer is a *device* that changes the voltage of an *alternating* current with little loss of energy. Transformers are used to *increase* the voltage before *transmitting* an electric current through the power lines. Other transformers are used to *decrease* the voltage to the level needed for home or industrial use...Transformers also are used in power adaptors. For battery-operated devices, a power *adapto*r must change the 120 V from the wall outlet to the same voltage produced by the device's batteries.

A transformer usually has two coils of wire wrapped around an iron core…One coil is connected to an alternating current source. The current creates a magnetic field in the iron core, just like in an electromagnet. Because the current is alternating, the magnetic field it produces also switches direction. This alternating magnetic field in the core then causes an alternating current in the other wire coil.

Whether a transformer increases or decreases the *input* voltage *depends* on the number of coils on each side of the transformer. The *ratio* of the number of coils on the input side to the number of coils on the *output* side is the same as the ratio of the input voltage to the output voltage.

Week 2 (p. 447):

Occasionally, chunks of extraterrestrial rock and metal fall to Earth. Meteorites are any *fragments* from space that survive their *plunge* through the atmosphere and land on Earth's surface. Small ones are no bigger than pebbles. Hundreds of meteorites fall to Earth each year. Luckily *strikes* on buildings or other human-made objects are *rare*. In fact, only a tiny *fraction* of the meteorites that fall are ever found. Scientists are extremely interested in those that are, because they *yield* important clues from space. For example, many seem to be about 4.5 billion years old, which provides a rough *estimate* of the age of the solar system. Several thousand meteorites have been collected in Antarctica, where moving ice sheets *concentrate* them in certain areas. Any rock seen on an ice sheet in Antarctica is probably a meteorite, because few other rocks are *exposed*. Meteorites can be one of three types- irons, stones, and stoney-irons. Irons are almost all iron, with some nickel mixed in. Stony are rocky. The rarest, stoney-irons, are a mixture of metal and rock.

Week 3 (p. 442):

Now you know a little more about how to *measure distances* in the solar system.

Next, you can travel *outward* from the Sun and take a look at the objects in the solar

system. Maybe you can find a nice *destination* for your next vacation. Strap yourself into

your spacecraft and get ready to travel. It's time to begin your *journey*. What will you see

first?

The first group of planets you pass is the inner planets. These planets are mostly

solid, with minerals *similar* to those on Earth…

The first planet that your will visit is the one that is closest to the Sun.

Mercury…is the smallest planet. Its *surface* has many craters. Craters form when

meteorites, which are chunks of rock or metal that fall from the sky, *strike* a planet's

surface…Because of Mercury's small size and low gravity, gases that could form an

atmosphere escape into space. This *lack* of an atmosphere and the closeness of this planet

to the Sun cause great extremes in temperature. Mercury's surface temperature can reach

425 C during the day and drop to -170 C at night, making the planet *unfit* for life.

Venus, the second-closest planet to the Sun, is hard to see because its surface is

surrounded by thick clouds. These clouds trap the solar energy that reaches the surface of

Venus. That energy causes surface temperatures to hover around 472 C- hot enough to

bake a clay pot.

Comprehension post-test:
(modified from text to include 10 Tier Two vocabulary words)

In an electric motor, a magnetic field turns electricity into motion. A *device* called a generator uses a magnetic field to turn motion into electricity. Electric motors and electric generators *depend* on conversions between electric energy and kinetic energy. In a motor, electric energy is changed into kinetic energy. In a generator, kinetic energy is changed into electric energy. As wires move, the electrons in the wire also move in the same direction. The magnetic field exerts a force on the moving electrons that pushes them along the distance of the wire, creating an electric current.

A battery produces direct instead of *alternating* current. In a direct current, electrons flow in one direction In an alternating current, electrons change their direction of movement many times each second. Some generators are built to *yield* direct current instead of alternating current.

The electric energy produced at a power plant *journeys outward* to your home by wires. Recall that voltage is a *measure* of how much energy the electric charges in a current are carrying. The electric transmission lines from electric power plants transmit electric energy at a high voltage of an *estimated* 700,000 V. *Decreasing* the energy is not an option. *Transmitting* electric energy at a low voltage is less efficient because more electric energy is converted into heat the wires.

APPENDIX G

EL Tier Two Vocabulary Words and Friendly Definitions

Week 1:	Week 2	Week 3
Alternating: switching back and forth	Fraction: Portion	Measure
Transmit: moving from one to another	Fragment: Piece	Destination: goal
Increase: to add	Strikes: Hits	Outward: able to be seen from the outside
Decrease: to lessen	Rare: Strange	Surface: flat part on the outside
Adaptor: something that changes	Yield: give	Unfit: not fit
Depends: needs	Plunge: Fall	Lack: not have
Device: object with a purpose	Estimate: Guess	Solid: object that keeps its shape
Output: what a device produces	Concentrate: centered	Similar: same
Ratio: comparing two numbers	Exposed: seen	Distance: length between two places
Input: what you feed into a device	Mixture: Combination	Journey: trip

APPENDIX H

EL Tier Two Vocabulary Intervention Script:

Monday:

1. Teacher: We are going to focus on words in the text that are not the regular vocabulary words; however, these words may affect your understanding of the passage.

Teacher: First, I am going to read the passage from your science textbook out loud to you. Then, we will focus on two words every day.

Teacher: *reads one of the following passages out loud: Week 1- pg. 418, Week 2- pp. 436-438, Week 3- pp. 442-444*

2. Teacher: We are going to use our vocabulary squares to analyze two words every day this week.

Students: *write the first two words for the week in the center of the squares and looks the word up in the dictionary.*

Teacher: *provides a friendly definition for each word* (see attached).

Teacher: Let's write the definition in our own words in our vocabulary square.

3. Teacher: Can anyone think of any other time we have seen this word? *Allow students to respond*. Let's draw a semantic map of this word using our examples.

Teacher: Now, working with your shoulder partner, add a synonym and an antonym to your vocabulary squares.

Students: *work with assigned shoulder partner to fill in the synonym and antonym square*.

Teacher: What did you decide? *Students respond. Teacher corrects any errors*.

4. Teacher: Word parts can also be important indicators of a word's meaning. Let's break this word into prefixes, suffixes, and root words.

5. Teacher: Now let's use this word in a sentence. *Asks for suggestions*. Let's fill in a sentence in our last square.

(*Repeat steps 2-5 on second Tier Two word of the day.*)

Tuesday-Friday:

1. **Teacher:** Review previous day's words with students.

2. Teacher: We are going to use our vocabulary squares to analyze two words every day this week.

Students: *write the first two words for the week in the center of the squares*.

Teacher: *provides a friendly definition for each word* (see attached).

Teacher: Let's write the definition in our own words in our vocabulary square.

3. Teacher: Can anyone think of any other time we have seen this word? *Allow students to respond*. Let's draw a semantic map of this word using our examples.

Teacher: Now, working with your shoulder partner, add a synonym and an antonym to your vocabulary squares.

Students: *work with assigned shoulder partner to fill in the synonym and antonym square*.

Teacher: What did you decide? Students respond. Teacher corrects any errors.

4. Teacher: Word parts can also be important indicators of a word's meaning. Let's break this word into prefixes, suffixes, and root words.

5. Teacher: Now let's use this word in a sentence. *Ask for suggestions*. Let's fill in a sentence in our last square.

(*Repeat steps 2-5 on second Tier Two word of the day.*)

Teacher: *Rereads comprehension passage out loud to students once new words have been taught. On Fridays, all 10 words are reviewed, so the comprehension passage is not read.*

APPENDIX I

Treatment Fidelity Checklist

Please listen to the recordings. Rate the interventionist on each item listed for each session:

Interventionist Name:_____

Date of Intervention:_____

Duration: _____

Does the interventionist display the following during the session:

1.   Begin the session with:
        A. a reading of a short passage (Monday)
        B. a review of the previous day's words (Tues-Thurs)
        C. a review of the entire week's words (Fri)
2.   Pronounce the day's words for the students.
3.   Have students write the word.
4.   Have students look up the dictionary definition of the word.
5.   Provide students with a friendly definition.
6.   Have students write the definition.
7.   Allow students to brainstorm a semantic network.
8.   Discuss the root words and affixes (where applicable).
9.   Give students time to discuss synonyms and antonyms.
10.   Allow students to compose their own sentence.
11.   Repeat the word, definition, and sentence.
12.   Have students keep a word folder.

APPENDIX J

Control Fidelity Checklist

Please listen to the recordings. Rate the interventionist on each item listed for each session:

Interventionist Name:_____

Date of Intervention:_____

Duration: _____

Does the interventionist display the following during the session:

1.   Begin the session with:
        A. a reading of a short passage (Monday)
        B. a review of the previous day's words (Tues-Thurs)
        C. a review of the entire week's words (Fri)
2.   Pronounce the day's words for the students.
3.   Have students write the word.
4.   Have students look up the dictionary definition of the word.
5.   Have students write the dictionary definition of the word.
6.   Repeat the dictionary definition to the students (or have students reread the dictionary definition).

APPENDIX K

EL Tier Two Comprehension Pre-test/Post-test:
*Use Week 1 Text for Pre-test.

Comprehension Pre-Test Questions and Answers:

1. What is this passage about?
Transformers

2. What are transformers used in?
Adaptors, batteries

3. What does a transformer do?
Changes electric current, increases or decreases the current

4. How is an alternating current created?
By using a magnetic core

5. What two places use transformers?
Power adaptors, power lines, batteries, walls (any two)

6. What is important about the ratio of input to output?
Must be equal

7. How is a magnet used in the transformation?
To alternate the currents, to create a magnetic field, a coil is wrapped around the
        Magnets (any one)

8. Why do you think a transformer might be useful?
(any logical response)

9. Why is it important for transformers to not lose energy?
(any logical response)

10. What does *ratio* mean?
A fraction, a part to whole (either one)

APPENDIX L

Comprehension Post-test Questions and Answers:

1. What is this passage about?
Electricity

2. How does a generator create electricity?
Transfers kinetic energy or uses a magnetic field to turn motion into energy

3. What two types of energy are required for this conversion?
Electric and kinetic

4. What type of current does a battery create?
Direct

5. What is the difference between direct and alternating currents?
Direct-electrons move in one direction; alternating- electrons move in two
        directions.

6. How is the energy created by generators sent to houses?
Through wires

7. At what voltage is the energy sent to houses?
700,000

8. Why must energy be transmitted at a high voltage?
More efficient

9. Why do you think generators are important?
Any logical response

10. What does transmit mean?
To send, to go

APPENDIX M

Post-Intervention Affective Survey

Name:_____

Scaffolding Content-Area Vocabulary Instruction

Post-Intervention Affective Survey

1. Rate your experience in the intervention on a scale of 1-10: _____
2. True or false: I learned a lot from the study.
3. True or false: I enjoyed being a part of the study.
4. True or false: I would participate in a study like this again.
5. The best part about the study was:_____
6. The worst part about the study was: _____

APPENDIX N

Interview Questions

Demographics

1. What is your first language? What was the language you learned first?
2. What is your family's native country? Where did you live before?
3. How long have you lived in the United States?
4. Who lives in your household with you?

Attitudes and Values

5. Do your parents speak English? How well?
6. What language do you use to communicate with your parents, grandparents, siblings?
7. What language do you use when you talk to your friends at school?
8. How do you feel about learning English? Why?
9. How do your parents feel about you learning English? Why?
10. How do your parents feel about learning English themselves? Why?
11. What language do you prefer to use the most? Why?

APPENDIX O

Parent Consent Letter

Principal Investigator: Danica Wright Booth
Study Title: Scaffolding Content-Area Vocabulary Instruction for English Learners
Institution: Middle Tennessee State University

Name of participant: _____
Age: _____

The following information is provided to inform you about the research project and your child's participation in it. Please read this form carefully and feel free to ask any questions you may have about this study and the information given below. You will be given an opportunity to ask questions, and your questions will be answered. Also, you will be given a copy of this consent form.

Your child's participation in this research study is voluntary. He or she is also free to withdraw from this study at any time. In the event new information becomes available that may affect the risks or benefits associated with this research study or your willingness to participate in it, you will be notified so that you can make an informed decision whether or not to continue your participation in this study.

For additional information about giving consent or your rights as a participant in this study, please feel free to contact the MTSU Office of Compliance at (615) 494-8918.

1. **Purpose of the study:**
   Your child is being asked to participate in a research study to investigate the benefits of various instructional strategies on student vocabulary knowledge.

2. **Description of procedures to be followed and approximate duration of the study:**
   1. Students will be tested using the Peabody Picture Vocabulary Test, a vocabulary test, and a comprehension test.
   2. Students will meet in small groups for 20 minutes a day with the teacher.
   3. Students will learn one of two different vocabulary learning strategies.
   4. Students will be retested at the end of the study on the vocabulary and comprehension tests.

   The study will be conducted over five weeks during the Fall Semester 2013 with the following time frame:
   Nov. 20-22: Pre-test
   Nov. 25-26: Intervention
   Dec. 2- 6: Intervention
   Dec. 9-13: Intervention
   Dec. 16-18: Intervention
   Dec. 19-20: Post-test

3. **Expected costs:**
   N/A

4. **Description of the discomforts, inconveniences, and/or possible risks that can be reasonably expected as a result of participation in this study:**
   Possible benefits of the study will include increased vocabulary knowledge and increased comprehension for EL students. Potential benefits outweigh any potential risks.

5. **Compensation in case of study-related injury:**

N/A

6. Anticipated benefits from this study:
a) Potentially improved Academic Vocabulary
b) Potentially improved Reading Comprehension

7. Alternative treatments available:
N/A

8. Compensation for participation:
N/A

9. Circumstances under which the Principal Investigator may withdraw you from study participation:
Researchers may withdraw students from the study for lack of attendance.

10. What happens if you choose to withdraw from study participation:
Students may withdraw themselves at any time during the study by speaking directly to Mrs. Booth, the primary investigator.

11. **Contact Information.**
If you should have any questions about this research study or possibly injury, please feel free to contact (Mrs. Danica Booth) at (615.353.2020)   or my Faculty Advisor**, (Dr. Amy Elleman)**at **(615.898.5688).**

12. Confidentiality.
All efforts, within reason, will be made to keep the personal information in your child's research record private but total privacy cannot be promised. Your information may be shared with MTSU or the government, such as the Middle Tennessee State University Institutional Review Board, Federal Government Office for Human Research Protections, *if* you or someone else is in danger or if we are required to do so by law.

14.**STATEMENT BY PERSON AGREEING TO PARTICIPATE IN THIS STUDY**
I have read this informed consent document and the material contained in it has been explained to me verbally. I understand each part of the document, all my questions have been answered, and I give permission for my child to participate in the study.

Date   Signature of patient/volunteer

Consent obtained by:

Date   Signature

Printed Name and Title

APPENDIX P

Interview Transcriptions

Interview 1:

Demographics

B: It is 3:33 on April 1, and we are doing the qualitative portion of, um, the intervention. Okay, so um, the whole point of this is to just get a gauge for what your native language is and when you use your native language versus when you use English. Okay? So just anything you want to say about anything that describes, um, your language, uh, feel free. I know it's hot and weird in here.

K: Yours is a lot more cooler.

B: Yeah it's cause I've got that open. I probably should open the window. It's so crazy in here. Okay, so hopefully ten minutes.

1. B: Okay, so what's your first language?
   K: Um.
   B: What did you learn first?
   K: it was a mixture, cause..
   B: Oh, okay.
   K: So like they didn't teach me exactly English because they didn't exactly speak it, and then, they didn't teach me Spanish because they wanted me to know some English. And so I ended up getting confused, and I didn't know what language to speak when I started school.
   B: Interesting. Okay, so, um, where did you start school?
   K: Um, it was Brooke Meade, but it closed down. Now it's Lead Academy.
   B: Um, okay.
   K: but, are you talking about like preschool?
   B: Well, anything, like where did you…
   K: cause I went to St. Mary Villa, Brooke Meade until…um, kindergarten through third, but then it closed down.
   B: Okay, okay.

2. B: Um, what's your family's native country? Where did you live before?
   K: My dad is from Mexico, and my mom is from Nicaragua.
   B: When did you move here?
   K: I was born here.
   B: You were born here?

B: Okay, but both your parents spoke Spanish?

K: um hm.

3. B: Okay, okay. That answers my next question. How long have you lived in the United States?

4. B: Um, who lives in your household with you?

K: Um, right now? My mom's friend and my cousins were to move, and they needed somewhere to stay, and then there's my dad and my mom and my sister.

B: Okay, is your sister older, younger?

K: She's younger. She's three.

B: Okay.

K: four.

B: Okay, but normally, it's just your mom, your dad..

K: And then my sister and me.

Attitudes and Values

5. B: Um, you just kind of answered this. Do your parents speak English? How well?

K: Um, my dad and my mom both speak English. My dad can't exactly write it, but my mom she speaks good, and she can write it well.

B: Okay, how did they.. oh.. what do they do?

K: My dad has his own, um, little business. It's called (indecipherable) Sunshine. And my mom she works on her own, and she cleans houses for like really rich people.

B: Okay, good, that's a good job.

6. B: What language do you use to communicate with your parents, grandparents, siblings?

K: Um, I don't talk to my grandparents cause they don't live in this country.

B: Okay.

K: And my relatives, we don't really talk, but when we talk, the cousins are younger, like my age, and we speak English, and with the older people, we speak Spanish because they don't really speak that much English, and with my parents, it depends on the situation.

B: Okay, so sometimes you'll speak some English?

K: We speak Spanish.

(interrupted by class)

B: I'm sorry. Okay, uh….

7. B: What language do you use when you talk to your friends at school?
    K: English.
    B: Oh. Just all English? You don't speak Spanish?
    K: I mean, with Felicitas I talk Spanish because we can speak Spanish, but no one here can speak Spanish.
    B: So just the people that, obviously, speak it?
    K: Yeah.

8. B: Okay, okay, um, how do you feel about learning English? Why?
    K: It was a necessary… It was necessary. If I was going to live in the United States and go to school here.
    B: So, so I mean, are you happy that's what you're doing? Or?
    K: Um, it's good that I know two languages.
    B: Okay, okay, that's good.
    K: So..
    B: So you like knowing both of them?
    K: Yeah. Because when I need to help, I can help translate something.
    B: Yeah! Have you ever had to translate?
    K: Um, my dad, he got, he had to go to the hospital cause he got a spider bite.
    B: um hm.
    K: And so we would go visit him, and there was this lady, and she was pregnant, and she couldn't speak English, so I had to translate, really panicked, and I was like six, and I could translate, and I was like she's having a baby. And they were like okay, okay, okay. So does she like feel any pain, and like yeah.
    B: Oh my god!
    K: so that was like a more necessary moment, but like sometimes, my dad, um, he, you now, he doesn't speak that good, so when he's trying to talk to something, or my mom, she wants me to check if she's writing everything right, and I help her, and in stores, there's sometimes people who don't know the language and who they are struggling and so it's nice to help.
    B: Okay. Very cool.

9. B: Um, how do your parents feel about you learning English? Why? You kind of answered that. You said they didn't want to teach you Spanish at first?
    K: No, um, my parents, they had lived, my dad had lived here for four years, and my mom only one year, and so, they were still struggling with speaking English right, and so at first they really wanted me to learn English, but they didn't know how to teach me, since they couldn't speak it. And so, at home they would speak

to me in Spanish, and when I went to school, I would have to pick up on English, so it was confusing which language to talk. How to talk.

B: Okay.

K: So I had a problem with that. But they really wanted me to learn English because I needed to.

B: but did they want you to learn Spanish, too? Or just..?

K: Yeah, because it's nice to like know your own language too because if you're like a Hispanic kid, and you don't know Spanish, it looks kind of funny, so..

B: Yeah. It's true. There are some people like that.

K: Yeah. And it's not right.

(laughing)

10. B: Um, how do your parents feel about learning English themselves? Why?

K: Themselves, um, my dad, he's trying to pick up, but he doesn't have time because he runs his own business, and, but, he like, when I, he says something wrong he asks me to fix or clarify him or he doesn't know a word, he asks me how to spell. My mom, she, she speaks well, and everything, and she can write really well, and like if you talk to her, you can't tell the difference, but, she says, "No, I need to get it perfect, and she's taking some classes every Sunday."

B: Oh! That's what I was going to ask. She's taking classes? Where does she take classes?

K: um, there's a school downtown.

B: That's cool. That's cool. For, like, adults?

K: For adults, yeah.

11. B: Um, what language do you prefer to use the most? Why?

K: Um, that doesn't really bother me, language. There's not any people, like, during my daily day, there's not really much people that can speak Spanish, other than my family, but when we go on vacation and stuff, we normally go with other relatives, so it's normally just Spanish.

B: Okay, where, uh, like do you go to.. Like where do you go on vacation? Like back to your…

K: For vacation..

B: family's home, or…?

K: When my grandpa was alive in Nicaragua, he died, like, but um, we use to visit him each year, and I would, we would be there for like three months, and then we would just speak straight Spanish. It's all we spoke over there. And then, it was like real nice. Because it's family you don't get to see. But when I was younger, I couldn't speak Spanish that well because I didn't have the practice, but when I

came back, I got a lot better. And when you go to, well you don't really have to travel far, but like when you go to Nolensville, or you go to Murfreesboro you got a lot of Spanish speaking over there. And so it's nice to understand when they're talking to you. Sometimes they can't speak it clearly. So yeah.

B: Uh, like, do you go to church?

K: Yeah, I go to church. We go to Spanish church, but it's bilingual too.

B: It's bilingual, too?

K: Yeah.

B: Okay, that's interesting. Are you Catholic? Or?

K: No, I'm Christian.

B: Oh, okay.

K: but most of my family's Catholic. But, um, Like the younger generations, they're the ones picking up on the English because they go to school here, but their parents aren't.

B: Well, fantastic. That's all I have. I appreciate you interrupting your… were you taking a test?

K: No I finished.

B: Oh, okay, was it hard?

Interview 2:

Demographics

B: I'm gonna record this. Okay…it is 1:35 in the afternoon, and it is April 1st, and we are doing the Qualitative Interview. Um, okay, so just tell me as much as you want to tell me, okay?

1. B: So the first thing I want to know is, what is your first language? What was the language you learned first?
    M: The language that I learned first was, Somali.
    B: Okay. Have you learned any other languages other than Somali?
    M: I don't think so.
    B: okay, okay, um.

2. B: What is your family's native country? Where did your family come from?
    M: My family they come from, like, I think the east. I think the east side of, um, Africa.
    B: Okay, did they come from Somalia?
    M: Yeah, they came from Somalia.
    B: Okay. Okay. Were you born in Somalia? Or?

M: No, I was born in Kenya.

B: Oh, so they were like Somalian refugees, and you were born in Kenya? Okay.

M: Right, you know they moved.

3. B: Okay, okay. How long have you lived in the United States?

M: Uh, 14 years.

B: Oh wow, so you were born and then moved really quickly moved.

M: no, no wait. I don't think it's 14 years, I think it's 8 years. Yeah.

B: Okay, okay. You're 14 years old? And you've been here since you were six?

M: Yeah.

B: Okay, okay.

M: I guess, yeah. I started first grade when I came here.

B: Okay. Where did you go to school?

M: Um, I don't remember, but it was somewhere in Richmont, Virginia.

B: OH! Have we talked about this? My people are in Richmond, Virginia. That's cool.

4. B: Okay, who lives in your household with you?

M: um, sisters, brothers, mom, dad, and my niece and nephew.

B: Okay, how many sisters?

M: I got. I got. I got. Actually, I got like seven sisters, but one of them lives at her house. I got one brother.

B: Okay. So you live with one sister, one brother? You? And a niece and a nephew?

M: No, no. Not one sister one brother. I live, I live with one brother..

B: And six sisters?

M: And six sisters. But I got seven.

B: One doesn't… ah.. Okay. Is she married? Did she move out?

M: Yeah, she's married, and she moved out.

B: Okay, wow. You live with a lot of people.

Attitudes and Values

5. B: Okay. Um, do your parents speak English? How well?

M: No.

B: No.

M: No, I mean my dad is trying to learn, he knows a little, kind of.

B: Does your mom try to learn English? Or is she…

M: Yeah, he try to learn.

B: What do your parents do?

M: Um. My dad works, and my mom, my dad he works like in the morning like til afternoon at 12, and then he comes back at like one or twelve at night, and my mom, she works til five, from five in the afternoon and til, until, like ten at night.

B: Wow. Does she, so she's gone when you get home?

M: I guess so. Like sometimes. But sometimes I come there, and then, like, she's there.

B: Oh okay, okay. Um.

6. B: So, what language do you use to communicate with your parents?

M: I use to communicate with my parents, Somali.

B: Somali. Always Somali?

M: Yeah.

B: Do you ever talk English to your dad?

M: Um, sometimes.

B: Like, when do you talk English to him?

M: Um.. I talk to him like (coughs) when I want like … something, like I want money to buy (indecipherable), and he understands, but like sometimes he try to like speak back and then he adds English with my country's language.

B: So he'll say it, he'll do it halfway? Yeah, they call that "Spanglish" when they do it with English and Spanish.

7. B: Okay, what language do you use when you talk to your friends at school?

M: Um language at school? Is English.

B: All, all English? You don't talk Somali to anybody?

M: Yeah, my sisters on the bus, on the bus, I talk to them in Somali.

B: oh, okay. Are there any…

M: But I don't speak my language because people don't understand it, and they always think that we're talking about them.

B: Yeah, yeah. People do that. I hate that. I hate when people say that.

8. B: Um, how do you feel about learning English? And why?

M: Um, actually, I feel good, um, because you feel like my mom, and them, they want like me to learn good English so I can go to college and stuff.

B: Okay, so your mom supports you learning English? She really wants you to?

M: (coughs)

B: Okay.

M: she wants me and when like I get bad grades she doesn't want, she likes me to do, so like when I grow up she can go back to her country. Like when I grow up, and like, she wants me to take her, her back to Africa

B: Oh, so make money so you can take her back to Africa? Okay.

M: And she want to go to Mecca.

B: What's that?

M: It's like this Muslim place.

B: Oh, Mecca!

M: Where people pray, and stuff, she wants to go there.

B: Oh, okay.

M: So, all her life, bad stuff she did, and then, you go there, and like all the bad stuff you did they forgive you for it.

B: For your sins?

M: Only if you like kill someone, it's like bad, and then if you kill someone it's just going to stay with you.

B: Oh, okay.

M: The other stuff, you know, they forgive you.

B: Do you, um, do you go to church?

M: No, I don't go to church. I only go to like (indecipherable) like where the Muslims pray, like where the Muslims go. I don't know what they call it.

B: Like a mosque?

M: Yeah, like a mosque. And I go there like on Fridays.

B: What language do you speak when you go there?

M: I speak my same language.

B: You speak Somali?

M: Yeah.

B: At the mosque? So it's a lot of Somali people?

M: And I speak English because some people don't, like some people don't… They speak Arabic. And then, I don't know what they say, so I speak just in English to them.

B: Oh, okay. So there's people there that speak Arabic and Somali? Other than your family? Cool. That's really cool. I would love to go to a Muslim mosque. I haven't been yet. I need to go.

9. B: Okay, uh, you actually already answered about how your parents feel about you learning English.

10. B: How do your parents feel about learning English themselves? And why?
    M: They feel like they really want to learn English, and like, take the citizenship test.
    B: Oh.
    M: Yeah, my dad is trying to like take it this summer.

B: Okay.

M: My brother already got his citizenship.

B: Do they go to any classes or anything?

M: My dad he don't go to classes, he just go and do some youtube stuff.

B: Oh!

M: He learns this conversation and stuff, like, and then when he always listen to it every night, and like try to get his English.

B: That's really cool. I didn't even think of that.

M: And then along with it, he (indecipherable) citizenship… he's trying to learn all that.

B: Do your brothers and sisters speak good English? Like, if you're, where are you, are you like the oldest of the seven?

M: No, I'm not the oldest. I'm like the third oldest. I mean like the fourth oldest. There's like three more in front of me.

B: Are your sisters as good at English? Your older sisters, are they as good at English as you are?

M: Um, they're.. my oldest one, she's not that good but like she came here, she tried like she couldn't get good, but she got good a little and stuff.

B: um hm.

M: She knows a lot more. Only, my sister in the third grade, she knows as much as me. She knows all the words and stuff. Big words and stuff.

B: So she knows, she knows all the words? That's cool.

M: Yeah, she translates all the words in English. Like, our language into English. Like I'm trying to learn to translate in our language. Some words are just confusing, and I don't know how to say, and I don't know how to say it, and I'm trying to learn from my language.

B: Have you ever like had to translate for your parents?

M: Yeah.

B: Yeah.

M: Yeah, I did.

B: Like at parent teacher conference?

M: I tried to, but and then, and then they just don't get what I'm saying so like to translate it back to English and some words, some big words, I can't say in my language. I know a lot of my language, but I could tell you, I could tell y'all what they say just like translate every word they say, but English when I try to translate to them, like it's hard.

B: That's interesting. Yeah, well cause you left when you were six, so you probably didn't yeah, you didn't encounter some of those words yet.

11. B: Okay, uh, what language do you prefer to use the most? And why?

M: (pause) I guess both.

B: Okay, why? That's okay.

M: I use, like, my language at home, and then I talk my language at home a lot, and then my friends too a lot, I talk English. And then when I come to school, I talk English. I talk English with my friends.

B: Okay, so it's a little bit of…

M: When I'm talking to my friends I just talk in my native language, but sometimes, I like have to say something in English.

B: So they do try, even when you're speaking English to understand?

B: That's all my questions. Thank you! How do you say thank you in Somali?

Interview 3:

Demographics

B: Tell me as much as possible. Okay. We're just trying to get some background knowledge connected to, so you're not just like numbers in the study, like we know something about you, okay? Um… It is April 2, 2014, and we are doing the Qualitative Interview.

1. B: Okay, so what's your first language?

P: Um. Science

B: First Language?

P: Oh. Spanish.

B: Spanish, okay.

2. B: What is your family's native country? Where did you live before?

P: Mexico.

3. B: How long have you lived in the United States?

P: Around 10 or 11 years.

B: 10 or 11 years? So you moved from Mexico to Tennessee?

P: Um hm..(nods)

B: Okay, how old were you?

P: three

B: three?, okay, okay good.

4. B: Who lives in your household with you?

P: My mom and my dad and my family.

B: So mom dad?

P: sisters and brothers.

B: How many people? Do you know?

P: Well we're like four brothers, me and my sister.

B: Oh wow. That's a lot of boys. Are they older, younger?

P: They're older.

B: Okay, okay.

B: Where did you start school?

P: Charlotte Park

B: So you went straight into an American school, you'd never been to a Mexican school?

P: Yeah.

B: Okay. Um. When you got to Charlotte Park, did you speak English?

P: No. I went to Pre-K.

B: No? Did you take EL classes?

P: Yeah.

B: Okay, Okay.

Attitudes and Values

5. B: Um, do your parents speak English? How well?

    P: A little.

    B: A little? Um. What do they do? What are their jobs?

    P: Um, my mom works in a restaurant and my dad works construction.

    B: Okay, do they have to speak English at their jobs?

    P: No.

    B: No? Oh, okay, that's interesting.

    P: Yeah.

    B: Um.

6. B: What language do you use to communicate with your parents, your grandparents, your siblings?

    P: Spanish.

    B: Spanish? It's all Spanish.

    P: Yeah, and then my brothers, English.

    B: Okay, so how old are your brothers?

    P: Um, they're 15 and 18.

    B: Okay, so they speak English pretty well?

    P: Um hm.

    B: Um, are they in school still?

    P: Yes.

    B: okay. So they learned English at school?

P: Yeah.

B: But your parents um just never went to school, never got to? Have they taken any kind of classes or anything?

P: Yeah they were.

B: They took some classes?

P: Yeah.

B: But they haven't learned enough that that's their primary language?

P: Yeah.

B: Okay.

7. B: What language do you use when you talk to your friends at school?

P: English.

B: English? Always English? Siempre?

P: Yeah.

8. B: Okay. How do you feel about learning English? Why?

P: Good because that helps me to get a job better, and they will need me if there's somebody that doesn't know how to speak English I will translate it.

B: Have you ever had to translate for your parents?

P: Yes.

B: Can you give me a situation?

P: Yeah, we were, uh, um, at the doctor.

B: um hm.

P: and my mom didn't know how to tell them, so I told them.

B: Oh wow. Did you ever have any trouble with it, or?

P: No.

B: No? You just were easy?

P: Yeah.

B: Wow. That's, that's really good.

9. B: Um, how do your parents feel about you learning English? Why?

P: Good because they told me I'll get a good education and stuff like that. Yeah, to get good grades, and they just told me to like talk to them in English or Spanish, it don't matter, just to learn both.

B: Okay, so they want you to learn both?

P: Yes.

B: They think Spanish is important, too?

P: Yeah. For high school, they want me to take Spanish.

B: Oh good, cause you never learned to write in Spanish?

P: Yeah.

B: Okay, okay.

10. B: How do your parents feel about learning English themselves? Why?

P: They feel good because, um, when they go to a store, they don't get embarrassed of not knowing and stuff.

B: So they want to learn English?

P: Yeah.

11. B: Um, what language do you prefer to use the most? Why?

P: Um, English because like I started school since pre-K, so I learned more English than Spanish.

B: Okay.

P: And that would be the best one.

B: Yeah, so there's probably things you learned..

P: Writing…

B: Yeah. So like you don't know Science stuff in Spanish?

P: No.

B: Alright, that's interesting. Okay. I think that's it. Yeah, I think that's it. Thank you very much! I appreciate it.

APPENDIX Q

November 19, 2013

Danica Wright Booth
Literacy Studies
Drw2v@mtmail.mtsu.edu

Protocol Title: "Scaffolding Content-Area Vocabulary Instruction for English Learners"

Protocol Number: **14-144**

Dear Danica Booth,

The MTSU Institutional Review Board, or a representative of the IRB, has reviewed the research proposal identified above. The MTSU IRB or its representative has determined that the study poses minimal risk to participants and qualifies for an expedited review under 45 CFR 46.110 Category 7.

Approval is granted for one (1) year from the date of this letter for 40 participants.

According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to provide a certificate of training to the Office of Compliance. **If you add researchers to an approved project, please forward an updated list of researchers and their certificates of training to the Office of Compliance before they begin to work on the project.** Any change to the protocol must be submitted to the IRB before implementing this change.

Please note that any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918.

You will need to submit an end-of-project form to the Office of Compliance upon completion of your research located on the IRB website. Complete research means that you have finished collecting and analyzing data. **Should you not finish your research within the one (1) year period, you must submit a Progress Report and request a continuation prior to the expiration date.** Please allow time for review and requested revisions. Your study expires **November 19, 2014**.

Also, all research materials must be retained by the PI or faculty advisor (if the PI is a student) for at least three (3) years after study completion. Should you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

Dr. William H. Leggett
Associate Professor of Anthropology
Department of Sociology and Anthropology
Middle Tennessee State University
PO Box 10