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Emerging Pathways: A Teacher/Researcher's Reflexive Journey Implementing Literacy-Based

Science Interventions with Adolescent English Language Learners

Jeffrey R. Mihlon

Reading and Language Doctoral Program

Submitted in partial fulfillment

of the requirements for

Doctor of Education

Foster G. McGaw Graduate School

National College of Education

National Louis University

April, 2017

EMERGING PATHWAYS: A TEACHER/RESEARCHER'S REFLEXIVE JOURNEY

IMPLEMENTING LITERACY-BASED SCIENCE INTERVENTIONS WITH ADOLESCENT

ENGLISH LANGUAGE LEARNERS

Submitted in partial fulfillment
of the requirements of
Doctor of Education
in the National College of Education

Jeffrey Mihlon

Reading and Language Doctoral Program

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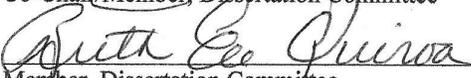
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Abstract

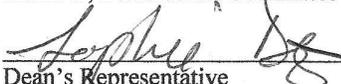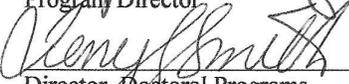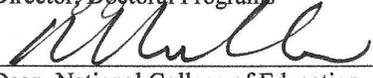This study explored the impact of instructional interventions with four Middle School English Language Learners in Science. The initial focus was to determine the impact of explicit academic vocabulary instruction, including cognates, and small-group guided discussions in order to facilitate the acquisition of cognates, academic vocabulary, and comprehension of scientific concepts. To accomplish this, various methods were implemented to gather data: observational and reflective field notes, a cognate-circling task, along with group and individual interviews. Upon the initial data analysis, an emerging question surfaced which added an additional dimension to the research, and shed light on the complexity of the teacher/research role. Thus, data analyzed and reflected both original and emerging questions, uncovering various patterns that impacted students' learning. It also provided insight into how a researcher's roles can affect the types and quality of data. Implications are provided for researchers, classroom teachers, bilingual teachers, professional development providers, and university programs developing new teachers.

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Acknowledgements

Robert Frost's famous first few words "two roads diverged" best represent the story of my doctoral journey. The path has been a long and arduous one. It began with a clear intent of becoming an "agent of change": a voice for those who are silenced, marginalized or striving to attain the quality of education they deserve. These difference makers must have the fortitude to push past obstacles that impede progress, and my intent was to move through and beyond those impediments. However, there surfaced a plethora of difficult choices along the various academic and social terrains I would have to cross. Suffice it to say, though there were certain decisions that led me momentarily astray, my compass ultimately directed me toward the euphemistic "light at the end of the tunnel." I have learned, persevered, believed, and achieved my goals. Having now faced these challenges, I realize now how much I have been truly humbled by them.

Being able to have the support and guidance through these trials from some truly amazing and gifted professionals allowed me to thrive. I express here much appreciation to each person who served on my dissertation committee: Terry Jo Smith, Kristin Lems, Ruth Quiroa, and Sophie Degener. To my dissertation chair Terry- you have been such an amazing listener, and have provided me guidance which allowed me valuable insight into such a complex arena. You have shown me how to see research through its most critical lens: research is about the human experience with no exact answers. You also guided me to see as a researcher that it is a necessity we examine ourselves and all our preconceptions, beliefs, and assumptions we bring to the table. Only then can we begin to understand and tell someone's story. To Kristin, Ruth, and Sophie- I have been honored that each of you had the support and faith in me through this difficult process. All of you have challenged me beyond what I believed could be achieved.

I would like to thank the four wonderful students who availed themselves as my case study participants. They gave up their own time because they wanted to improve upon their academic ability. They were patient with me and we had a lot of fun together during our shared lunch time over the course of the study. And, a thanks to the classroom teacher and colleague who welcomed me with open arms.

I would like to also acknowledge my wife Suzanne, without whom this would not be possible. Your continuing support and love has made an enormous impact on my success. Thank you for giving me the space I needed to think. Sometimes it is difficult to share how much you care for someone. Know that your belief in me truly helped me believe in myself. Know you are my rock and my success is your success.

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To the myriad of immediate and extended family, know I am happy to have such a loving group of people who always have supported and encouraged me. There are so many wonderful and caring people in my family that it would take up too much space to name all who have been "in my corner".

Finally, to my mentor Susan McMahon, who passed too soon- you were and will continue to be an inspiration. You guided and fostered my deep passion for literacy, constantly challenged me intellectually, and always had unfettered faith in my ability. I am forever grateful for your friendship and knowledge you bestowed upon me, and I was often humbled to be in your presence. You cared about me and always gave me a supportive hug whether we were

saying either hello or goodbye. You are so sorely missed by so many. I know you will be looking

down and will be alongside Terry Jo at the finish line with a congratulatory smile. I'll be looking

up.

Chapter One: Introduction

Each day that I enter my eighth-grade reading classroom, I see a "sea" of students; an array of young minds. They seek guidance not only within my class, but within all of their courses of study. Many would readily admit they struggle with vocabulary and comprehension, with most being English Language Learners (ELLs). It is a continuous challenge to meet their learning needs. An ELL, as defined by the National Council of Teachers of English [NCTE] (2008), is an active learner of the English language, whose first language is not English and can benefit from various modes of additional language support. Within my roles as a classroom teacher and literacy coach, I can attest to witnessing how ELL students actually are navigating two languages while learning complex academic concepts. In a school where the Latino population comprises more than half our student body, I have heard many of my literacy colleagues voicing concern and referring to these students as consistently "slipping through the cracks." Often these educators become frustrated because they are not "reaching them." This particular group of students is not just having difficulty within their Reading classes, but in other academic subject areas. They struggle with learning discipline- specific academic vocabulary in courses such as science, social studies, math, reading, and English. They often grapple with unlocking the meaning of words, either in isolation or while reading complex texts, which impedes the ability to understand deeper concepts. Having a limited comprehension hampers their ability to complete various reading tasks, such as seeking key ideas and details, summarizing and synthesizing, which frequently results in a trend of poor academic performance. Often, during class, ELL students would ask me word meanings, which provided opportunities to construct mini-lessons modeling and guiding "fix it" strategies such as the use context clues, word structures and syntax as tools to unlock word meanings. My intent was to focus their

comprehension on deeper meanings while they read so as to not interrupt the reading process. Still, they often conveyed visible frustration despite being provided with these strategies to become more metacognitive readers who can flexibly and independently apply these methods.

Yet, at the same time, strategies exist which can be implemented to guide ELLs acquisition of academic vocabulary. One of these is based on the Marzano and Pickering (2006) method which scaffolds students' understanding of academic vocabulary. It provides a multi-step approach of explicit instruction, visuals as mnemonics, discussion, and other opportunities which allow multiple experiences with academic words to understand how these academic words function in varied contexts. As a classroom teacher, I am aware that differentiating learning experiences to meet diverse learning needs of my students is crucial for their academic success. Thus, knowing approximately half of my students spoke Spanish, I decided to provide additional instruction by integrating cognates within the existing academic vocabulary framework to allow the ELLs to as an access to connect their first language to the academic vocabulary words being taught. Cognates are words that have similar spelling, meaning, and/or sound between two languages (Whitley, 2002). Based upon what my students orally shared within classroom instruction was that the use of Spanish cognates assisted them in activating some of their Spanish; and, it demonstrated some success in promoting these students' access to some of the words being taught within the reading classroom. Further, it illuminated an issue where I had not seen any positive impact of cognates outside the reading classroom. In other words, I did not know of any use of cognates with other academic disciplines (e.g. science, social studies, math, etc.). Using cognates is language specific; perhaps this explains the modicum of success within my own classroom.

In addition, I often provide students with multiple opportunities to discuss and negotiate understanding of their academic vocabulary, which reflects a core belief that providing social contexts are a key vehicle to learning. Thus, as I began to reflect upon how I support ELLs' learning of academic vocabulary, a research interest emerged. I pondered that if I could combine explicit instruction of academic vocabulary with cognate instruction, then provided an oral discourse component, would these promote ELL's academic vocabulary knowledge and comprehension? After all, ELLs possess their own language capital (Bourdieu, 1986). In essence, this could not only motivate them to learn using their own language, but could act as a scaffold to address academic vocabulary and comprehension in multiple discipline-specific subjects.

Part of my work as a literacy coach was to have instructional coaching conversations with teachers of all disciplinary areas. Of particular note during these conversations were frequent comments by several science teachers that a large majority of their ELLs did not have a solid grasp of the academic words nor the related concepts. These instructors shared that this issue surfaced in several ways, such as their classwork, written assessments, and frequent observations of ELL students' struggle with using academic vocabulary within different types of classroom discussions. Additionally, these teachers share that these students appear to "go through the motions" when completing work, such as science labs and other in-class work, by relying on non-ELLs who have a firmer grasp of the academic vocabulary. Further conversations with both teachers and ELLs led to my desire to seek ways in which both cognates and oral discourse could facilitate increased proficiency with academic vocabulary and related science concepts so that these students can thrive academically in science.

Problem Statement

National Association for Educational Progress (NAEP, 2015) and American College Test, or ACT, (ACT, 2015) found that ELLS are typically one of the lowest-performing demographic groups on various nationalized standardized tests**.** The performance of ELLs overall on national standardized reading assessments provides a window into a myriad of issues educators may be facing when teaching this population. NAEP released the "nation's report card", including reading scores, which revealed that only 21% of 8th grade ELLs were considered proficient, while 44% of English-only (EO) students were proficient. All NAEP tests are given in English. Similar reading data at the high-school level further indicates areas of need. The ACT is a standardized test comprised of four subtests (reading, math, English and science) each of which are both scored separately and together (to achieve a composite score.). Within Reading, only 31% percent of Latino students met or exceeded the ACT benchmark compared to 56% of White students (ACT, 2015). Both standardized measures demonstrate that ELL students' vocabulary is well-below what is considered a proficient level, and suggest a significant trend of underperformance within the ELL population.

Within my school district, ELL students' scores mirror those at the national level. On the Common Core State Standards Assessment, or PARCC (Partnership for Assessment of Readiness for College and Careers), only 29% of eighth-grade Latino students met or exceeded expectations in Reading in comparison to 54% of White students, along with only five percent of those deemed as "English Learners" (National Governors Association, 2015). Further, in relation to science, the 2014 seventh-grade state science assessment indicated a 44% achievement gap between ELL students and those considered English-proficient and a 14% achievement gap between Latino and White subgroups. These assessments point to significant

gaps in performance between ELLs and other demographic groups, indicating significant challenge with vocabulary and comprehension. Given ELLs' performance on these varied assessments, it can be inferred that these students may not be receiving adequate instruction. ELL students are still learning the English language; thus, their performance is likely to be affected.

Moreover, there have been dramatic increases in the number of ELLs in the US schools. In 1990, there were an estimated two million ELLs in the US. Today, there are in excess of five million—an increase of over 150. One in nine students are considered ELLs (Goldenberg, 2011). As of 2012, in my Midwestern state, Latinos comprise 59% of the ELL statewide population; and, for the school proposed in this study, 50.4% are ELLs. Thus, the population is changing dramatically and educators have the task of ensuring that these students maximize their learning potential. The fastest growing groups of students are ELLs at the secondary level (Hoffman, & Sable, 2006). It provides a challenge to ELLs' vocabulary and comprehension since reading in middle and high school is mostly subject-specific (e.g. science, math, history). These subjects are laden with higher-level academic vocabulary and typically draw on complex concepts.

In addition to increasing numbers of students whose first language is not English, many ELLs are from economically disadvantaged homes, correlating a vocabulary gap which persists throughout their schooling, creating a cycle of school failure (Blachowicz & Fisher, 2006; Hart & Risley, 1995). Moreover, Hart and Risley (1995) note that in general, the average amount of words spoken in low-come households is less than that spoken in more financial secure households. This reflects a significant vocabulary word gap. Further, in comparison to English-only students, ELLs have a significantly higher risk for academic failure (Ruiz-de-Velasco, Fix & Clewell, 2000). Though more than half, 57%, of ELLs are born in the United States are

"familiar" with the English language (Batalova, Fix, & Murray, 2005), this familiarity is vastly different than the academic language ELLs face. All of these factors present a significant challenge to their education.

Rationale for the Study

Aside from the dearth of data discussed above, this study is relevant because the majority of students I have taught over 17 years have been within this population. The challenges ELLs are confronted within science and other discipline-specific classes propelled my interest toward researching how to provide vocabulary and comprehension scaffolds in order to facilitate their academic vocabulary and conceptual learning. I chose science based on specific concerns expressed by teachers during my conversations with them, as well as my observation in science classrooms. Science is a subject which has many academically complex words which have morphological connections between English and Spanish (Kieffer & Leseaux,2012, 2007). It was evident, based on both standardized test results, my observations, and my experience, that students need to have an understanding of vocabulary relevant to a specific subject to comprehend texts. Since many of these cognates are often important to understand the concepts being studied, it is imperative to investigate how they can play a role toward scaffolding the learning of vocabulary so ELLs can gain deeper understandings.

Science is challenging to ELLs not only because they struggle with understanding academic vocabulary, but also because the concepts being studied apply the vocabulary within increased complex science processes. As a reading teacher, I have noticed multiple factors that are text "roadblocks" for ELLs. First, there the textbook's organizational patterns are challenging since the authors use these text structures to both illustrate and explain concepts. Science texts can include paragraphs that are organized with key words and phrases that indicate various

relationships within and across ideas, such as cause/effect, chronology, comparison/contrast, description, problem/solution and sequence. These text-based organizational structures can impede ELLs from connecting the words and ideas that are conveyed. Further, the more complex language and organizational structures within varied types of science texts are not typical to those which ELLs are familiar, potentially due to limited experiences and/or comprehension issues with these types of disciplinary-based texts in the classroom.

In addition to vocabulary and text structures, there are other factors which can obstruct ELLs' success in the science classroom. One of these is the instructional practices of teachers. As a literacy coach and classroom teacher, I have observed multiple instances of limited strategic reading instruction in subject-specific classes. If teachers support reading comprehension with strategic instruction by modeling metacognitive strategies to guide students' understanding of science texts, their students would be more likely to experience increased success in reading these texts, as they would be demonstrating increased metacognition (Baker & Bealle, 2009). Furthermore, the wide language difference between formal, scientific language and the typical conversational language used in science hinders their ability to understand. These differences in language require a shift in how these students read and interact with science texts.

Science education presents multiple academic challenges for many ELLs. Attempting to address all of them in one study would be next to impossible. Hence the focus of this research is on building academic vocabulary through the implementation of cognates and oral discourse. The study can contribute to understanding how ELLs' apply academic vocabulary and cognates when combined with multiple opportunities for oral discourse to determine their understanding of science concepts. Lee, Quinn, and Valdes (2013) point out that when incorporating "discourse-rich science practices, they become richer language learning environments as well as richer

science learning environments." (p.223)

The "Emergent" Nature of Qualitative Research and Design

Qualitative research naturally lends itself to addressing issues that are based in the social nature of language and learning. It is a dynamic research paradigm that allows for research in natural contexts. Its emphasis is on the quality of entities, processes and meanings (Denzin & Lincoln, 2000). The primary goal of this research is to examine multiple dimensions of learning and closely examine their impact- in a fluid manner. Qualitative research questions are socially situated and stress how social experiences are constructed and meaning is derived. Not only do these inquiries "answer" a question, but examine the relationships between the researcher and subject, and the situational contexts the shape them. (Denzin & Lincoln, 2011). It is the adaptable nature of research that makes it conducive to studying human dynamics.

As a researcher, I entered this process understanding the dynamics of such research. Yet, I was not prepared for how "messy" it became. Chaudry (1997) experienced disruptions, interruptions, unscheduled routines and became "plagued with conflicting loyalties" in her research. She recognized, through her reflective journaling of three differing vignettes, that she was not prepared for the switch of roles that occurred, and that researchers can enter into different identities based on differing purposes and relationships. In the first two of her three ethnographic vignettes with differing contexts, Chaudry shares various tensions and contradictions in her research as she struggles with the perception of feeling both disempowered and empowered within her Muslim culture. Though she is reflexive within her process, she becomes her own focal point of research in her last vignette, using her data to distinguish the factors she brought into each experience which may played a role in her research. The struggles Chaudry faced was not dissimilar to mine in terms of determining what I as a teacher and as a

researcher brought into my research experience. My reflective notes also would provide myself access to my own preconceptions. Entering into my research, I honestly believed that I could be completely objective and remove any type of subjectivity. This draws me back to Eisner (1992), who reflected "To be objective or to have an objective view is to see the things the way they are. We want to see and tell it like it is." I needed to think in this manner from the outset. When I initially began to collect my data, I did not consider the unpredictability of the "human" influence. Wolcott (1994) takes Eisner's view a step further- there is actually "no such thing as pure description." In other words, I could not remove what could not be "controlled". I had to be true to the purpose of my research and "must be scrupulously honest" (Wolcott, 1994) with myself. I refocused on issues that were initially created since I had adopted a specific research "persona" which generated issues with data collection; thus, I needed to re-examine much of the prior understandings I possessed about qualitative research.

It required me to attain a fresh perspective to uncover the various phenomena that occurred while I began collecting my data. Thus, I began to adopt an emergent design; that is, to employ an active decision-making process while examining data, and how my newfound discovery of multiple roles played as a researcher, a participant, and teacher. Looking into the types of dialogue on my part, instead of just a student response, now became important. This was the other aspect that needed additional consideration to paint a complete picture of an interactional context. This again was reflected in an article I recently re-read by Eisner (1992), as he points out "the teacher's rapport and relationship" along with "the teacher's personal style are all candidates for attention." In any case I realized I could adopt an emergent design- a design in which the researcher makes ongoing decisions based on what is being learned (Lincoln & Guba, 1985). An expansion of the research questions and focus took place not due to any inadequacies

on my part, but rather to inquire into how each of my roles and perspectives may have impacted the data I collected.

I simply was unaware of the realities that created and changed the research contexts. These appeared to start occurring at the beginning of research implementation. Knowing there was a possible issue, I began to seek ways to account for these phenomena. Lincoln & Guba (1994) discuss how emergent design is a qualitative study design that progresses in response to initial observations during the course of a study. Additionally, it allows new research questions to emerge. In my study, I recognized during the initial week that I too had embraced multiple roles as researcher, participant and teacher. From this I realized that I could ascertain a deeper understanding relating to my data and findings.

This then, broadens the study, and provides insight into the complexities of the setting, the phenomena of teaching and learning and of qualitative research. It also accounts for the critical nature of human dynamics. I had not considered this aspect of research during my design, and needed to consider these social interactions as critical data. Thus, an additional research question emerged as I began to analyze my data.

Research Purposes and Questions

The purpose of this study is to investigate how the use of cognates and oral discourse can facilitate native Spanish-speaking ELL students' disciplinary literacy with academic vocabulary in science and enhance their understanding of scientific concepts.

The following are the research questions that inform this study:

1. How do ELLs show awareness and apply knowledge of academic vocabulary in science?

2. How do ELLs develop their understanding of science vocabulary through the

awareness of cognates?

3. How do ELLs transfer cognates to other science vocabulary through metalinguistic

awareness?

4. What is the relevancy, if any, of oral discourse to facilitating native Spanish-speaking

ELL students' vocabulary acquisition and conceptual understanding in science?

Emergent Question:

5. How did my different roles as a teacher and researcher impact how the study was

enacted and interpreted?

Chapter Two: Literature Review

Introduction

This literature review focuses on several interrelated themes pertaining to the study of

cognates, oral discourse and academic vocabulary: a) theoretical perspectives within a

sociocultural context; (b) theoretical perspectives of comprehension as related to ELL students

(c) the relationship of oral discourse and comprehension including research supportive of its use

as an instructional scaffold; (d) analyses of studies of vocabulary with ELLs relating to

morphology, word consciousness and cognates, all of which are the key to facilitating word

knowledge for ELLs; and (e) studies related to academic vocabulary and academic discourse,

which are essential to constructing deeper conceptual understandings with ELL students.

Theoretical Perspectives on Comprehension and Vocabulary

The main theory that informs this study is sociocultural theory. This theory is woven and

reflected throughout the review of studies presented.

   Sociocultural Theory. Lantolf and Thorne (2006) view sociocultural theory (hereby

referred to as SCT) as social and cultural interactions that stimulate mental activity, or thinking.

In other words, students learn through sign systems embedded within social interactions and

influenced by culture. This theory was developed by Lev Vygotsky (1978), who posited that

language is the key component that promotes thinking, develops reasoning, and provides a

vehicle for reading and writing. One way to view this is that it is both the brain and culture

working together to construct thinking and learning (Vygotsky, 1986). He also theorized that all

children are equipped with certain basic mental functions (such as memory). These mental

faculties become more developed through environmental and cultural interactions. Vygotsky

(1978) states "It may be said that the basic characteristic of human behavior in general is that

humans personally influence their relations with the environment and through that environment personally change their behavior, subjugating it to their control" (p. 51). Essentially, he asserts that socially embedded, relevant interactions are the core for human beings to become more independent thinkers while deepening their understandings among various learning contexts. A simple example of this would be that if a child lost a toy, she might not know where to start looking for it. A "more knowledgeable other," one who has a deeper understanding and is more accomplished with the task or concept to be learned, such as a parent, may guide the child by asking, "Did you look under your bed?" It is the language exchanged between the child and parent, which allow him or her to connect the memory to locate the missing object. The temporary assistance that the parent provides using language provides the impetus for the child to develop a mental framework for solving this and similar problems. Thus, the intertwining of the cultural context and language use allows for, and promotes, higher-order thinking; since, according to Vygotsky (1978), the language within a culture helps to develop deeper thinking, then instruction for ELLs should make explicit the process of relating existing knowledge of language to learning in various disciplinary areas.

Not only did Vygotsky note the importance of language and culture in the development of thought, he also posited that this language use needed to be chosen carefully for it to impact learning. This is achieved within a "zone of proximal development" (ZPD), which Vygotsky (1978) defines as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." (p. 86). Lantolf and Thorne (2006) state the ZPD is the difference between what a learner can do with help of an adult/teacher and what he or she can eventually do without their help.

According to Gee (2008), reading can be considered as a socially-constructed meaning-making activity; that is, the teacher is the mediator, who models for the students enabling them to create a mental process for learning. When considering ELLs, this becomes significant because the teacher can not only help them learn academic vocabulary but he or she can also help them develop linguistic connection to their first language. After the interaction in the classroom environment with a knowledgeable other, students can independently use language as a "tool" to direct their thinking to be able to associate their previous knowledge to a new concept (Wood, Bruner, & Ross, 1976). This shows how the knowledgeable other influences their thinking.

To extend the above argument, one can consider mediation as the key to the sociocultural lens of thinking and learning (Wertsch, 2007; Lantolf & Thorne, 2006). Mediation, according to Lantolf (1994), "is understood to be the introduction of an auxiliary device into an activity that then links humans to the world of objects or to the world of mental behavior" (p. 217). In relationship to the classroom, teachers can offer mediation to students in a variety of ways, such as explaining words and concepts using student-friendly language and/or by activating students' background knowledge. Moll (2000) summarizes mediation to learning as follows: "To put it simply, human beings interact with their worlds primarily through meditational means; and these mediational means, the use of cultural artifacts, tools and symbols, including language, play crucial roles in the formation of human intellectual capacities" (p. 257). The proposed research uses cognates and oral discourse as the mediating tools. A sociocultural perspective on the acquisition of language through social and cultural means informs this study considerably, while shaping its purposes, questions, and data gathering tools.

While Vygotsky's ideas present a theoretical framework for how higher order thinking occurs, he did not elaborate explicitly on how the "more knowledgeable other" promotes

learning. Wood, Bruner, and Ross (1976) developed the concept of "scaffolding" learning that incorporates "those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (p. 76). This implies giving levels of assistance that are commensurate with the ability of the student. This notion parallels Vygotsky's zone of proximal development (Tompkins, 2003; Gavelek & Bresnahan, 2009). The above arguments converge on the agreement that socially-mediated learning activities are key both to learning and to cognitive development.

Additionally, there are other significant considerations when providing a temporary thinking bridge, or temporary learning scaffold, for their students. For example, Galda and Beach (2001) argue that cultural and historic worlds along with reading tools that are used with students be considered as factors in their learning. Students not only bring forth their own conceptions about certain concepts into the learning context, but they also have embedded belief systems. This is important for the teacher to consider when choosing the type of instruction and mediation they provide to students. So, if a student is given instruction that is not culturally relevant to them, he or she is less likely to engage both in their reading and the degree to which they will socially engage in responding (Galda & Beach, 2001; Raphael & McMahon, 1994). However, when cultures and belief systems are used as a learning scaffold or mediating tool, it makes the learning more motivating, more meaningful, and will lead to deeper thinking about the learning material from the student. Au (1993; 2002) furthers this contention stating that various cultural interactions within one's own environment (such as school) should be a part of learning, which utilizes their own cultural and linguistic capital. This is relevant in classrooms across the United

States as more and more students are entering schools speaking languages other than English and coming from cultures not necessarily apparent to teachers.

Sociocultural theory as a vehicle for reading instruction. Sociocultural theory considers a range of various interrelated factors that can impact a child's literacy. Au (1997) situates the argument by stating how our experiences are mediated by culture and environment. She furthers this by stating that culture is a stable persistent factor, yet also an unstable factor because it constantly changes and evolves and so do the experiences and knowledge gained by the learner. Students' cultural and worldly experiences assist in framing their knowledge and beliefs of the world around them. This has a distinct relationship to the vocabulary they learn both in school and at home. Consider books students read; they mentally situate themselves in a social conversation with the author as they are engaged during reading and are cognitively engaged in the process. In relation to comprehension, Au (1997) points out that the texts that are read convey language in which one connects schemata and other social interactions. This implies that interactions that students have had in their environment build their conceptual and background knowledge and impact their comprehension. In addition, it has been referenced that Latino students are marginalized in terms of not being able to bring their own "funds of knowledge" (Moll, Amanti, Neff, & Gonzalez, 1992, p. 134) from their cultural and environmental experiences to their learning. It has often been termed a "deficit model" of instruction in the pedagogical sense. In other words, the wealth of knowledge which ELLs bring to the learning situation in a typical classroom is not being utilized to enrich these students' learning experiences.

Several key literacy organizations also recognize the social component of learning to reading. Both the International Literacy Association's Standards for Reading Professional's

(2010) first standard and the National Council for Teachers of English's (NCTE) Components of

Effective Reading Instruction (2004) discuss how learning takes place through social interactions

(i.e. the use of language). They cite the gradual release of responsibility as a key part of reading

instruction. The RAND Reading Study Group (2002) also recognizes that social engagement

allows for constructive collaborations that can lead to broad conceptual knowledge. Moreover,

the National Reading Panel (NICHD, 2000) recognizes sociocultural framework when discussing

interaction between peers through cooperative learning and its effectiveness in relation to reading

comprehension.

By offering an opportunity for social interactions through scaffolded opportunities for

learning and recognizing culture as part of learning, sociocultural theory provides a vehicle

through which reading comprehension can be enhanced and acquiring academic vocabulary can

increasingly possible for ELLs.

Analyses of Studies on Comprehension Instruction and ELLs

Many reading researchers agree that constructing meaning is the ultimate goal. It should be

noted that there has been a significant body of research on reading comprehension. However, a

majority of that research has been focused on those who are students whose first language is

English (Lesaux & Geva, 2006). Nevertheless, the means to which comprehension is achieved is

dependent upon multiple factors such as vocabulary knowledge (Anderson & Freebody, 1981),

activating schema (Anderson, 2004) and metacognition (Baker & Beall, 2009; Baker & Brown,

1984). Vocabulary entails not just instantaneously recognizing a word, but activating associated

prior knowledge to apply its meaning while reading. Metacognitive strategies, such as being

aware when to stop to reread, using word structures figure out unknown words, or being able to

interact with the text (questioning, responding, etc.) during the reading process assists in

constructing deeper understandings about text. ELL students, though, have an increased cognitive demand due to the areas discussed above, all of which contribute to comprehension. Additionally, these are bilingual students whose first language is not English. Sociocultural theory recognizes both language and culture as critical to the development of higher-order thinking and deeper-level comprehension.

Oral Discourse and Comprehension

The sociocultural view recognizes the social, cultural and background knowledge, all of which critical components to any reading activity (Prater, 2009). In other words, there are multiple components that interact with one another to mediate understanding.

One of these critical influences on reading is the impact of schema on learning. This derives from schema theory, which recognizes that reading is an interactive process and that a reader's schema, or background knowledge, plays a role in learning (Anderson, 2004). Because of this, it serves as a natural scaffold (Anderson, 2004). Prior theoretical models, such as cognitive ones, did not fully take this complexity into research and instructional practice. The schemata ELLs bring into the learning situation include their native language, Spanish, a central component to ELL learning, is linked with sociocultural theory as a component of culture. This is noteworthy since culture and language are interwoven. Further, as a mode of instruction, using oral discourse, which is part of language, would not only be related to this theoretical lens, but would be instructionally relevant for ELLs.

There have been a number of studies linking oral discourse and comprehension; however, for the purpose of this review, only studies that are relevant to this proposal will be reviewed. To begin, Langer, Bartolome, Vasquez, and Lucas (1990) conducted a study focusing on how twelve bilingual fifth-grade students could negotiate meaning in English and Spanish texts.

Students were provided fiction and nonfiction selections, and answered questions after reading a series of passages. Next, they were to discuss what they learned. The questions provided were designed to foster conversations that could provide a window into the various strategies they used to construct meaning. These inquiries centered on genre, organization, language and content from a given text. The questions that provided most insight about their learning were open-ended questions, which provided students opportunities to discuss their learning, rather than provide short answers. Conclusions determined students' construction of meaning was more of an influence than their language proficiency, and participants had more success with fiction than non-fiction. This indicates when students engage in oral discourse, questions should reflect opportunities to develop their responses. Given the lesser discussion with non-fiction, questioning scaffolds and/or building schema prior to reading may provide the ELL student with increased success.

Also, using interviews as a component of research, Garcia (1991) studied 51 Latino students and 53 Anglo students in the fifth and sixth grade, of high, average and low-performing levels to determine factors that impact reading comprehension. Additionally, 12 Latino and six Anglo students were chosen for an open-ended interview. The Latino students were orally proficient in both Spanish and English. The researcher developed and administered a reading comprehension test with open-ended written responses, a standardized vocabulary test, and a prior-knowledge test. Initial quantitative analyses of both populations of students indicated that the English students significantly outperformed the Latino students. However, when controlling for background knowledge, there were no significant differences in the scores, implying that schema was the reason for these students' performance. However, while doing "open-ended" interviews of students, the Latino students pointed out that they had quite a bit of difficulty with

passages with unfamiliar vocabulary. The researcher points out that the interview allowed the Latino students to provide a "full" explanation of their thinking. This may indicate when designing research with ELLs that enabling them to express their thinking processes can provide further insight and reliance on strict numerical data may be insufficient.

Alternatively, using a case study focusing on three different performing Latino students, Jimenez, Garcia, and Pearson (1995) conducted research based in cognitive and metacognitive knowledge. The researchers selected their participants based on background questionnaires, standardized test scores, teacher recommendations, and correlating comprehension scores on standardized test with students' ability to thinking aloud while reading. They chose a student who was a proficient Spanish bilingual reader, a proficient monolingual reader, and a less-proficient bilingual reader. As with the other study above, they constructed a prior knowledge assessment for each passage; however; in contrast, they provided students with a short introduction of the topic, then had students compose something written related to it. Students would read and were asked to think aloud either with a prompt or without a prompt. Interviews of each student were conducted with all questions about reading, with general questions about why they read and the purpose of reading, followed by specific questions related to bilingual reading.

Findings indicated that monolingual reader used many strategies to build comprehension. The proficient bilingual reader focused on vocabulary to help build understanding, and used her knowledge of cognates to assist with unlocking word meanings and was metacognitive in going back and forth between both languages, activating schema then applying. On the other hand, the less proficient bilingual reader did not use Spanish to unlock word meanings, and stated they were "confusing". This reader relayed the difficulty of using both bilingual strategies and

metacognitive meaning-making strategies interchangeably. The researchers suggest that that the student who had difficulty may not have been given enough guidance to interact between the two languages. They imply that it may be due to models of reading that they assert are for "Anglo" students. The use of the interview provided the researchers with clear understandings of bilingual students' process of thinking as they navigate words and text. It also suggests the need for a variety of scaffolded instruction to help bridge word and passage comprehension.

Later, Jimenez and Garcia (1996) broadened the 1995 study discussed above with a larger sample of eight proficient bilingual readers, three less-proficient bilingual readers, and three proficient monolingual readers to provide a deeper exploration and explanation of bilingual reading strategies. Similar to their prior study, they provided students with a short introduction of the topic, and had students compose something written related to it. Students again would read and were asked to think aloud either with a prompt or without a prompt. Interviews of each student were conducted with questions about reading, with general questions about reading, followed by specific questions related to bilingual reading. With this research however, there was a retelling component added to the think aloud phase to "double check" certain comprehension issues that students were experiencing. Findings from this larger sample indicated that the results of the prior study further substantiated that the proficient bilingual reader possess an "awareness" of knowing how and when to use a variety of strategies, such as the use of cognates to help identify and/or understand the meaning of a word as well being able to be flexible with metacognitive strategies when their comprehension starts to suffer, and could actively use those strategies while reading to convey understanding. The less successful Spanish students did not possess adequate metacognitive strategies and when to implement them. Interestingly, both higher and lower-performing Latina/o readers struggled with some

vocabulary, impeding their ability to construct meaning. In this study, there was an indication for further research to facilitate English and Spanish in a "cross-linguistic" way.

Analyses of Studies on Vocabulary Instruction and ELLs

It has been shown over many years that vocabulary is critical for comprehension for students (Anderson & Freebody, 1981; Biemiller 2004; Snow, Burns & Griffin, 1998**).** This is also the case with ELL students (August & Hakuta, 1997; Carlisle, Beeman, Davis & Spharim, 1999; Jimenez, Garcia & Pearson, 1996**).** A wide array of vocabulary is required to become a proficient reader. ELLs, though, need to acquire a substantial amount more vocabulary to catch up to the EO students (Ordonez, Carlo, Snow, & McLaughlin, 2002). This has significant implications in terms of comprehending what they read. This is even more critical if one considers how many words that EO speakers know by the end of high school, about seventy-five thousand (Snow & Kim, 2007). Research conducted with ELLs by Jimenez, Garcia, and Pearson (1996) confirms that lower vocabulary knowledge leads to poor comprehension performance. These are the same students who often struggle to achieve comprehension and develop a negative attitude toward reading. Negative experiences with reading contribute to a cycle of frustration and failure with reading throughout their schooling and they typically avoid reading (Hart & Risley, 1995). This is important to note because vocabulary knowledge is a significant predictor of comprehension at the middle and high school levels. These students also are still developing their English vocabulary while learning the meanings of words in a new language.

To know a word suggests knowing several things about the word, such as its literal meaning, its various connotations and its morphology (Graves, 2000; Nagy & Scott, 2000). Additionally, instruction and practice with specific word meanings can also raise students' word consciousness, their awareness and interest in words and their meanings. (Graves, 2006; Stahl &

Nagy, 2006). Therefore, educators must ensure instructional techniques are appropriate to the age and ability of the reader (Blachowicz & Fisher, 2006; NICHID, 2000), including ELLs. Blachowicz and Fisher (2006) attribute the limited aspects of word-learning instruction as teachers merely providing definitions for students so that focus is only on discipline-specific instruction. This lack of student knowledge of word-learning strategies hinders them toward understanding larger concepts in discipline-specific areas.

Heibert and Kamil (2005) promote using language interactions such as discussions and to guide students to not just know words, but also understand the unfamiliar vocabulary in their reading. In comparison to the amount of research with ELLs in relation to comprehension, the research that has been accomplished related to vocabulary is more recent (Graves, August & Mancilla-Martinez, 2013). However, they point out there have been "a limited number of experimental studies were located that focused on vocabulary outcomes for ELLs" (Graves, et al., 2013, p. 18). Further, much of what is researched to teach vocabulary to those students who speak English as their native language can be applied to ELLs.

Morphology. Morphology is the study of the smallest meaningful units in word structure (Kieffer & Leseaux, 2007). These meaningful units include prefixes and suffixes, and root words. Cognates, words that look similar and have a meaning that is similar in two languages (Kieffer & Leseaux, 2007), typically in English and Spanish, can also be considered a part of morphology since they can have some of the same meaningful units. These morphological units provide the reader with a strategy to decipher a whole word they may not know (Kieffer & Leseaux, 2007). It is important to note that over half of new words students encounter in texts for school are derived forms whose meaning can be achieved through analysis of word parts (Nagy & Anderson, 1984), beginning with an awareness of morphemic structure. There have been a

large number of studies relating to morphology, however a vast number of these studies were conducted with only elementary students.

One study, which is referenced often as evidencing morphology as playing an important role in helping derive word meanings was conducted by Nagy, Diakidoy, and Anderson (1993). The main goal in their study was to focus on the students' acquisition of common derivational suffixes. Derivational suffixes, according to the authors represent the most abstract and difficult aspect of morphology that students must learn. Further, they can change how a word is used in a sentence and have meanings that usually contribute to the meaning of the derivative. The researchers studied 630 students between fourth and tenth grade. They investigated if there was growth of suffix knowledge after fourth grade after syntactic awareness and test taking skills were taken into account. Twenty rarely occurring suffixed words and a multiple-choice item were tested to assess the students' knowledge of the contribution of the suffix to determine if the suffix of the word had more of an impact than the stem. The researchers found most development between fourth grade and seventh grades with significant variation of suffix knowledge within those grades. High school students' performance showed they did not do well on derivatives suggesting that suffix knowledge was insufficient.

Carlisle (2000) researched the relationship between knowledge of meanings of morphologically complex words and awareness to determining word meanings. The research questions were: 1) What is the relationship between children's knowledge of the meanings of morphologically complex words and their awareness of word structure and use? 2) Does awareness of structure contribute significantly to their definitions of morphologically complex words? 3) Is there a significant relationship between awareness of morphologic structure and reading morphologically complex words? and 4) To what extent does awareness of

morphological structure, the ability to read morphologically complex words and knowledge of morphologically complex words contribute to reading comprehension?

Thirty-four third graders and 26 fifth-grade students were given three different test measures: a word reading test to assess their ability to read morphologically complex words, a test of morphological structure designed to test students' awareness of morphological structure and a test of vocabulary knowledge. Students studied showed a significant link between the awareness of structure and morphologically complex words and also indicated that this awareness contributed to reading comprehension.

Kieffer and Lesaux (2007a) also examined the relationship between morphological awareness and reading comprehension in English with ELLs. The study included 111 students who were in fourth and fifth grade in a large urban school district, 87 of whom were ELLs. The study sought to see how students' ability to break down words was related to their vocabulary and reading comprehension. The students were given morphological awareness measures and asked to extract base words from derived words in order to complete a sentence. Next, reading comprehension was measured using the Woodcock Language Proficiency Battery-Revised Passage Comprehension subtest in which students were asked to read a paragraph with a word missing and fill in the missing word. The researchers controlled for word reading accuracy, non-word reading accuracy, sight words, phonological awareness and depth of vocabulary knowledge. The findings indicated that there was a morphological relationship to comprehension between fourth and fifth grade. In fifth grade, morphological awareness was found to be a significant predictor of comprehension.

In a longitudinal study with morphology and vocabulary focusing on ELLs students, Kieffer and Lesaux (2012) sought to know the average rates of growth of morphological

awareness and in vocabulary knowledge between a cohort of fourth and seventh grade Spanish-speaking ELL learners, and if Spanish-speaking ELLs with more rapid rates of growth in morphological awareness also demonstrated more rapid rates of growth in vocabulary knowledge. Vocabulary knowledge was measured using the Peabody Picture Vocabulary test. Morphological awareness was measured by a morphological decomposition task, which required students to remove the base to complete a sentence. Control measures were in place for word reading accuracy, non-word decoding accuracy, sight word reading efficiency and phonological awareness. A quantitative measure of latent-growth modeling indicated a strong relationship in both rates being measured.

Interestingly, even though they found strong growth rates, the ELLs still performed well-below national norms. The researchers commented that since there was a strong relationship found between morphological awareness and vocabulary knowledge, there is a need to have more instruction in place that will address the ELL population of students due to their lower levels of oral language.

Word Consciousness. Word consciousness is a type of metalinguistic awareness, an ability to reflect on and manipulate language structures (Nagy, 2007). It is awareness about the parts of words as students read, how they change and develop, and a motivation, appreciation and interest to learn new words (Scott & Nagy, 2009; Blachowicz & Fisher, 2006; Graves, 2006). Researchers such as Graves and Watts-Taffe (2002) see word consciousness as "crucial" to a learner's success to expand the breadth and depth of word knowledge. Based on their research, Nagy and Anderson (1984) estimated that students could encounter 88,533 different word families in texts in grades three through nine. Scott and Nagy (2004), point the need for instruction which fosters word consciousness and argue that the development of this is a

foundational part toward acquiring academic language; and by ensuring it is part of daily instruction, students develop control over language and can negotiate meaning with academic language.

It is metalinguistic awareness (Scott & Nagy, 2004; Graves, 2006) that allows the ability to think about and manipulate words both morphologically and syntactically. Recognizing how words parts contribute to overall meanings of words is possessing morphological awareness. Syntactical awareness refers to reflecting and manipulating word order in a sentence to infer meaning. This awareness allows for recognizing the power of words and the particular importance of word choice by authors (Scott & Nagy, 2004). By doing this, students will be more conscious to think about how and why a word is used. The studies in this section link word consciousness as a building block toward learning word meanings and promoting comprehension.

The Gift of Words Project (Skobel, 1998) stemmed from collaborative exchanges from teachers and universities who worked together for seven years in which teachers spent time using word learning strategies throughout their school day, resulting in students' motivation and exploration of words, even in other areas. The original premise was to focus on word consciousness through language. For the Gift of Words project, the use of novels and poems were the types of texts chosen to investigate their inquiries since the texts had words and structures that provided students opportunities to critique and analyze.

With instructional modeling and scaffolding by a teacher, students could discuss particular phrase or word that grabbed their attention. The Gift of Words inquiry was based on the premises that students need to learn to appreciate words so that they can spend more time with them; and that direct instruction accompanied with a wide range of reading is important. They asserted that

through explicit instruction accompanied by discussion, students would become more metalinguistically aware of words and pay purposeful attention to certain words in various texts. Since they describe writing in novels and poetry as a social language, they would be the phrases that students could choose and adapt to their writing. According to one fifth-grade teacher who discussed how her students would collect a "Gift of Words Bank", a collection of rich descriptive words and phrases from their own readings from a wide range of texts to incorporate into various types of writing. While this teacher guided students in creating narrative story categories, another fifth-grade teacher focused on specific words to build word consciousness so that students could critique the use of what they deemed to be a lack of descriptive words of character and setting in picture books. Students would then rewrite sections to show more in-depth descriptions. The teacher-research group commented that a focus on words in general rather than teaching specific words was essential for building word consciousness.

This research showed growth of students' vocabulary and how to apply it. Moreover, teachers recognized that empowering students in the choosing the words and discussing the words allowed for higher-order understanding. This not only builds their lexicon, but also promotes their awareness to words and how they function in differing conversational contexts. Additionally, it transferred into students writing, promoting natural awareness of choosing specific words for particular purposes.

In a longitudinal study, Miller, Gage-Serio, and Scott (2010), explored how 4th grade students learned vocabulary through word consciousness as part of the VINE (vocabulary innovations in education) project for three years. The project sought to have teachers develop their own word consciousness and determine how research could examine their instruction. Their purpose was to determine, through a case study, one teacher's experiences as a control and a

participating subject over three years how practices and outlooks changed over time. Their study uses videotaping, semi-structured open-ended interviews and observation data. Initially as a member of the control group in the study's first year, one participant-teacher's perspectives were just to become a better vocabulary teacher. Following his year as a study participant, he was chosen randomly from a pool of teachers for a case study. After being given professional development revolving around word consciousness, the teacher was then asked to incorporate word consciousness into his daily instruction.

During his first year as a case study participant, he was unfamiliar with the idea of word consciousness and no evidence was found of teaching metacognitive awareness of words. After the study as a participant during the second year, the teacher exercised much more choice when selecting words for students and how those words would be incorporated into various elements of reading instruction, with focus on choosing vocabulary that was more meaningful for students. As a result, the teacher stated that with placing emphasis on those words within writing he started to notice the students embedding those words into their daily writing.

Another such transfer of word consciousness was noted as the teacher made students aware of the power of words in advertisements. Students then started to organically choose those types of words and begin utilizing them in their writing. At the end of the second year the teacher commented how he had made word consciousness part of instruction, and made analyzing language more "game-like and challenging." The third year of the case study, his perspectives had completely shifted and he commented how his being word conscious with instruction guided his students to be able to independently recognize the knowledge about nuances of words, build an interest around them, and begin applying them in context. The authors discuss how over

three-year period noted how both the teacher and students felt much more enthusiastic, grew

confidence and became more capable when learning new words.

Cognates. As morphology and word consciousness are pieces to the vocabulary and

comprehension puzzle, cognates serve a similar function. Cognates are words that have similar

meaning, spelling (orthography) and form that are common between two languages (Whitley,

2002). The focus of this proposed research uses cognates from English and Spanish. Nash (1977)

distinguished about ten to fifteen thousand cognates that were similarly orthographic, indicating

a number of cross-linguistic similarities. This is significant to note, as August, Carlo, Dressler,

and Snow (2005) suggest phonological or sound factors are important for ELL students cross-

language transfer for those who are not literate in their native language. This adds to idea of

linguistic similarities, as some sounds from cognates share sound relationships to words in

English.

Moreover, because many academic vocabulary words and rare words in English are

derived from Latin, many academic words have cognates which are common in Spanish, being

either semantically or orthographically similar to English words (Nagy et al, 1993b). Such

academic vocabulary is present in the science classroom, the location for this study. This

suggests a metalinguistic awareness of cognates may play a critical role in developing both

academic vocabulary and subsequent understanding of what is read. Carlo et al. (2004)

distinguished 68% of academic words in middle school, which were judged to be difficult were

also English-Spanish cognates. There have been substantial studies in relation to cognates, so

focus in the review of studies will be limited to those that are related to middle school students or

upper elementary grades and English language learners. Although, here have been numerous

studies on cognates, the overwhelming majority focus on tier one, basic vocabularies, and/or focus on the early elementary grades.

Hancin-Bhatt and Nagy (1994), published their initial investigations to investigate the cognate recognition abilities of students at different grade levels to determine any trends. Their subjects were 196 Latino bilinguals from fourth, sixth and eighth grades. Three tasks were used to assess students' knowledge of Spanish and English vocabulary and the relationships between the two words. They were first given a translation task, which required the participants to provide translations of English words in context, which used both cognate and non-cognate words. Next, they were given a "yes/no" vocabulary test asking if they knew the meanings of the words. Non-words were also included in this test. Third, a matching task was used to determine relationships of suffixes between English and Spanish. Students would be given an English word and asked to choose the translation between four derivationally-related Spanish words. This was designed to see if they could determine relationships in morphology between the two languages. They found a "rapid" increase between fourth and eighth grades with cognates. They did not necessarily attribute this to a growing vocabulary in English since the words they used to test were low-frequency words. Cognate words with suffixed stems (e.g. tranquility) were recognized substantially more than those that did not have them. The researchers also point out that even though their knowledge of English suffixes substantially grew, it was still relatively low. They conclude with their initial beliefs that students can use their first language to improve vocabulary in their second language.

As part of a Vocabulary Improvement Project, where the focus was to create an intervention to enhance fifth graders' vocabulary Carlo, August, McLaughlin, Snow, Dressler, Lippman, Lively and White (2004), conducted a quantitative study with the purpose to see how

teaching students to use their first language would unlock the meaning of second-language words in a variety of contexts and through word knowledge (spelling, pronunciation, morphology, syntax and depth of meaning). Five key questions guided which words to teach, which aspects of word knowledge to focus, and the types of instructional activities to use. They included: which words, how to introduce the words, how often to revisit the words, which aspects of word knowledge to focus upon, and what instructional techniques should be used.

The study population included 254 bilingual and monolingual students from nine fifth-grade classrooms, with 142 English Language Learners and 112 EO students. Ninety-four ELL students and 75 EO students were in the intervention, the rest were in typical classrooms. Students were pretested in fall for the curriculum to be taught: deeper representation of word knowledge, polysemy, morphological knowledge, and inferring meaning from context. For fifteen weeks, there was a specific instructional sequence. Approximately ten to 12 words were introduced at the beginning of the week, followed by 35-40 minutes of instruction for four days. Every fifth week there was a review of the prior previous weeks' target words.

The intervention was centered on the topic of immigration, and teachers used a wide variety of written sources. During the week, ELL students were given the texts and accompanying audio on Monday in Spanish before texts were introduced the next day in English. Tuesday, teachers provided whole-group instruction of words and giving all students the text. That instruction would be accompanied with a task that had students infer the target word meanings from context. On Wednesday, there would be two different cloze exercises with heterogeneous groups; one that would focus on a target word in context, and the other would use the focus words in other themes to deepen understanding. The second was focused on how words could be polysemous. Thursday, there were word activities based on word association, analyzing

semantic features and synonyms antonyms). Friday, activities would vary but would have focus on word analysis (roots, derivational analysis, etc.).

Multiple measures were used to determine gains. These included: PPVT-R (Peabody Picture Vocabulary Test-Revised), polysemy production (generating as many sentences as possible with polysemous words), reading comprehension using cloze passages, word mastery (target words followed by definitions from which to choose), word association (matching target words to words which have semantic associations), and a morphology task, comprised of target and non-target words which asked students to locate base words. The results showed that a curriculum with a variety of tools to improve word-learning strategies displayed growth for both English Language Learners and EO students. They also emphasize the effectiveness of direct instruction of vocabulary for both populations. Aside from statistical measures, the researchers note that students became more aware of Spanish-English relationships and the relevancy of material engaged students, but did not discuss any causality. A need for further research in determining how each component works individually was recommended.

In another study, Malabonga, Kenyon, Carlo, August, Louguit (2008) developed a Cognate Awareness Test (CAT) and hypothesized that knowledge of high-frequency Spanish words would help students with high cognate awareness to understand the meaning of low-frequency English words. Prior to this study was another cognate awareness measure constructed by Nagy et.al. (1993); however, the current researchers pointed out a limitation to that study stating that there was no testing in relation to reliability. So, it was important that part of the research in this study determine their CAT to be reliable. In any case, they designed a CAT using low-frequency English words; half were Spanish cognates with high-frequency in Spanish, and the other half were non-cognates. Low-frequency English words were chosen based on the

research of Biemiller and Slonim (2001) which indicated that word frequency is a primary method in how children acquire words. Participants in this first pilot study were 173 fourth and fifth graders from a low-income, mainly Spanish-speaking neighborhood. The results of the pilot study showed the reliability of the items and the researchers made several revisions.

The second, operational study used the same students. Given along with the CAT were the Spanish WLPB-PV (Woodcock Language Proficiency Battery-Picture Vocabulary) and the English WLPB-PV. Findings from the studies show that awareness to cognates are related to vocabulary knowledge from the first language, Spanish, to the second language, English. Higher scores on cognate items showed higher scores on the Spanish WLPB-PV than the English WLPB-PV, but higher scores on the non-cognate items showed higher scores on the English WLPB-PV. This suggested that doing well on the CAT implied general vocabulary knowledge.

The researchers recommended seeking how students use knowledge to help them with English meanings and suggest the instructional implications of using instructional to guide students to determining a cognate, such as modeling different aspects teachers use to unlock the meanings of the new words, whether it is phonological, orthographic, semantic or a combination. Moreover, they suggest that using cognate awareness could potentially serve as an intervention to build English vocabulary. One of the goals, as suggested prior, is to build a cognate awareness through the thinking process in which the teacher acts as the knowledgeable other to scaffold higher-order thinking. This is done for students as a think-aloud, where the teacher models their thought process aloud.

In relation to scaffolding, Montelongo, Hernandez, Herter, Cuello (2011) conducted a study that scaffolded vocabulary acquisition for ELL students through cognates as a metacognitive, meaning-making strategy used when they encounter unknown words. The authors

point out that cognates are not something that is automatic with English language learners. These cognates need to be "carefully taught" (Lubliner & Smetana, 2005), and students should know that there are cognates can range in similarity; from those that are very similar in orthography and meaning to those that are not related at all in meaning. They believe that teachers need to use these students' funds of knowledge (Moll et. al, 1992) to enhance their vocabulary and reading comprehension.

The purpose of their investigation detailed how cognates could be used to enhance understanding and appreciation of text. They achieved this through modeling a context clue strategy to fourth grade ELL students with six different types of clues: synonyms, antonyms, definitions, examples, appositives, and punctuation. The researchers modeled how to use different types of context clues. For example, if during reading an unknown word was seen in a sentence, they would then read the next sentence for synonym context clues. If an unfamiliar word was "gathered", for example, they would look at the following sentence for words that might have a similar meaning. The word "collected" was found, and the Spanish cognate was "collecionar". This led to an understanding of a sentence, and the majority of students were successful with the strategy. Students also developed a deeper appreciation of the novel they were reading and celebrated their successes. Montelongo et al. (2011) also point out how this strategy would enhance reading comprehension since English language learners are able to use their first language

The cognate advantage. It is becoming clearer that there is an advantage for ELL students use of cognates but the advantage has "yet to be documented in research" (Lubliner & Heibert, 2011); however, many cognates yet are "essential to comprehension" (Nagy & Heibert, 2010). Many English language learners do not take advantage of these Spanish-English cognate

pairs because they do not have the cognate "awareness"; in other words, they are not noticing them (August et.al. 2005; Garcia, 1991; Nagy, 1995; Nagy, et al., 1993). This is part of morphological awareness and, as pointed out above in the review of research on morphemes and morphemic analysis, has been shown to contribute to reading achievement, independent of vocabulary knowledge (Hancin-Bhatt & Nagy, 1994; Nagy, Berninger & Abbot, 2006). Thus, cognate and cognate awareness are ways to both accelerate their word knowledge and understanding of text (August, Shanahan, & Escamilla, 2006; August et. al, 2005). Cognates, as a component of morphology and metalinguistic awareness, play significant roles within developing vocabulary.

The studies that were discussed above relating to cognates show significant potential for ELL students. Even though they were extremely limited to mid-elementary years and did not adequately address the needs of middle school these students, many of the cognate studies showed growth, albeit using strict quantitative measures. It should be noted though many of the studies above lacked opportunities to provide discussion as a study component that would scaffold learning for English language learners; however, a scant few did include instructional provisions for ELL students. Also, many did not reflect the schema the ELL students possess. As stated earlier, ELLs come to school with various "funds of knowledge" (Moll, Armanti, Neff, & Gonzalez, 1992), that they can use to decode meanings of words and assist with comprehension.

The issue becomes how to assist ELL students becoming aware of their linguistic advantages so they can apply them with varied texts. It is argued that even those English language learners who were born in the United States and have varied levels knowledge of English language, are still at a disadvantage due to the vocabulary gap discussed earlier (Hart & Risley, 1995). For example, Hart and Risley (1995) discuss a vocabulary word gap and note that

the amount of words spoken in homes in relation to low-income, which revealed that impoverished homes had less language exposure than financially stable homes. This becomes profoundly evident at the middle school level. If instruction can model and guide students by thinking aloud how to find cognates, it could act as an important scaffold in developing their own "cognate awareness", unlocking various academic word meanings and facilitating comprehension.

Intentional Teaching of Select Words

In addition to using cognates to teaching vocabulary to ELL students, many of the studies relating to both morphology and cognates state the need to intentionally teach words. Most teachers, though, would propose choosing words that most frequently appear in English (Fisher, et.al, 2011), and those used in discipline-specific texts. Biemiller (2001) argues that there are a relatively small number of words that need to be learned and that root words should be the focus. While this may have some merit, and can provide a morphological scaffold for certain words, Beck, McKeown, and Kucan (2008) argue to teach words that "characterize written text- but are not so common in everyday conversation" (p. 7). They define these words as tier two words. Additionally, they discuss that the most difficult words are subject-specific that are discipline related, such as in science. These are called tier three words. For many English language learners, both tier two and tier three words are of particular difficulty, as opposed to conversational vocabulary they typically use in writing or in daily conversation in home or at school. For the purposes of this study, it is focused on middle school students because the majority of classes are subject-specific and heavily laden with academic vocabulary.

When it comes to teaching words, though, there is no one single instructional method; yet, vocabulary is most effective when learners are given definitions of a word and how a word is

used in varied contexts (Beck et al. 2008; Graves, 2006). Modeling how words have relationships and connections to other words through strategies such as semantic mapping (word relationships) help develop deeper conceptual understandings, which can assist with complex subject-area content. In addition, Graves (2009) emphasizes repeated exposures to words in a variety of contexts over time will enable students to actively process the meaning(s) of these words. This is particularly beneficial for all ELL students in building their vocabulary knowledge by having varied opportunities to build vocabulary through multiple linguistic modes. Even when considering the research above, Scott, Jamieson-Noel, and Asselin (2003) found that with fourth through eighth grade students, only 1.4% of time was spent on vocabulary instruction in subject-specific disciplines and most of that instruction was simply mentioning meanings and assigning the vocabulary words to be learned independently. Considering the above, there is a need to provide English language learners multiple opportunities for exposure with academic vocabulary words.

Since ELL students are encountering a large amount of academic vocabulary, there are other scaffolding techniques that can be used. Graves (2012) and Beck et al. (2008) discuss different techniques to mediate ELL learning of vocabulary. Along with word consciousness, using morphology and cognates and using the student's first language in class can bridge the language gap. Relevant instruction that reflects English language learners' prior knowledge, and using real world contexts can be instrumental in understanding unfamiliar words. Middle school ELL students are at a disadvantage to their non-ELL students' peers when they are receiving the same instruction as their English-only (EO) peers in a typical middle school classroom, such as an immersion setting where all ELLs students only receive whole-group instruction. The key is that a strategic combination of differentiated approaches tailored for English language learners

can be critical to their vocabulary development (Helman, 2009). In essence, it requires an array

of instructional tools to assist these students in learning discipline-specific vocabulary.

It's All Academic

      Academic vocabulary. The use and instruction of academic vocabulary is key to

understanding words used in a variety of subject areas. In middle schools, English language

learners face increasing academic challenges as they are "pushed" beyond simpler elementary

English texts. Most struggling readers can decode words accurately, but do not comprehend for a

variety of reasons. A student with limited vocabulary knowledge will have difficulty

comprehending texts despite an adequate development of word-recognition and phonological-

decoding skills (Rand Reading Study Group, 2002). With specialized vocabulary, issues with

vocabulary become more problematic for ELL students as they continue in middle and high

school. Snow and Kim (2007) specifically point to the lack of academic vocabulary knowledge

as a barrier to student success. The sheer number of these terms that are in content-area texts and

introduced through teacher instruction can be daunting for them.

      Additionally, ELL students struggle with reading as evidenced through various

standardized tests suggest that these students are likely experiencing difficulty with vocabulary.

Beck and McKeown (2002) label the content-specific vocabulary as tier three words. These are

words that also can be associated with or themselves be concepts in a unit of study. There are

also tier two words that are considered academic vocabulary and a necessary component of

developing an academic "language" (Nagy & Townsend, 2012); however, this study will mainly

focus on tier three words. Bravo, Heibert, and Pearson (2007) contend that many tier three words

are part of "worldly phenomena"; that is, occurrences in which ELL students are surrounded by

in their everyday lives, where students learn the words but may not consciously think about them

in their own lives. Without the knowledge of this type of vocabulary, it can hamper students' comprehension with informational text, the predominant type of text used in discipline-specific classrooms. Furthermore, at the middle school level, instruction must strive to not only promote their understandings of words through scaffolding, but to provide them an additional vehicle for comprehending complex concepts presented to them. One such tool is the use of academic vocabulary instruction, which can enable students to both decode and construct a bridge of understanding to connect to larger concepts.

In reviewing research focusing on academic vocabulary, there is much research that considers all tiers of vocabulary (Beck and McKeown, 2002). However, for this literature review, the focus will be on studies that reflect middle school English language learners and academic vocabulary interventions. As mentioned prior, one way to enhance ELL student's vocabularies is to build morphological awareness (MA). In an investigation by Kieffer and Box (2013) hypothesized that MA facilitates the development of an expansive academic vocabulary promotes deeper comprehension. The rationale is that a majority of morphologically complex words in English have meanings based on their parts (Nagy & Anderson, 1984). They investigated two hypotheses: 1) Does MA make indirect contributions to reading comprehension via academic vocabulary among linguistically diverse sixth graders? and 2) To what extent do these relations differ for English language learners compared to non-ELL students? There were 137 students from which 55 spoke exclusively English and 82 who spoke Spanish at home. Reading comprehension used six subtests from the Gates-MacGinitie Reading Test with both narrative and expository passages.

Morphological awareness was assessed using a non-word suffix choice task. Academic vocabulary was measured through students choosing synonyms for a given word with multiple-

choice items. The academic vocabulary words were chosen from the Academic Word List (Coxhead, 2000) and an 18-item original task from Lesaux and Kieffer (2010), which included morphologically complex words. Silent word reading fluency was also measured. Using a multivariate path analysis, the researchers show correlations evidencing MA contributing to reading comprehension via academic vocabulary, and an indirect effect significant for ELL students and non-ELL students. It also contributed to reading comprehension through word reading fluency. One finding that was not expected was the relation between academic vocabulary and reading comprehension, as it was not as strong for English language learners as for non-English language learners. They attribute this to lower levels to academic vocabulary or that students have reached a "threshold" and developed ways to comprehend through other "mechanisms".

Although this quantitative study presents correlational evidences that there are relationships between morphological awareness, academic vocabulary, comprehension and silent reading fluency, the research seems to overlook the ELL students' linguistic capital and its possible relationship to the above findings. In other words, it presupposes that not only do these students have a possible "limit" to their academic vocabulary lexicon, but also English language learners must be utilizing other "mechanisms" to decode and decipher text to comprehend. The quantitative research does not account for possibilities that these skills could interact or work in conjunction with one another. Qualitative research could account for why and how students are cognitively creating these relationships. Their results, though, render a series of questions: How do the ELL students construct their meaning? What access to academic vocabulary do they already possess within their native Spanish language? Are they showing metalinguistic awareness by thinking of cognates, which are semantically and orthographically similar to

certain words? If so, which ones? If not, what if cognates were taught explicitly to ELL students? Would they then be able activate their morphological awareness and provide additional explanation for results the researchers found? Hearing and seeing the thinking through interviews, observations and discussions could further this research and provide more conclusive evidences.

Other studies, though, that have had a focus on academic vocabulary have also incorporated other components of instruction as part of their overall intervention. One study that investigated effectiveness of academic vocabulary through a multicomponent instructional routine was conducted by Vaughn, Martinez, Linan-Thompson, Reutenbuch, Carlson, and Francis (2009). Their purpose was to determine how instructional routine developed to enhance effective outcomes for ELL students influence students' performance in vocabulary and comprehension. There were two experimental studies with control and treatment groups in which investigation would span one school year. Each control group was provided typical instruction randomly selected seventh-grade students. Typical instruction included teachers reading certain passage from text, teaching key idea and using videos. Treatment groups were exposed to explicit academic vocabulary instruction, videos and purposeful discussions, graphic organizers and paired grouping. A daily instructional routine began with an overview of the larger concept followed by explicit vocabulary instruction using Spanish cognates, student friendly definitions and visuals with paired discussions of the word. A video clip that related to the text reading in which students would have key questions to focus upon prior to the video would be followed by a teacher-led discussion. Next, teachers read aloud to students, who would have to think about two or three questions that revolved around the key lesson ideas in a discipline-specific text. After reading, students would work on answering given questions in pairs. To conclude the

intervention lesson, either a graphic organizer or a brief writing activity was used for students to include essential information learned where teachers provided feedback. Students worked with partners for 12 to 20 minute spans during a 50-minute lesson.

There were two treatment measures that were used. First was a researcher-developed pre- and post-test to measure understanding of content, consisting of matching vocabulary as well as identifying and explaining key ideas for comprehension. Post-test scores were analyzed through a three-level analysis of covariance for revealed statistically significant differences between the treatment and control groups for both comprehension and vocabulary. The researchers found that treatment students improved in vocabulary and comprehension in relation to the subject-specific discipline significantly more than the control group. They point out providing opportunities for engagement and explicit and deeper teachings of academic vocabulary were key components. Another key finding was English language learners who had the intervention gained vocabulary at the same pace as those students who were not ELL students. This study reflects an integrated approach with the use of explicit instruction and providing multiple opportunities to engage in discussion. Although the study is quantitative in its measures, sociocultural theory is reflected within the interventions. This was accomplished through the use of recognizing and utilizing cognates with ELL students and scaffolded oral discourse opportunities for students.

A study that used multi-faceted approach to academic vocabulary instruction, with a focus on linguistically diverse urban middle school students, was conducted by Lesaux, Kieffer, Faller, and Kelley (2010). In this large quasi-experimental study of 476 sixth graders in seven middle schools, the majority of whom were ELL students, researchers were guided by three specific research questions: 1) What is the impact of an academic vocabulary program on the vocabulary and reading comprehension of language minority learners and their native English

speaker classmates enrolled in urban middle schools? 2) With what level of fidelity was the program implemented and what do teachers report about ease of implementation, and 3) In what ways did the instruction as implemented contrast with standard practice?

The intervention that was used by teachers was the Academic Language Instruction for All Students (ALIAS). This text-based intervention was constructed of eight two-week instructional units, where students have multiple experiences with academic vocabulary words that were chosen from the Academic Word List (Coxhead, 2000). The program was 18 weeks with eight two-week units, eight-day lesson duration and two one-week review units. Daily lessons were 45 minutes within the context of a school's English language arts block, and 90 to 120 minutes daily. Every unit was centered on short pieces of informational texts with approximately eight academic vocabulary words chosen for study.

The eight-day instructional cycle included whole-group, small group and independent learning activities that were designed for "deep processing" through listening, speaking, reading and writing. Some of the activities that used these modes of learning included using context clues and concept mapping, creating and writing own definitions and writing to the theme using vocabulary words, using text-based questions using the target words, orally sharing with other students, illustrating target words and using them in sentences, crosswords, morphology through direct instruction, whole-class instruction and through writing, multiple meanings for target words, and various word games. The idea was to "build up" word knowledge "piece by piece" through ALIAS.

The researchers compared pre- and post-test scores on a variety of quantitative measures, which included target word mastery, morphological decomposition, word meanings in context, the Gates-MacGinitie Reading Comprehension test, and the SAT-10 reading vocabulary test.

Significant program effects were found on the researcher-developed vocabulary measure targeting knowledge of words taught, knowledge of word meanings in context and morphological skills. What was not significant was the standardized measure of reading vocabulary. The researchers account for this by stating the words that were used are sampled from a different domain compared to the academic vocabulary words in the study. At the same time, fidelity of implementation was high across all lessons, and teachers who had prior to implementation viewed the intervention as being difficult to implement now viewed the program as extremely beneficial and worthwhile. In contrast with other programs, data supported the claim that their instruction changed toward that ALIAS approach with more focus on vocabulary and collaborative discussions, having students explain their thinking, on word choice in writing, and on graphic organizers. This is in contrast to the control group, which had a majority focus and emphasis on literary text with little vocabulary instruction.

The study shows promise in a variety of areas. First, the use of larger instructional blocks of time dedicated to the language arts as part of a multicomponent curriculum illustrates the importance of reading and writing as critical to building academic vocabulary. Additionally, incorporating collaborative discussions and explaining thinking, although housed in the study's cognitive framework, does reflect some social and cultural approaches to learning, including the scaffolded process of the incremental learning to build knowledge and conversations embedded as part of instruction.

Academic discourse. Since language is a mediator for learning vocabulary and fostering comprehension, studies that examine academic conversations (both teacher to student and student to student) can shed light into how middle school ELL students' ability to integrate word knowledge in socially- constructed ways to derive meaning. Combining academic vocabulary

instruction and academic language in a socially mediated construct has the potential to shed important knowledge relating to how this population of students can derive deeper conceptual understandings in Science. There is ample existing literature over the last several decades detailing the importance of oral discourse as an effective instructional tool in classrooms. However, the focus of this section will focus on exploring relationships of discussion to developing deeper levels of thinking, and the relationship of oral discourse to academic language use toward promoting deeper understanding of scientific concepts.

With teacher and student talk as a primary focus of their research, Wolf, Crosson, and Resnick (2005) examined the nature of classroom talk and rigor of a reading comprehension lesson within the scope of 21 reading comprehension lessons from first through eighth grade. They sought to view teacher-student interaction to discover in which characteristics of a teacher's talk facilitates a rigorous discussion to extend students' understanding of concepts and critical thinking. The researchers observed teachers' reading comprehension lessons on two differing data collection times. To collect their data, they analyzed two of four parts of the Instructional Quality Assessment (IQA) tool: accountable talk in the classroom and academic rigor. The IQA toolkit has 16 rubrics for lessons and six rubrics that rate the quality of the assignments for the above-mentioned features as well as student and teacher interview guidelines. The accountable talk rubric considered differing dimensions of classroom talk: participation rate, teacher's linking ideas, students' linking ideas, teachers' asking for knowledge, students' providing knowledge, teachers' asking for rigorous thinking and students' contributions of rigorous thinking. Academic rigor was rated for text rigor, active use of knowledge was viewed through analyzing and interpreting during whole and small-group discussions and active use of knowledge was assessed during small group or individual tasks.

Teachers were observed during their 45 to 50-minute lessons in which three instructional

components were asked to be used for consistency: reading aloud, whole group discussion, and

after instruction directions of group work, group discussion or independent work. All lessons

were audiotaped, transcribed then coded. The accountable talk rubrics had three components:

accountability to the learning community accountability to accurate knowledge and

accountability to rigorous thinking.

The researchers calculated statistical correlations of the accountable talk to the rigor of the

lesson and discovered they had a positive and strong relationship. In addition, they found that the

mean average of the teachers talk was higher than the students talk. They also concluded that

students' active participation was a key determinant toward the rigor of the lesson, more so than

the teacher's talk. Yet, through a regression analyses, the teacher's talk was highly associated

with the student's talk. This suggested that the teacher plays an influential role toward generating

quality discussions through the types of questions they ask. Qualitative analyses of teacher and

student interaction also reflected the above finding of the critical nature of the teacher's

questioning. When continuous follow-up, probing-type questions were asked, it stimulated more

student elaborations. This implies the need for linking talk toward building a learning community

that promotes intelligence through social learning.

Findings also showed statistical correlations through rubrics and ratings of their IQA tool to

demonstrate how engaging, probing discussions are commensurate to the academic rigor of a

student's learning. What the researchers aimed to substantiate was that cognitive growth could

occur with discussion. Although descriptive statistics may not elaborate the types of social

interactions in which students were engaging, their findings opened the doors for less

cognitively-based research and more socially-based learning investigations. The use of

quantitative lesson transcripts could have been analyzed for differing patterns that occurred

within students' discussions and how they interact with the teacher to construct their knowledge.

While this may be statistically replicable, it is dismissive of the cultural nuances that can provide

instructional challenges for both teachers and students, particularly English language learners.

Instead of focusing on the tools for assessment, concentrating on the assessment of students'

interaction with teachers, peers and their construction of knowledge may be more beneficial.

As opposed to the prior discourse research strictly assessing on accountable talk and rigor,

Applebee, Langer, Nystrand, and Gamoran (2003) studied discussion-based approaches to

developing understanding and student performance in ability-tracked English classes.

Researchers examined the following: 1) interrelationships among variables that use dialogic

approaches for instruction, 2) relationships among variables and literacy performance in the

spring of the school year, and 3) interactions between the variables and grade level, school

context, level of performance and ethnicity. To do this, 974 students from 19 urban and suburban

middle and high schools from five large states with diverse populations were sampled, with

approximately one-third being ELL students. Grades studied included 7th and 8th in the middle

schools and 10th and 11th in the high schools. Four measures were used: a teacher questionnaire,

a student questionnaire, a program for analyzing classroom discussion developed by one of the

researchers, and measures of students' literacy performance. Teacher questionnaires asked about

classroom makeup, dialogic instruction (involving students in the exploration of ideas),

envisionment building (such as student being encouraged to engage in their own questioning,

responding to other students and purposeful conversation) and extended curricular conversations.

Student questionnaires inquired about background achievement and the amount of work that had

to be done for classes. The program, which analyzed classroom discussion focused on the types

of questions teachers and students asked, and their interactions with one another. Each class was observed four times, twice in both fall and spring.

Findings from the research, using hierarchical linear models, found that having high-academic demands while using discussion-based approaches resulted in significant relationships across a variety of ethnic groups and in both higher and lower-performing students. The approaches researchers point out that the one that contributed most to student performance were discussions that "develop comprehensive understanding, encouraging exploration and multiple perspectives rather than focusing on correct interpretations." At the same time, students who were in lower-track classrooms had fewer opportunities for interaction, extended curricular conversations, envisionment building activities and not provided as much academically challenging learning experiences. Further, the average number of minutes of open-discussion in a lower-track class was five times less than in a higher-track class.

In essence, there is a need for varied types of discussion in middle school classrooms. Applebee et al. (2003) suggest the need for "providing students with needed knowledge and strategies" in "moment-to-moment interactions" as they navigate new ideas with rigorous academic experiences. This reflects the learning scaffolds proposed by Wood et al. (1976) and theories of Vygotsky (1978) in relation to guiding students' through their zone of proximal development. What would have been additionally effective was analyzing the language itself between differing groups of students. Though there were minimal interactions in the lower-track classrooms, it would be beneficial to see the linguistic and cultural utterances between teachers and students. What if the same type of instructional guidance in relation to discussion that was implemented with success with higher-tracked classrooms was consistently used with lower-performing students? Providing instructional scaffolds in the form of questioning and discussion

is one of the foundations of this proposal's research design. It would provide the needed insight as to how to enable ELL students

 with the thinking and speaking tools needed to negotiate in a dialogic way and recognize culture as a component of learning.

Researching discussion through a different framework, Kucan and Beck (2003) explored two discourse environments with expository text and their effects on comprehension. Specifically, they pose the following study questions: 1) Is student comprehension of text ideas influenced by the discourse environment in which that text read and talked about? 2) Do different discourse environment promote different kinds of talking and thinking about text? and, 3) Does participation in a discourse environment have an impact of student thinking about text when they are no longer in the environment? There were 27 seventh grade students in the study, the majority being white. The students were chosen based on their teachers' feedback that they were competent readers and mature enough to engage and articulate ideas. The pretest and posttest was comprised of nonfiction tradebooks that were considered relevant, interesting and within a certain readability range in which they had to read aloud. Three open-ended questions were administered after reading a particular text. Questions ranged from comparing and contrasting, sequencing, inferencing, and interpreting in more than one portion of the text.

Four phases comprised the study: a preliminary phase, a pretest phase, an intervention phase and a posttest phase. In the preliminary phase, the goal was to solicit participants and give them a prior knowledge questionnaire so as to place them in the proper discussion group. The pretest and posttests were designed to ascertain if participating in the intervention influenced how they discussed texts and respond to various questions. The intervention phase's goal was to engage students in differing discourse environments, individual and small group. Over the three

intervention sessions, one time per week for three weeks, both groups would read to a predetermined place to respond to prompts from the researcher. The discourse environment was the participants, the purpose and the prompts. Both environments' goal was to support students' comprehension of ideas by talking while reading. Examples of questions during reading were: What do you understand so far? What is going on? Do you have anything to add or change? Group students who did not volunteer or were picked by the investigator could listen while another student explained. Individual students were asked to respond to initial prompt questions, and then asked to reread silently to reconsider their understanding.

These sessions were videotaped, audiotaped and transcribed for analysis and description. There were three types of student talk that was analyzed: personal, textual and intellectual. Personal talk referred to comments that students knew or didn't know something or about their own personal experiences related to text. During textual talk, students paraphrased and summarized with few details or with verbatim restatements of text. The intellectual student talk, to the researchers, seemed to be the point where students created understanding through creating interpretations via inferencing, questioning or making sense of ideas. The group also had a follow-up prompt if they had anything to revise, and those responses revealed four patterns: to add information, offer differing interpretations, refining or challenging initial responses and repeating information.

Pre- to posttest scores from the study revealed that all students improved on comprehension measures in both the individual and small-groups, suggesting that communicating understanding of textual ideas while constructing it supports comprehension regardless of others. This suggests the efficacy of exchanging and listening to various ideas from other students. At the same time, it is pointed out that students from the small groups not only were given lower-level questions

which restrained their ability to interact with each other, they did not have a chance to further explore the ideas they started discussing, potentially hampering their abilities to higher-order think about differing viewpoints, varied meanings of text, etc. However, follow-up prompts allowed for further discourse and elaboration and integration of ideas with students. The researchers concurred that promoting the discourse awareness of multiple perspectives and alternative ways of showing understanding of textual ideas through discussion need to be considered. Thus, group discussions provide greater opportunities for learning and give opportunities for more intellectual dialogic engagement.

As with previous studies, there is promise in providing multiple opportunities to engage in various forms of discourse, in this case dialogic conversations. The limiting factor of the study though seems to lie within the types of questions posed, and the lack of teacher interaction that could scaffold students to thinking about "how" and "why" questions. None of these types of questions were posed in the study, thus limiting the degree to which very high-order thinking could occur. The teacher is an interacting force within the learning conversation, specifically with those students who are struggling with information or how to express the information they have. Many ELL students struggle as such in other subject-specific disciplines with expository text and verbalizing their knowledge becomes more difficult when attempting to express higher-order concepts in a second language. This does not in any way suggest that English language learners or students in the study above do not have the ability. Moreover, it demonstrates the consistent need for scaffolded instruction, maintaining the academic rigor and use of academic vocabulary to guide these students to success.

The role of discourse with academic words is a critical part of developing any student's understanding. It provides another avenue to explore words aside from direct instruction,

textbook reading (and labs in science). Academic conversations are purposeful dialogues for developing higher-order thinkers. For English language learners, whose English language issues are more profound, it is essential to constructing both word knowledge and applying it in the academic context. Since different subject disciplines present challenges of difficult concepts and vocabulary, Alvermann (2000), as well as Stahl and Clark (1987) argue that point out that learning conversations would be of importance so students can "give and take" information and discuss meaningfully. This would enable students to use their language to synthesize complex ideas.

According to NAEP (2011), students who discuss more frequently score higher. Providing academic conversation opportunities to students to interact with difficult terms or concepts, allows them to explore and struggle to understand these words through rephrasing them, arguing with them, and "conceptually trying them out and verbally trying them on" (Cazden, 2001). Academic discourse will allow ELL students to negotiate their own comprehension and make them aware of the academic vocabulary they are using and build their linguistic lexicon while deepening their understanding of complex ideas.

Cognates and academic vocabulary in science

According to Graves (2000), science words are some of the "most difficult" since they have can have synonyms for words that students know at some level and can also have multiple meanings. This is one key reason why this I am choosing science as the subject of inquiry. An example of a discipline-specific word in science is "energy". The meaning can be much different than used in other contexts, such as in a typical everyday usage "I don't have the energy to work." Bravo, Heibert, and Pearson (2007) found that in an analysis of a science curriculum, 88% of words considered for instruction were Spanish-English cognates. Typically, in Science,

students learn academic words from listening to discussions and reading textbooks (Carlisle, Fleming & Gudbrandsen, 2000; Nagy, Herman, & Anderson, 1985). Many of these academic words are complex, tier three vocabulary words. Moreover, specialized words from discipline-specific areas such as science can appear as much as five times in a passage (Heibert & Cervetti, 2012). Thus, these vocabulary issues pose challenges to students understanding of not only the word itself, but of the related concepts. Not only does this have implications for learning vocabulary in science, this indicates substantial potential for cognate use in many other discipline-specific classrooms.

One notable, seminal study which focused on using cognates to facilitate academic vocabulary in science was conducted by Nagy, Garcia, Durgunoglu, and Hancin-Bhatt (1993). This study had a twofold purpose: to determine a transfer of lexical knowledge from students first language to reading in a second language; and to determine if this transfer is related to cognates. They examined 74 fourth through sixth grade students who were identified as "Spanish-English bilinguals". Researchers provided students with four different short expository science passages, in which they had to circle the cognates within the passages. They found that most of the students were able to recognize cognates in text. Further, it was emphasized there was in interaction between Spanish vocabulary knowledge and relationship to cognates. This supports propositions of Jimenez, Garcia and Pearson (1995), who had previously proposed that the more proficient ELL students were able to recognize and use cognates effectively. They point out that students need more knowledge and instruction in derivational morphology, and cognates could possibly contribute to vocabulary knowledge. Moreover, the Nagy, et al. (1993) indicated that there is a need for further study that examines the nature of the cognate relationships and how it can improve reading comprehension.

In a formative experiment conducted by Taboada and Rutherford (2011), the researchers sought how explicit instruction of content-specific academic vocabulary contributes in more, less, or equally as much as implicit vocabulary instruction to vocabulary and reading comprehension development of English language learners. Additionally, they also inquired whether specific teacher supports for reading motivation were perceived by ELL students and how they relate to their reading engagement. A formative experiment design investigates how instructional interventions can be modified or adapted to achieve their goal to facilitate fourth-grade ELL students'' academic vocabulary, comprehension and reading motivation in science. There were two interventions researchers developed to compare. One was intensive vocabulary instruction (IVI), the other contextual vocabulary instruction (CVI). These were implemented over an eight-week period for thirty-five minutes per day, five days a week. Twenty fourth-grade students were chosen, ten for each intervention group who were 90% Latino and ten percent other English language learners.

IVI was based within intentional, explicit vocabulary instruction of target academic words, using "rich language contexts" to develop word consciousness using multiple word exposures (Graves, 2006; Blachowicz & Fisher, 2006). Additionally, researchers also sought to teach students words in generative ways to unlock meanings using both word structures and words within context of reading (Blachowicz, Fisher, Ogle, & Watts-Taffe, 2006). They explicitly taught 104 target words over an eight-week period, averaging 13 words per week by using flash cards with a definition on one side and a visual on the other. This was done before and after reading. At the end of a lesson, a teacher would explicitly discuss a target word meaning. There were differing activities using the academic vocabulary words throughout the week, and games would be used at the end of each week to reinforce their understanding.

CVI was based within a reading engagement model, with focus on cognitive strategy instruction, conceptual development, and providing opportunities for student autonomy. Strategies included activating background knowledge, questioning, graphic organizers and monitoring for comprehension. These strategies were chosen based on positive prior results with English language learners (Jimenez, 1997; Proctor, Dalton & Grisham, 2007). The strategies were taught one every two weeks over eight weeks with modeling, scaffolding and independent practice. The practices to enhance motivation included choices of books, strategy choice, and a selection of subtopics to study. Academic vocabulary was taught implicitly, where students learned word meanings within explicit instruction while using context. As students encountered words, teachers would then provide the academic vocabulary instruction.

Quantitative data was gathered for academic vocabulary, reading comprehension, expository writing, student autonomy, and reading engagement. The qualitative data source was classroom observation. For academic vocabulary, both CVI and IVI showed positive results; however, CVI data was consistently lower, implying explicit instruction was more effective. Reading comprehension data indicated that there were gains for both groups, yet higher gains for the CVI group. The researchers attribute more gains with inferential types of questions with the CVI group. Rationale for this was the broader approach of engaging with academic vocabulary in various texts toward conceptual knowledge and a lack of strategy instruction. Results related to student autonomy showed positive student perceptions and greater reading engagement when provided types of learning choices. Observational data showed that the teacher was struggling with how to weave vocabulary instruction with the concepts she was teaching (in the CVI intervention). However, after implementing explicit academic vocabulary instruction and strategies within context, the teacher felt both worked well when using both and it helped the

flow of instruction. The researchers assert that there needs to be a balance of cognition and motivation for ELL learners to learn academic words and related concepts.

The results shed light toward seeking multiple instructional components to cognitively engage and motivate students. Within the study's premise, providing multiple opportunities to use words in differing contexts is one of the keys to the positive results. The other key to the positive result for both interventions was the use of explicit instruction of academic vocabulary. This was an essential part of instruction since it was the foundation for understanding concepts. At the same time, though, the researchers did not provide opportunities for students to engage in academic discussions. Even though this would have necessitated more of a qualitative approach, it could have provided further insight as to how the CVI group was able to infer. How did these students utilize academic vocabulary to extend their understanding of the concepts studied in comparison to the IVI? Could opportunities to use academic vocabulary in academic conversations be a scaffold for the IVI? The study, even though it considered motivation, had a strong cognitive focus. Although being effective and using variety of strategies, using more of a sociocultural lens would allow for teachers to guide students to choosing the right strategy to use in the CVI intervention. This would include guided instruction and would act as a natural scaffold for students. Additionally, with the IVI, it allowed students to cognitively construct in a sociolinguistic way to promote higher-order thinking.

Using both cognates and academic vocabulary as methods August, Branum-Martin, Cardenas-Hagan, and Francis (2009) examined the impact of an instructional intervention named Quality English and Science Teaching (QuEST), designed to develop science knowledge and academic language of middle grades ELL students who study science with English-proficient students. The researchers were interested in assessing the intervention's effectiveness on English

vocabulary development and science knowledge of English language learners and English proficient students. Study participants included 562 ELL students and 328 non-ELL sixth-grade students by ten teachers in five middle schools in forty different science classrooms. QuEST was comprised of two components: instructional materials and professional development (both of which were not available in the district at the time of the study). Instructional materials (using two differing science units) include a teacher guide, instructional charts, a student guide and instructional charts and supplies for hands-on activities. Professional development included three training sessions and continuous weekly mentoring.

The implementation of instructional materials used the Five "E" approach: engage, explore, explain, extend, evaluate. Aside from promoting interest to get students interested, engaging included modeling through demonstration or a stimulating question for discussion. The explore stage was a hands-on opportunity. In this stage, students listened to teacher explanations and discussed their observations, ideas and hypotheses, including posing questions. The extend stage applied concepts to new yet similar situations. The evaluation stage consisted of formal and informal assessment including reports, presentations and discussions. August et al. (2009) point out the importance of first building science language, along with accounting for language, culture of students and scaffolding science instruction (specifically through classroom discourse) for ELL students. Instructional scaffolds included graphic organizers, explicit instruction through modeling, and including visuals and cognates for building academic vocabulary. Over a nine-week period, the same teachers of the control groups also implemented the interventions and materials with two different instructional units. The professional development included outlining of the curriculum and activities, and on-going mentoring ensured that the curriculum was implemented with fidelity.

All study participants were assessed by two pre- and post- test measures- one for science knowledge taken from science tests from past state science tests, and vocabulary test that was researcher-developed. Overall, the QuEST intervention showed positive gains regardless of whether a student was an ELL student. All treatment students outperformed control students on both measures. Given effect sizes for both measures, the researchers estimate that students who received this type of instruction could make four years of gains in middle school compared to those with traditional instruction. Consistent with literature using on-going discussions, modeling and explicit vocabulary instruction, students' understanding of science content was enhanced by providing learning scaffolds.

The study takes into account the ELL students; learning needs, and uses a series of scaffolded practices allow all students to succeed. By providing ample opportunities to engage in the academic language, this enables the English language learner to further apply the science vocabulary in varied types of higher-level thinking applications. This results in producing strategic thinkers who can use discussion and cognates as their own tools to guide their learning. The theoretical perspective in the study reflects the cultural, linguistic and discourse needs, which are key components of sociocultural theory. Though the quantitative analyses are promising and favor instruction that incorporates some of the theoretical perspectives it espouses, there are a few questions that a quantitative design fail to address. What accounts for gains specifically for English language learners in comparison to native English speakers? Are they a combination of the instructional interventions or a few? One method of ascertaining this data is through the use of semi-structured interviews, which is part of this proposal's design. Also, how do different ELL students with differing language proficiencies apply different strategies? Are they becoming more metalinguistically aware of cognates as an intervention?

How much and what types of discussion are enabling their ability to use the vocabulary in differing scientific applications? Observing and analyzing the types of discussion provide windows into their growth over time. Nonetheless, it underscores the strong need to incorporate oral discourse into the science classroom in a variety of ways.

Even when considering the research related to academic vocabulary that has been presented, this has not necessarily translated to providing the type of pedagogy needed for many ELL students in various academic disciplines. Blachowicz, Fisher, Ogle and Watts-Taffe (2006), "revealed little change in classroom practice" (p. 524) in relation to instruction. Through their review of research on vocabulary, noted that "robust" strategy instruction such as the teaching of word structures and various other word-learning strategies may not be consistently present in the classroom. Students also need multiple exposures to academic vocabulary words in differing contexts. In terms of English language learners, they state that comprehensive with use of the native language, with support text and cognates, are powerful tools for increasing the vocabulary of ELL students. Students who do not qualify for specialized services, are not beginning readers, but are not yet fluent in the English language should be receiving differentiated instruction by teachers that utilize these students first language to enhance second language acquisition. Middle school ELL students, regardless of linguistic background (e.g. Spanish, Chinese, Hindi, etc.) require instructional support if they are to be successful readers in discipline-specific classes, no matter their level of English proficiency.

Teachers and researchers must continually be mindful that even with a wide array of vocabulary experiences, there still exists a gap between ELL student reading comprehension skills and those of their native English-speaking peers. This is especially evident when they read for information (Short & Fitzsimmons, 2007; NCES, 2007). Ogle (2010) cites the push toward a

balance of expository items within the NAEP framework stating there are about the same number of informational and literary passages at fourth grade; however, the percentage of informational passages at eighth grade is over 50%, and this accentuates a need for increased amounts of informational text. Since the majority of reading accomplished in subject-specific disciplines at the middle school levels requires students to read for information, the distance between ELL students' reading achievement and their non-English language learner peers has the potential to increase substantially. Additionally, students today are now expected to tackle even more complex text as mandated by the Common Core State Standards Initiative or CCSS (2014), which recommends a large shift toward informational text in middle and high school as well as a range of complex texts. The current shift toward informational text points to a need for instruction for classes such as science that have a large amount of academic vocabulary. Educators are now confronted with a new challenge for their ELLs in relation to vocabulary and comprehension with increased amounts of expository text at more difficult levels. These new textual demands brought forth by CCSS require a more differentiated approach toward instruction, specifically with ELL students. Since knowing content-specific vocabulary is essential to comprehending more complex informational text, the need to further provide learning scaffolds for middle school ELL students should be a research priority.

Since there will be a focus on more difficult expository text, adolescent ELL students need to develop their vocabulary to be successful in discipline-specific areas. In the report of the national literacy panel on language-minority children and youth, August et al. (2009) support instruction that is differentiated and explicit for these students. The possibilities of meeting the needs of this population must be met, as this can also become an issue of equity. The use of language in various forms is not only the means for transmitting knowledge of what is being

learned, but it empowers students to have more control over their own learning (Cazden, 2001).

The typical type of instruction delivered is still whole-class instruction (Blachowicz et. al. 2006),

despite students being more linguistically and culturally diverse. Embracing types of instruction

such as the use of cognates and providing multiple opportunities for academic discourse would

meet these needs in classrooms. When students have the appropriate tools for their specific

learning needs, they are not only more likely to use them, but more likely to be aware of when to

use them and use them more frequently as they experience academic success. With the

complexity of science vocabulary and scientific concepts, providing scaffolded learning

experiences for diverse English language learners is vital.

One such instructional learning tool that facilitates academic vocabulary and overall

academic language with ELL students is cognates. Heibert and Lubliner (2000) first started

examining words in academic texts and found that one-third of the words in academic texts are

Spanish-English cognates, and possessing knowledge of cognates assists reading comprehension

achievement. Several years later, Lubliner and Heibert (2011) again examined the number of

English-Spanish words using a specific academic word list across various subject disciplines.

Again, the researchers concluded that cognates are a "powerful tool" for ELL students' learning.

For this proposed study's population of middle school students within the subject of science,

cognates function as a beneficial instructional scaffold. Seventy-one percent of Science words,

the focus subject-area of this proposal, have Spanish cognates (Scott, et al., 2011). This suggests

that provided Spanish-speaking students can recognize an English word as a similar word in their

first language, the higher frequency of Spanish words that correspond to English academic

vocabulary words, providing them with a linguistic advantage for learning academic vocabulary.

With an extremely limited scope of using cognates in middle school instruction within different

discipline areas, this proposal incorporates them as a key part of the scaffolded-learning process in acquiring needed academic vocabulary to succeed in an academically rigorous subject.

The Nature of Questioning

The purpose of asking students questions is to facilitate student thinking and engage students in participation (Dillon, 1983). The amount of questions nor the rate at which they are asked are the focal points, according to Dillon (1983), but the "nature" of them. This allows students to construct their own explanations or predictions, and encourage them to elaborate on initial answers and ideas, and to help students "construct conceptual knowledge" which both "extends students' ideas and scaffolds" thinking." (Smith, Blakeslee, & Andersen, 1993). Within this study, questioning is a method employed to achieve these objectives in order to ascertain understanding through students' awareness of cognates, and applying academic vocabulary through academic discourse. Johnston (2012) espouses the notion of constructing "open questions" that allow for "multiple answers". Hence, not only are students' responses important, but these responses to teachers' questions should allow for discussions to construct deeper understanding.

Summary

The review of the literature related to vocabulary, comprehension, academic discourse, and cognates offers several important points for consideration. First, developing metalinguistic awareness as part of morphology instruction contributed to ELL students' vocabulary acquisition (Kieffer & Box, 2013; Kieffer & Lesaux, 2012; Kieffer & Leseaux, 2007; Carslisle, 2000, and Nagy et al., 1993). Second, intentional, explicit vocabulary instruction in conjunction with other word learning activities for English language learners promoted the attainment of tier two and tier three academic vocabulary (Taboada & Rutherford, 2011; Miller et al. 2010; Lesaux et al.

2010; Vaughn et al. 2009; Skobel, 1998). Third, cognates were found to be effective tool for ELL students toward acquiring academic vocabulary and promoting overall vocabulary development in English (Montelongo et al., 2011; Malabonga et al., 2008; Carlo et al., 2004; Hancin, Bhatt & Nagy, 1994; and Nagy et al., 1993). Fourth, academic discourse enabled higher-order thinking and deeper understanding of ideas and concepts (August et al., 2009; Wolf et al., 2005; Kucan & Beck, 2003; and Applebee et al. 2003)

Oral discourse, as Cazden (2001) emphasizes, empowers students to engage deeply in learning. It provides a voice and a mechanism to express their frustrations with learning, as well as their misunderstandings and understandings of what teachers expect them to know. Opportunities for discourse among students allow for engaging, purposeful daily learning. Being able to engage in discussion to think critically will not only improve an ELL students learning within the classroom, but will also equip them to discuss, debate, and negotiate in the real world.

Additionally, August, Shanahan, and Escamilla (2009) support instruction that is differentiated and explicitly adjusted to fit the needs of these students, which includes the use of cognates and oral discourse. The use of language in its various forms is the not only the means for transmitting knowledge of what is being learned, but it empowers students to have more control over their own learning (Cazden, 2001). It recognizes their cultural capital and provides the vehicle that allows them to utilize it. Shanahan and Beck (2006) and Carlo et al. (2004) suggest that English language learners who learn to read in English benefit from explicit teaching regardless of the language of instruction. Subject areas in middle school and high school possess very complex, conceptual academic terminology that requires direct instruction. These tier two and tier three words are part of every discipline-specific curriculum and appear frequently in various types of assessments. For ELL students, learning tier three vocabulary is even more of a

challenge, as they do not possess adequate background knowledge, can have conceptual misunderstandings, and may not possess the adequate vocabulary to build understandings of these words. However, since a vast number of the academic vocabulary words within Science share semantic and structural similarities, it would be extremely beneficial for ELL students that teachers to use an explicit strategy to teach these words. Marzano and Pickering (2006) outline a process in which students not only have instruction of tier three words, but the means to both visually represent and provide opportunity for academic discourse.

Further, the literature has shown that when English language learners show metalinguistic awareness of using their first language to construct meaning of a word, a phrase, a sentence or a larger concept, they are able to have greater academic success (Kieffer & Box, 2013; Kieffer & Lesaux, 2012; Kieffer & Leseaux, 2007; Carslisle, 2000, and Nagy et al., 1993). The need, then, is to provide cognate instruction to middle school ELL students. Further, middle school English Language Learners need to develop their academic vocabulary to be successful in various subject disciplines in reading and writing, August, Shanahan and Escamilla (2009) support instruction that is differentiated and explicit for these students. The possibilities of meeting the needs of this population must be met, as this also an issue of instructional equity. Utilizing instructional scaffolds such as cognates and academic discourse would be instrumental toward ELL students learning of academic vocabulary and constructing deeper understanding of science vocabulary.

Finally, this study can contribute to the field of reading in terms of exploring the role of cognates in academic vocabulary and discourse by utilizing qualitative methods rarely applied to similar studies. A qualitative approach can provide a unique insight into how English language learners construct higher-order thinking through the linguistic bridges of cognates and academic discourse. The focus on thinking and language can show how explicit cognate instruction and

academic discourse can develop both vocabulary and comprehension. Studies reviewed in this chapter demonstrate primarily numerical findings and do not account for how higher-order thinking is developed. Most of these studies focus on elementary ELL students; however, this study will investigate only middle school ELL students. A focus on this population of students investigates the thinking process of acquiring academic vocabulary and how academic discourse facilitates comprehension that can shed new light toward addressing their needs.

Chapter Three: Methodology

Introduction

Prior to any type of data collection, it is incumbent to have a methodology for a study: who am I going to study, what methods am I going to use to gather data, and what are the strategies I plan to use to analyze that data? When planning this study, I began with what I perceived as a carefully designed set of methods and procedures which I believed was a sound approach to ascertaining the types of data I needed to answer my initial research questions. Yet, as I indicated in Chapter One, a new question emerged that expanded the focus of my research. There are instances during the research process in which certain phenomena emerge that alters the context and how the researcher identifies with the phenomena. This again references how emergent design is a study design that allows for further inquiry within the course of a study (Lincoln et. al, 1994). These can shift the research, while still utilizing the same methods and still considering the initial questions. Such was the case in this study.

Conflicting assumptions about the roles of teacher/researcher impacted the implementation of the interventions during the study. This became apparent when I began to analyze my data. It contributed to the dearth and meaning of the study. One of my key data collection methods was to observe the classroom and ascertain how these students interacted in the Science classroom- with other students, to teacher instruction and through independent activities. During this time, I observed the case study students during their group and independent work. Mrs. Johnson asked students to "read the explanation" then "discuss what the problem is and write it on their lab sheet". "All case study students did not discuss". (Field notes, January 12, 2015). The next day, a similar behavior occurred, as, after the Mrs. Johnson "explained the procedure and modeled a lab to calculate average surface friction", she "directs

students to write the procedure" and to "talk to others" in their group. Again, "none of the case study students talk" (January 13, 2015). They then began to ask me for help as I was circulating around the room observing them. I responded to their questions, then returned to construct my observation notes. The students were aware I was observing them, as the class had been informed of my role that week was to just observe the classroom as part of my research.

This pattern continued into the following weeks of the study. As the research continued, a deepening rapport was developing with the students both as a reading teacher and as a teacher in the science classroom. It occurred to me that since I was delivering the academic vocabulary instruction with cognates, it became more difficult for me to remove myself to being perceived as a mere observer. I began to realize my roles were inextricably intertwined. This ran counter to some of my assumptions I had about my researcher role. However, since this was unexpected and unplanned, it created a series of circumstances which impacted how some of the research methods and procedures were implemented. The data I collected was affected, though I was unaware to what degree. I attempted to stay as true to the design as I could in this predominant teacher/participant role. Again, there was a diligent effort to maintain the integrity of the research process and implementation. Where I enacted a more traditional researcher role occurred during data analysis. This provided the needed distance to not only examine my students' learning, but my own role and actions, In essence, the analysis took on a new dimension. A new research question emerged which expanded my focus to engage in a close examination of my role as a teacher/researcher within the context of the study.

The purpose of this chapter then is to provide the methodology and procedures I adopted and implemented, including a focus on both cognates and oral discourse, in order to facilitate English language learners' academic vocabulary acquisition and comprehension of scientific

concepts. The findings based on the emergence of the new research focus are weaved within the

findings, in Chapter Four. The remainder of this chapter is now on the rationale underlying my

initial methodology, including selection criteria for participants and site, sources of data,

methods of their analysis, and phases of data collection and analysis.

The following are the research questions I initially considered for this study:

1. How do English language learners show awareness and apply knowledge of academic

vocabulary in science?

2. How do English language learners develop their understanding of science vocabulary

through the awareness of cognates?

3. How do they transfer cognates to other science vocabulary?

4. What is the relevancy, if any, of oral discourse to facilitating vocabulary acquisition

and conceptual understanding in science?

Emerging Question:

5. How did my different roles as a teacher and researcher impact how the study was

enacted and interpreted?

Theoretical Positioning of the Study

This study was conceived within the interpretive, or qualitative (used interchangeably)

inquiry tradition that focused on the "social meaning people attribute to their experiences,

circumstances, and situations, as well as the meanings that people embed into texts and other

objects" (Hesse-Biber & Leavy, 2011, p. 4). Qualitative research is an "interdisciplinary

landscape comprising diverse perspectives and practices for generating knowledge" and it

addresses a "vast range of possible research topics and questions" (Hesse-Biber & Leavy, 2011,

pp. 4-5). This diverse paradigm provides a seamless connection to qualitative research since the

qualitative methods that are used to gather data allow for flexibility to explore the learning

phenomena of English language learners by allowing the flexibility to dig deeper as new issues

arise or to gather further information as needed. This study was to investigate the context of a

typical science classroom, where instruction was focused upon the daily learning experiences of

selected ELL students.

Since the focus of the study was based within language and discourse, sociocultural

theory bore a special significance toward shaping the study's research purposes, questions, and

data gathering methods. As alluded to prior, Vygotsky (1978) asserted how language is key to

thinking and reasoning, and is critical to reading. He also stressed both environment and culture

as significant to learning. Therefore, it was a logical theory to apply to a science classroom with

ELL students.

Case Study

Case study was the most suitable methodological approach to this study since it presented

a real-life, contemporary, bounded setting (Creswell, 2013; Yin, 2009). Since I was the

researcher and a current teacher, it ensured a relevant application of a case study, since the

phenomenon being studied occurred within a real-life context where boundaries between the

phenomenon and its context were unclear (Yin, 1994). A "viable" case study is one with clearly

identifiable goals that seek to provide an in-depth understanding of a situation and/or problem

(Creswell, 2013). A case study is "preferred when examining contemporary events/phenomenon

where the boundaries between the phenomenon and context may not be clearly evident" (Yin &

Davis, 2007, p. 16). In other words, the use of a case study allowed me to explore any areas that

are unclear. For example, the design included procedures on the use of cognates to comprehend

texts; however, the inclusion of ELL students' oral discourse was integrated into the design to provide insight into their thinking relating to understanding the scientific content.

In a middle school setting, students tend to experience whole-class instruction within a bounded amount of time, with little variation for individual needs. One group for whom this is often not effective is English language learners, because of their limited knowledge of English in general, and in particular, their knowledge of science vocabulary. Teacher lecture is often a main mode of instruction, with explanation of academic vocabulary and related academic concepts being mainly delivered from teacher to students through oral lecture. Therefore, case study research that engages in a deep exploration of these phenomena (Yin, 2009) promotes a deeper understanding and further insights into the academic learning of second language learners. In particular, a systematic look into how students learn vocabulary provides a deeper understanding into how students benefit from explicit instruction focusing on cognates. This methodological approach was a comprehensive strategy of inquiry, since it used multiple data points and multiple sources of evidence (Yin, 2014; Creswell, 2013; Yin, 2009; Denzin & Lincoln, 2005) which was designed to provide various "windows" into ELL students learning within different settings.

Site and Participants

The selected school for this study was Johnson Middle School (pseudonym), a school located in a large school district in the Midwest. According to the state's website, the middle school consists of grades 7-8 with approximately 811 students: 59.3% Latino, 19.1% White, 10.2 % African-American, 10% Asian, and 1.3% either multiracial, Pacific Islander or American Indian. The school is considered a low-income, Title I school, as 71% of the school population are on free or reduced lunch. The entire school district is comprised of the following subgroups

of students: 50.4% Latino, 31.3% White, 8.5% Asian, 8.1% African American, and 3.9%

multiracial, Pacific Islander or American Indian. Students who are considered low-income in the

district are 60.9% in comparison to the 71% of low-income students at Johnson Middle School,

an 11.9 % difference.

According to the 2013 state testing where all testing was in English, reading performance

of Latino students reflected trends previously discussed; that is, scores similarly reflected poor

performance. For example, seventh grade students performed at 59% at or above grade level

while 55% of eighth grade students performed at or above grade level. When compared to White

students on the same test, 66% of seventh grade and 87% of eighth grade performed at or above

grade-level standards. On the science subtest, the 2014 seventh-grade test revealed a 44%

achievement gap between limited-English proficient students (designated as LEP) to White

students. At Johnson Middle School, 78% of White students met or exceeded grade-level

performance while only 59% of Latino students met or exceeded. This indicated Latino students

were performing 19% lower than White students, similar to significant performance gaps at the

state level. Therefore, there was a need for research to address this phenomenon.

In relation to 2014 state science test, administered only during the seventh-grade year,

there was a 14% performance gap between Latino and White students at Johnson Middle School,

and a 26% gap at the district level. These scores in both Reading and Science indicated issues

with both vocabulary and comprehension.

Having eight years of previous teaching experience with English language learners in this

school as a reading specialist, literacy coach and reading teacher have enabled me to observe

these students' continuous struggles with academic vocabulary and concepts in Science.

Research cited earlier indicated that both income and first language use-provides reasonable

explanations of these reading score differences. For example, Hart and Risley (1995) point to a vocabulary word gap, and note that the amount of words spoken in homes in relation to low-income, which revealed that impoverished homes had less language exposure than financially stable homes.

Many English language learners from Johnson Middle School speak Spanish as their primary language and are primarily from low-income families. These factors can significantly impact the amount of English words they are exposed to in their early literacy years, which can have a cumulative effect impacting later learning in middle school. In addition, typical class sizes in grades seven and eight include 30 or more students per class, limiting teachers' ability to work with groups of students who need differentiated instruction. In addition, the placement of students into particular science classes are also factors that can influence their learning. For example, from my experience, it is common practice to place students in science classes at Johnson Middle School on the basis of mathematics scores as part of determining a student's overall academic schedule. Thus, many ELL students who are perform well in Math and struggle in other reading-laden courses such as science, social studies and English, are often placed with students who have strong literacy skills. Discipline- specific teachers then typically teach predominantly using lecture and text geared to the higher-performing students, creating vocabulary and comprehension issues for English language learners. All of these issues mentioned: family income level, limited English language use, class sizes and placement- all important factors in their education, were not able to be changed.

To provide further insight into the context of the study at Johnson Middle School, it is important to note that the district implemented Marzano and Pickering's (2006) academic vocabulary instruction to improve vocabulary in academic areas since 2006. From previous

informal classroom observations at Johnson school, vocabulary in Science is learned four ways: through the implementation of the Marzano and Pickering's (2006) academic vocabulary instruction, through class readings, in-class assignments or homework, and through science labs. Academic vocabulary instruction is required at Johnson Middle School for every discipline-specific classroom, including rotational classes or "specials" such as art, physical education and Spanish. The district's goal was to increase the academic vocabulary knowledge for all learners in all subject areas; however, there has not yet been any assessment to determine the effectiveness of this approach. It was implemented to provide some insights into the Marzano and Pickering approach to improve academic vocabulary acquisition, yet no data has ever been collected by the district to determine the degree of its efficacy. Lastly, at Johnson Middle School, there was no existing model for teaching ELL students. For ELL students who attended Johnson Middle School, any type of academic support ended during the sixth-grade year, the last year of elementary school. Students identified as ELL do not lose that designation upon entering middle school, yet are placed in the regular classroom with no additional support.

Sampling Procedure

In selecting the participants, Creswell (2013), states that it should be individuals who are accessible, willing to provide information, and who may "shed light on a specific phenomenon" (p. 147). Additionally, Yin (2009) points out that, after choosing the participants, the researcher should gather additional information about each one, without doing a "mini case-study." Therefore, methodological choices consisted of criterion sampling and convenience sampling. Criterion sampling according to Creswell (2013) states that "all cases meet some criterion", which is "useful for quality assurance" (Miles & Huberman, 1994). For this study, the criterion used to determine the case(s) for research were student artifacts, such as class work, classroom

tests and district-based reading tests to determine which students were considered below average for their grade level. A convenience sampling consists of students that can be accessed in a certain geographic place (Miles & Huberman, 1994). This type of sampling provided more relevancy and pertinence to the selection of the case(s) in the study. A convenience sampling was chosen due to the time and schedule constraints of myself as a researcher and full-time teacher, the seventh and eighth grade student(s) who were selected, and the science teacher's instructional schedule. This type of sampling allowed for ample data to be collected despite the above boundaries.

Based on the above, a sampling of eighth grade ELL students were selected from a science class based upon criterion and convenience sampling within one classroom. The selected case study participants all met the "low-income" criteria, defined by the state as any student who receives free or reduced lunch. The actual number of students was dependent upon how many students met the selection criteria. Typical class size in Science classes at Johnson Middle school were about 30 students, with approximately 50% being English language learners. This ensured having a sufficient number of cases to gain a richer and deeper understanding. Selected students were identified by: 1) students' reading scores on local assessments, including Measures of Academic Progress (MAP); and, 2) student artifacts including formative and summative assessments. Formative and summative assessments were also considered as data to provide a further window into the current performance of possible participants. Given the factors related to Johnson Middle School, the following criteria were used to select case study participants:

- Students were enrolled in the eighth-grade Science class

- Spanish speakers were identified as an English language learner and no longer receiving additional support in English

- Students scored below-average in reading for their grade level on MAP (Measures of Academic Progress)

- Students designated as low-income, qualifying for free or reduced lunch

- Student artifacts

    o Formative classroom assessments such as in-class work and homework

    o Summative classroom assessments such as quizzes, tests or science lab mini-projects

Sources of Data and Strategies for Data Collection

A critical component to qualitative research is how a researcher investigates various phenomena that occur and the meanings that arise from them to acquire data. Within this research study, there were several strategies chosen as tools to collect deep, rich data. Data was gathered using beginning with a cognate pre- and post-identification assessment (Appendix A), along with methods including observational and reflective field notes, oral discourse with small-group guided discussion questions including academic vocabulary (Appendix B), focus group interviews (Appendix C), and individual interviews (Appendix D). Triangulation or multiple methods of data through careful examination strengthens the credibility of research findings (Creswell, 2014; Denzin & Lincoln, 2008, Hendricks, 2009).

Cognate-Circling Task

A cognate-circling task (Appendix A) was utilized to determine the ELL students' prior knowledge of cognates. This was a replicated task previously implemented in research by Nagy, et. al. (1993b). The first part of the assessment provided the case study students an explanation of cognates. Then, written instructions were provided which required the ELL students to circle all cognates found in the passage.

Observational and Reflective Field Notes

Along with interviews and focus groups, collecting observational data and writing field notes provide detailed and important information about how a research is being implemented (Denzin & Lincoln, 2005; Hendricks, 2009). Observations can be vital and are considered a key element in qualitative research (Stake, 2010; Hendricks, 2009). They assist in determining if an intervention that was implemented was successful and how the context of the setting contributes to it (Hendricks, 2009), as well as show how participants interact with others. This provides the researcher with additional responses and any notation of surprising occurrences. Additionally, observations inform the research by showing how attitudes toward the interventions and toward the subject change over time. Throughout the study, I both observed and constructed field notes on a daily basis. These were written immediately after observations, interviews, focus groups and interventions during each phase of the study. These notes assisted me in reflecting upon patterns and themes that emerged and served to capture some of my thoughts and perceptions after implementing the methods I used with the case study students.

Oral Discourse through Small Group Discussions. Providing ELL students multiple opportunities for academic oral discourse is a vehicle to engage and construct understanding of academic language. Brown (2007) postulates that "academic discourse is very challenging for ELL students because it is characterized with complex syntax, technical vocabulary, and a lack of helpful context" (p.32). Recognizing that science has its own unique language, English language learners need to have various opportunities to interact and clarify their understandings. This was accomplished by using language through oral discourse opportunities that allow ELL students to draw upon their linguistic capital. Theoretically, this is embedded in sociocultural theory, primarily Vygotsky (1978), who posited that language is the key component that

develops thinking and reasoning. Within the learning environment, the brain is constructing thinking and learning (Vygotsky, 1986). In other words, certain basic mental functions (such as memory) become more developed through environmental and cultural interactions and become internalized. Vygotsky (1978) further postulates that cultural context, along with use of language, allows for and promotes, higher-order thinking; since, according to Vygotsky (1978), the language within a culture helps to develop deeper thinking. So, providing ELL students multiple instructional opportunities to socially interact with academic vocabulary will assist in guiding their learning through their zone of proximal development.

Along with the sociocultural lens that is focused within language and culture to develop higher-order thinking, how a reader interacts with the type of text (words, phrases, sentences) plays a role in which they not only interact, but transact. Rosenblatt (1994, 2004, 2013) postulates that how a reader responds or "transacts" with a text depends upon the environment and context of that specific reading situation. Along with Vygotsky, she sees the influence of both the social and cultural elements as continuously complementary. Rosenblatt (1994) furthers the theory of Vygotsky by stating "conversation in which a speaker is explaining something to another person- can provide a simplified example of the transactional nature of all linguistic activities." (p. 1367). Both a speaker and one who is addressed within the context of a situation provide themselves clues, either aesthetically (a focus more on sensuous, affective, emotive or qualitative), efferently (a focus on more cognitive, factual, and referential), or both, in order to have a reciprocal exchange with text. This added to the idea that it is not just that language and culture are parts of learning, but within that framework lay a series of internal and/or external conversations for varying purposes. Based on this lens, providing referents and scaffolds assist the ELL student into accessing the cultural, linguistic and conceptual information to help guide

them through the use of oral discourse, so the meaning of the academic vocabulary words in Science are ascertained. This allows the reader (the participants in this case study) to think, transact and engage through oral discourse about science academic vocabulary in a broader context. These interactive, dialogic opportunities were provided within the context of small-group guided discussions, focus group interviews and individual interviews.

Thus, it is both the sociocultural and transactional lens which provided credibility for the use of oral discussions. As this study was framed within social and cultural lenses, the use of oral discourse was then used for data collection. Through explicit, culturally responsive teacher modeling of academic vocabulary with the integration of cognates along with teacher-guided oral discourse opportunities, participants are able to evidence of their awareness of cognates, develop their understanding of academic vocabulary in science, and apply these understandings to more complex concepts. Oral discourse through small-group discussions was a fundamental tool used for participants to transact with scientific academic language. All of the interactions and "transactions" were digitally recorded to assist in demonstrating the efficacy of this method.

Interviews

Interviews allow for detailed exploration of the experiences, motives and opinions of others to see the world from other perspectives other than our own (Rubin & Rubin, 2012). They provide a window into individuals' consciousness of complicated educational issues, which are considered "abstractions based on the concrete experience of people" (Seidman, 2006, p. 7). Moreover, since most learning takes place in a social context, it was appropriate to explore these social contexts both inside and outside the classroom. This provided a more complete picture of those thoughts and behaviors of students as they are learning, rather than mere "tangible performance items" students generate in class. These experiences "constitute the data" within the

"realities of life socially constructed through culture mediated by language" (Josselson, 2013, p 6).

  Individual semi-structured interviews. Interviews play a key role in qualitative research (Creswell, 2013; Yin, 2009), and are important for a number of reasons. First, they allow students to access and respond within their own "language" to describe and illustrate their thinking and learning. Additionally, it allows students to share in their own voices and words as to what was effective for them and why. Delving into the thought processes of ELL students shed light upon the use of their language background as they were demonstrating their understanding of sciences academic vocabulary and scientific concepts. An appropriate method to gain some of this data was through a semi-structured interview.

  Kvale and Brinkmann (2009) and Creswell (2013) suggest the use of a protocol guide to have the researcher write in allocated spaces underneath questions. One of the advantages of this is that it promotes remaining on-topic and not diverting too far from the interview questions. The protocol guide allows the researcher flexibility to ask questions for further clarification or to ask a student to expand upon an answer to a question to ascertain more rich data (Hendricks, 2009). Both the focus group interview guide (Appendix C) and individual student interview guide (Appendix D) were constructed to provide clear direction for interviews. This flexibility of interviewing is termed by Rubin and Rubin (2012) as "responsive" interviewing. Further, retrospective field notes were taken soon after interviews with additional reflections and insights Thus, I prepared the topics along with a limited number of questions in advance, and allowed myself the opportunity to follow-up students' responses with additional questions.

  An interview was conducted with the Science teacher to provide me a lens into how Mrs. Johnson viewed the role of academic vocabulary and how she integrated it into her classroom

instruction. The science teacher, Mrs. Johnson (pseudonym), was a teacher in my school, who is also Nationally Board Certified. She was also a colleague with whom I had both a good collegial relationship and friendship. She agreed to participate and allow the use of her classroom for the entire duration of the study. Thus, due to Mrs. Johnson's instructional expertise, our collegial relationship and her willingness to open the doors of her classroom for this study, she was an appropriate teacher for this research.

The school district's continuing professional development focus was on academic vocabulary. While serving in multiple roles as literacy specialist, reading specialist and reading teacher, I provided on-going professional development to all teaching faculty at Johnson Middle School. Since this was a component of each teacher's instructional routine, it provided an impetus to determine the extent and efficacy of its implementation. The Marzano-Pickering model was to be implemented by the classroom teacher each time a new academic vocabulary term is introduced throughout any instructional unit. I modified the instructional model for the ELL case study students by implementing cognates as part of the procedures (see Appendix E).

Focus group interviews. With interviews consisting of small groups of participants, a researcher comes prepared with a limited number of questions (Rubin & Rubin, 2012). These are typically semi-structured questions, prepared in advance with a focus on dialogue between students rather than on the results (Barbour, 2007). One of its main purposes is to encourage talk among participants to garner their attitudes and perceptions. (Barbour & Kitzinger, 1999; Vaughn, Schumm, & Sinagub, 1996).

A difference between the individual interview and a focus group interview is that I am able ask the group to come to a conclusion or consensus about the question (Rubin & Rubin, 2012). This included questioning, adding to, or responding to another student's comment. This

required their use of academic vocabulary and understanding of scientific concepts, as well as thinking about others ideas (a type of scaffold) to construct a response. In this research, the main focus with this type of interview was not necessarily to reach a consensus, but to gain a deeper understanding of how ELL students build meaning.

It is important while moderating a focus group discussion to consider parameters to best bring forth the strengths of this type of interactional exchange. Fontana and Frey (1998) guide the interviewer to not allow one individual to domineer a discussion, to encourage silent participants, obtain responses from every group member, and to allow for any emerging questions and interactions. Focus groups can provide deeper insight in how students interact with academic vocabulary. Through a series of semi-structured questions, I listened to students' responses in an attempt to determine the extent of their understanding and their perceptions about different tools and interventions used in the study. An advantage to this type of interview is participants may feel more inclined to share their thoughts within a group of peers than to participate in a one-on-one interview with a researcher (Barber, 2007; Kitzinger & Barbour, 1999). Therefore, I digitally recorded then transcribed all of the focus group discussions, which provided a rich data set from which to discern response patterns. A focus group, because of the nature of the "group" being questioned, allowed for expanded responses from the participants, providing the opportunity to build upon one another's explanations. The expectation was to provide non-threatening environment so that the English language learners can share their thought-processes about the various tools and interventions.

Data Collection Phases

Phase One. There were three phases of data collection in this study. The visual below represents an approximate timeline for each, as well as the data collected. In the first phase, I

began with an interview of the science teacher. Next, observational field notes were recorded during daily classroom instruction. I also recorded notes of the case-study students within this context. These were documented to assist me with identifying case studies, to provide specific, detailed notes to determine how students interacted in the classroom with the teacher, with other students, and on their own. Some potential questions that informed and guided the collection of data were:

- Do ELL students receive more than introductory instruction with academic vocabulary? If so, how?

- How is academic vocabulary embedded within instruction in science?

These guiding questions provided a purpose as to what to observe, and contributed valuable insight as to how the case study students were involved and integrated their own learning in the science classroom through oral discourse with their peers and with the classroom teacher.

Next, teacher-created formative and summative classroom assessments were collected from case study participants. Formative assessments (such as homework, classwork, and other in-class work) and summative assessments (such as quizzes, tests, and major projects) provided one lens into the ELL students' current levels of performance in the classroom and assisted in the selection of case study participants. Additionally, I created a specific cognate-circling task (Appendix A) which was given to case study participants to assess their metalinguistic awareness and knowledge of cognates. This assessment was replicated from a previous study (Nagy, et. al,1993. Based on the multiple criteria presented, case study participants were selected. Table One (below) reflects the outline for the first phase of the study.

Table 1. Phase One- Week One.

Monday	Tuesday	Wednesday	Thursday	Friday
Interview with the Science teacher			Cognate-circling task with case study participants	
Observations of classroom instruction Analyzing students' artifacts Participant selection		Observations of classroom instruction		Observations of classroom instruction

Phase Two. During phase two, data was collected using the following data collection

methods: cognate instruction, classroom observations of instruction using field notes and

retrospective field notes, small group academic oral discourse activity There were typically three

days of providing explicit academic vocabulary and cognate instruction activities and two days

of guided discussions. The first eight minutes of each period on Monday, Wednesday and Friday

were designated for the first three steps of the Marzano and Pickering (2006) academic

vocabulary instruction with cognates (Appendix E). The classroom teacher, throughout the

instructional quarter, was to implement other steps of the method. Marzano and Pickering's

technique, along with the cognate addition, was the vehicle used to improve ELL students'

acquisition of academic vocabulary words. This vocabulary strategy was part of a school-wide

imitative in which I provided initial and subsequent development for teachers during staff

meetings. In any case, it provided the classroom teacher an opportunity to observe a

differentiated strategy for ELL students in the classroom. While the teacher was not a focus in

this research, it was important to note whether she embedded similar instruction within their

practice or referenced cognates within instruction. This provided an opportunity to note how students in the case study were interacting with the academic vocabulary in daily classroom activities to determine any impact on academic vocabulary or comprehension of science concepts.

Two days per week I conducted small-group guided discussions (see Appendix B) to review what was learned from the prior day's lessons. These were designed to promote a deeper, conceptual discussion of the larger academic concepts that use the academic vocabulary being taught in the classroom. The discussion prompts were designed to allow the English language learners to access the cognates they learned to facilitate a connection between the Spanish word and the scientific term, thus enabling them to implement their cognate knowledge within a social context. This not only benefits ELL students' metalinguistic awareness, but allows them to associate cognates with academic vocabulary words. All discourse sessions were digitally recorded, for the purpose of listening and transcribing the interactions to determine the success of the interventions. Opportunities for discussion provide deeper insight as to how academic vocabulary is being acquired and promotes deeper understanding of scientific concepts. In addition, field notes were recorded immediately after observations of the science classroom, after the academic vocabulary lessons and after each small-group guided discussions (See Table 2 below).

Table 2. Phase Two- Weeks Two through Nine.

Monday	Tuesday	Wednesday	Thursday	Friday
Conducts academic vocabulary instruction with cognates	Conduct small group guided discussion with academic vocabulary	Conduct academic vocabulary instruction with cognates	Conduct small group guided discussion with academic vocabulary	Conduct academic vocabulary instruction with cognates
Observation of Science teacher's classroom instruction		Observation of Science teacher's classroom instruction		Observation of Science teacher's classroom instruction

Phase Three. As indicated previously, the main goal was to determine if students demonstrated progress with the use of cognates to access academic vocabulary and demonstrate understanding of science concepts during small-group guided discussions. With this in mind the major goal for interviewing in Phase Three was to hear each case study student's responses to determine if cognate instruction enabled them to apply and connect the complex scientific words to their first language. It was also similarly important to discern to what degree the ELL students were able to access that cognate knowledge in guiding them to discuss the larger scientific concepts. This data set is different from the first two phases since focus group and individual interviews empower students' voices as to how they process complex words and concepts when given various tools, such as cognates and discourse prompts, to describe their learning. It also provided perspective toward how they viewed cognates as a learning strategy. Table Three below details the different interviews that were conducted.

Table 3. Phase Three-Week Ten.

Monday	Tuesday	Wednesday	Thursday	Friday
Interview with the Science teacher Focus group interviews Case study participant interviews				

Data Analysis Strategies

This research intended to collect data that deeply delved into English language learner's thinking process of learning academic vocabulary through observations, activities and interviews. It is across all three phases that emerging ideas, themes, or examples (Creswell, 2013; Rubin & Rubin, 2012) became poignant and relevant to the research questions. Looking for threads that cross over from the research questions to the types of data collected was critical, since they revealed various patterns. Stake (1995) calls these assertions and Yin (2009) refers to building "patterns" or "explanations." Key sections of interviews and observations were used that support these assertions.

Yin (2014, 2009), along with Miles and Huberman (1994), point out the critical nature to constructing an "analytic strategy" to "display" data. This was accomplished through a series of charts or other visual organizers to demonstrate certain patterns within the different types of interviews after "putting around certain arrays" (Yin, 2014). This step was imperative since there were immense amounts of data. Engaging in this process enabled me to catalogue the data for deeper analysis for any patterns and threads that were found.

Whatever these threads of meaning shed toward the research questions, it was important that I reflected back to the key literature and research questions to determine the extent of any connections that existed between the data and the review of research in Chapter Two. It was also incumbent upon me to think "beyond the codes and themes" to focus on the "larger meanings" (Creswell, 2013). Considering how various pieces of data fit together with the reflective piece in mind guided my process toward drawing conclusions and making assertions about data that related back to the research questions. Inevitably, though, it was critical as a researcher to maintain a clear focus on the data to lead me in drawing common threads. To guide me through the course of data analysis, I was oriented by the following questions:

- What patterns and common themes emerge in responses dealing with specific items? How do these patterns (or lack thereof) help to illuminate the broader study question(s)?

- Are there any deviations from these patterns? If yes, are there any factors that might explain them?

- What interesting stories emerge from the responses? How can these stories help to illuminate the broader study question(s)?

- Do any of these patterns or findings suggest that additional data may need to be collected? Do any of the study questions need to be revised?

- Do the patterns that emerge corroborate the findings of any corresponding qualitative analyses that have been conducted? If not, what might explain these discrepancies?

It is important to note that due to volumes of data collected, I decided to analyze each phase.

Phase One. In this phase, the data collected consisted of the interview with the Science teacher, observation of classroom instruction and the gathering of student artifacts. During this

phase, there was an analysis of common themes and patterns between the initial teacher interview and the observation of instruction. The purpose was to gain insight as to why certain students may be having difficulty, even without cognates being an intervention. It is important to note that the teacher was not the focus of this research, and since the research changed direction midstream, I decided to not use the teacher interview, but focus upon my role with students.

Student artifacts were collected to gain insights of noting patterns in their work. This contributed toward the selection of the appropriate case study participants. I was unaware that some of the case study students did not have a collection or a portfolio of prior work, so I chose to focus on their summative and formative assessment scores and their course grade prior to the study. However, observing the classroom provided quite a bit of insight as to how ELL students were being taught academic vocabulary and the activities which included those words. More importantly, observing provided insight and how the English language learners interacted with the teacher and their peers within the whole class setting. Finally, the data collected during Phase One provided a window into the dynamics of the students' first language and their learning of academic vocabulary in science (See Table 4 below).

Table 4. Phase One Data Analysis

Research Question Addressed	Research Methods
How do students show awareness and apply knowledge of academic vocabulary in science?	Observation of classroom instruction Student artifacts Oral discourse using academic vocabulary Selection of students for case study Science Teacher Interview

Phase Two. In this phase, the focus of data analysis was focused upon: a) my role in pre-lesson instruction focusing on academic vocabulary using cognates; b) the observation of students in the broader context of the classroom under the direction of the classroom teacher; and c) small-group guided discussion questions. As previously indicated, it was during my actual data analysis that I recognized my emergent question. This occurred as I began to closely examine this phase of the study. I acknowledge that my conflict was not necessarily the roles themselves, but predominantly within my conceptualization of them. In any case, these data sets informed me about any potential connections among them. For example, data analyses were to determine the extent to which students use academic vocabulary after the instruction provided. These tools generated ample data toward how ELL students demonstrate awareness of academic vocabulary in science using cognates. Finally, Phase Two analyses explored how opportunities to discuss demonstrated negotiation of meaning and learning of both academic vocabulary and science concepts when provided guiding questions (See Table 5 below).

Table 5. Phase Two Data Analysis

Research Questions Addressed	Research Tools
1. How do students show awareness and apply knowledge of academic vocabulary in science? 2. How do students develop their understanding of science vocabulary? 3. How do students transfer cognates to other science vocabulary?	Pre-lesson academic vocabulary instruction with cognates Observation of Science teacher's instruction Oral discourse using academic vocabulary

Phase Three. In this phase of data collection, the data informed the research about the any impact of the cognate circling task to determine cognate awareness. The same test was used

to compare and analyze to the first cognate circling task. Second, individual interviews of case study participants were accomplished with the purpose of sharing their thought processes, which contributed toward a further understanding of how ELLs develop and transfer academic vocabulary. Finally, focus group interviews were completed with the case study participants to determine if they were incorporating cognates to ascertain academic vocabulary and comprehend science concepts.

Table 6. Phase Three Data Analysis

Research Questions Addressed	Research Tools
1. How do students show awareness and apply knowledge of academic vocabulary in science?	Cognate circling task
	Individual Interviews
2. How do students develop their understanding of science vocabulary?	Focus group interviews
	Teacher interview
3. How do students transfer cognates to other science vocabulary?	Oral discourse using academic vocabulary

Summary

The purpose of this study was to investigate how the use of cognates and oral discourse facilitate native Spanish-speaking ELL students' disciplinary literacy with academic vocabulary in science and enhance their understanding of scientific concepts. One significant purpose for this research was to consider an alternative approach in an educational setting for English language learners where they are engaged and responsive when learning science concepts. By creating specific opportunities tailored to promote their learning, this design provided me with an "embedded lens" in which to observe these students' learning. The interviews were to provide ELL students opportunities to share their thought processes toward how they believed cognates, academic vocabulary instruction and discussions were of benefit. This inquiry was designed to

collect rich data for the purpose of drawing conclusions, determining various patterns, and developing a broad understanding of the phenomena with English language learners in relation to academic vocabulary and discourse in Science. This investigation was conducted to open the various windows examining how ELLs construct understanding through academic vocabulary and language discourse. Yet, within qualitative research, any question, process, or phase of research can shift (Creswell, 2007). An additional question would emerge, and this provided an additional lens which would lead deeper insight into differing phenomena that occurred during the course of my research.

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Chapter Four: Findings

The purpose of this study was to examine how cognates, academic vocabulary instruction and small group discussions impact the comprehension of vocabulary and concepts on middle school ELL students in science. Through this research, I sought to answer the following questions:

1) How do English language learners show awareness and apply knowledge of academic vocabulary in science?

2) How do English language learners develop their understanding of science vocabulary through the awareness of cognates?

3) How do English language learners transfer cognates to other science vocabulary?

4) What is the relevancy, if any, of oral discourse to facilitating vocabulary acquisition and conceptual understanding in science?

Emergent Question:

5. How did my differing roles as a teacher and researcher impact how the study was enacted and interpreted?

This chapter begins with a general description of procedures and guidelines within the framework and design of the ten-week study. First, I provide a context of the three phases of the study. Next, I present and discuss findings for each phase which address the initial research questions. Third, I share what was learned about pedagogy based upon the data and findings. The chapter concludes with what was gleaned about designing and conducting qualitative research. Additionally, there is a need to note that throughout this chapter I also address my emergent question. This is woven into the various phases and descriptions of findings.

Data Collection Phases and Findings

This research was accomplished in three phases using a variety of methods and instruments (see Table 4.1 below). During Phase one, I selected four case study students and assessed their cognate knowledge. In Phase two, I taught targeted science cognates within academic vocabulary instruction and conducted guided small-group discussions. During phase three, I re-assessed case study student knowledge of cognates, along with conducting focus group and individual interviews.

Using Creswell (2003) as a guide, I transcribed all small-group guided discussions as well as focus group interviews, individual interviews, field notes and retrospective field notes taken throughout the study. Next, I segmented and coded these data into categories, then grouped together similar findings and labeled each. Coding in this manner permitted me to construct a description, or detailed explanation of the varied discourses between myself and ELL case study students. From these descriptions emerged a few key themes which occurred across all the cases. These themes became my major findings, or what Creswell calls "the lessons learned" (Creswell, p. 194). These themes also address the initial and emergent research questions.

My data analysis process began with examining field notes and retrospective field notes to "flag items of possible importance" (Wolcott, p.14 Transforming Qualitative Data). The following section will present findings during the first phase of the study.

Table 4.1: Data Collection Phases

Phase	Weeks	Data
Phase One	Week One (1-week total)	Gathered baseline data to select case study students; Conducted cognate circling pre-assessment
Phase Two	Weeks Two-Nine (Over 8-week time span)	Provided cognate instruction via academic vocabulary to whole class; Conducted small-group guided discussions
Phase Three	Week Ten (1-week total)	Gathered post-intervention data; Administered cognate circling post-assessment; Conducted focus group interviews and individual interviews

Cognate Pre-Assessment and Post-Assessment

Phase one took place throughout the first week of the study, focused on administering cognate pre-assessment with the identified ELL case study students in order to gather baseline data. I identified four eighth-grade students: Delia, Diego, Ivan and Leticia, all of whom met the criteria of my design previously discussed in chapter three, and introduced myself to them. I administered a pre-assessment, an expository science passage with eight science-related target cognates. I began by reading aloud the definition and explanation of cognates presented in the assessment. It should to be noted that reading aloud that portion of the assessment was not part of the procedures. This may have influenced some design integrity, which is discussed further in Chapter Five. Students were then directed to silent read and to circle any cognate they saw in the

passage. The same post-assessment was given during phase three and it is presented in Table 4.2 (below) alongside scores of the cognate pre- assessments. This addresses the following research questions:

    a) How do English language learners develop their understanding of science vocabulary through the awareness of cognates? and

    b) How do English language learners transfer cognates to other science vocabulary?

Table 4.2 Cognate Pre-Assessment and Post-Assessment Scores

Student	Pre-Assessment Score	Post-Assessment Score	Change
Delia	2 of 8 target cognates	4 of 8 target cognates	+2 target cognates
	14 non-target cognates	18 non-target cognates	+4 non-target cognates
Diego	2/8 target cognates	1/ 8 target cognates	-1 target cognates
	12 non-target cognates	13 non-target cognates	+1 non-target cognates
Ivan	3/8 target cognates	3/8 target cognates	0 target cognates
	21 non-target cognates	11 non-target cognates	-10 non-target cognates
Leticia	1/8 target cognates	5/8 target cognates	+4 target cognates
	6 non-target cognates	24 non-target cognates	+18 non-target cognates

Findings from Table 4.2 indicate that of the four case study students, Leticia showed the strongest growth identifying four more target cognates in the post test than the pretest, and an additional 18 non-target cognates, while Delia identified two additional four non-target cognates. Ivan remained the same with target cognates while identifying ten less non-target cognates. Diego demonstrated a minimal gain identifying non-target cognates. Thus, three out of four case study students, or 75%, exhibited gains with non-target cognates. In sum, half of the case study students showed growth, while the other half demonstrated no growth or negative growth. The

collective performance of students was varied widely between genders. The findings indicate

that, by increases of 50% or more, both Leticia and Delia demonstrated marked gains with

determining academic vocabulary words with cognates. This implies that both girls demonstrated

increased cognate awareness as well as the ability to transfer cognates to other science

vocabulary that was not explicitly taught in the context of the classroom. At the same time,

Diego and Ivan did not demonstrate increased awareness, and performed the same or slightly

lower than the pre-assessment. That being said, when comparing the amount of other non-target

cognates from the pre-assessment to the post-assessment that case-study students identified

significantly more non-target cognates. The first administration 53 non-target cognates were

identified, while the post-assessment revealed 68, accounting for 15 additional non-target

cognates. This increase implies that the ELL students were able to utilize metalinguistic

awareness to identify cognates. The cognate pre- and post-assessment, though, was only one tool

utilized to determine effectiveness of cognates. The following section provides descriptions of

findings for Phase II through the examination of small-group discussions, individual interviews

and focus group interviews.

Cognates, Academic Vocabulary, and Small-Group Discussions

Each week, I followed a typical weekly structure of academic vocabulary instruction

including cognates along with small-group guided discussions, as shown below in Table 4.3.

Table 4.3 Academic Vocabulary Instruction and Small Group Discussion Schedule

Monday	Whole-class academic vocabulary instruction with cognates
Tuesday	Small-group guided discussion using academic vocabulary
Wednesday	Whole-class academic vocabulary instruction with cognates
Thursday	Small-group guided discussion using academic vocabulary
Friday	Whole-class academic vocabulary instruction with cognates

Cognate and Academic Vocabulary Instruction

As presented above**,** approximately two to three times per week at the beginning of class I explicitly taught academic vocabulary in a whole-class setting in science using the Marzano & Pickering (1997) model, but with my addition of Spanish cognates. A five to eight-minute mini-lesson uses a real-life metaphor to build on students' schema, then follow with an explicit definition and Spanish cognate of the academic vocabulary word or concept. This was followed by modeling semantic and syntactic relationships to Spanish. Students are then required to paraphrase the explicit definition and construct a visual representation using a template reflective of the academic vocabulary model.

After conducting a mini-lesson, my designed role was to observe and construct field notes of case study students in the classroom. Stake (1995) notes how "observations work the researcher toward a greater understanding of the case." As I observed the case study students in the daily context of their science classroom, I began to notice that often when these students were struggling, they did not ask for any additional help from the teacher. One such example occurred during an assignment in which students given "a packet to read" with "less scaffolding as before". Students were directed to answer questions on a previous lab and were told they "must finish" prior to starting the new lab (Field Notes, January 20, 2015). They often did not

engage in any form of participation either by raising their hands or with a partner or group with whom they were seated. Mrs. Johnson was "circulating and scaffolding by questions for various students who are asking questions. No ELL is doing this" (Field Notes, January 20, 2015). In a similar fashion, the teacher provided approximately ten minutes to "complete paperwork for their lab". Ivan did "not respond to the other group member who was asking questions about the lab they had done." (February 18, 2015). This appeared to be common behavior during their science labs, as they typically stood back to watch other students or be given roles such as a timekeeper or writing down a time or measurement given to them. It appeared to me they may have been demonstrating "learned helplessness". Dweck (1975) defines this phenomenon as "the learning or perception of independence between one's behavior and the presentation and/or withdrawal of aversive events." This occurred multiple times and appeared to influence how they may have viewed themselves as learners with lower self-efficacy toward learning and avoidance of more.

The next sections begin with a discussion of some contributing factors which impeded the collection of adequate relevant data related to: increasing case study students' use of academic vocabulary to establish metalinguistic awareness of cognates, demonstrating deeper conceptual understanding of science concepts, and developing the depth of their responses to questions asked in small-group guided discussions and interviews.

Small-Group Guided Discussions

During lunch on Tuesdays and Thursdays, the case study students and I met during our shared lunch time. We were not able meet during any other time since we were bound by schedule constraints. After eating our lunches together, I conducted the small-group discussions in my classroom, where I created questions to determine the extent of their understanding of the science concepts they were learning. The intended questions were designed to engage students in

real-life scenarios while guiding them to embed target academic vocabulary within their responses and address the research questions related to:

a) How English language learners show awareness and apply knowledge of academic vocabulary in science;

b) How English language learners develop their understanding of science vocabulary through the awareness of cognates;

c) The relevancy, if any, of oral discourse to facilitating vocabulary acquisition and conceptual understanding in science

This was designed to demonstrate that they are not only utilizing academic vocabulary reflective of cognate instruction, but it allowed students to discuss these terms on a conceptual level; but also, to discuss them in context. Through my analysis, presented in the following sections, though, findings were quite different than expected.

Student "Talk" and Teacher "Talk". One of the central methods that were utilized to determine student understanding of science concepts and application of cognates was small-group guided discussions. These discussions provided rich insight in determining their effectiveness toward both student understanding and, as a researcher, how my role affected findings. My actions as a researcher within the discussions proved to be significant within the context of how the case study students interacted and learned about science. Thorough data analysis of the discussions revealed themes revolving around student wait time, types of related teacher/researcher questioning, and types of teacher/researcher responses. Categories of findings are depicted and discussed throughout the following sections of this chapter.

As I sifted through the data, I noticed that there was much more of my engagement as a teacher/researcher than an observer. That is, I engaged in quite a bit more talk via questioning

and other feedback that was not designed. So, I chose to determine the amount of words I spoke to determine two points of data: the degree of my participation in comparison to the case study students, and any increase in student talk as a result of the small-group guided discussion as an intervention. I noticed when comparing the initial and final discussions, the amount of my participation in each discussion did not change. That is, the amount and percentage of words spoken continually reflected teacher/researcher dominance. I noticed from the first small-group discussion to the last small-group discussion that the total amount of words spoken as a teacher/researcher reflected approximately three to four times more in comparison to the case study students (see Table 4.4 below). During the first small-group discussion, the percentage of my words spoken amounted to 63% of the words to 37% of ELL student words spoken. The last small-group discussion reflected a larger gap, with 79% of my own words to 21% of the case-study students.

This was alarming to me both as a researcher and teacher to dominate a discussion to this degree. I had specifically planned for the ELL students to discuss more than myself about the academic vocabulary words and related questions to discuss science concepts. And, it was during discussion time that I had expected students to demonstrate metalinguistic awareness to access Spanish cognates so they would engage in deeper discussions. I began to realize that I may have been influencing students' responses and I began to question my role as a researcher and teacher. It was at this moment that the emergent question in my design came forth. How did my roles influence this study? At this point, I chose to seek out possible factors that may have influenced these phenomena.

Table 4.4 Overall Amount of Teacher Talk and Student Talk

	# of Words Spoken First Discussion January 13, 2015	# of Words Spoken Last Discussion March 05, 2015	Total Words Spoken	% of Words Spoken
Teacher/ Researcher	1115	1661	2776	73%
Case Study Students	409	352	761	27%

Wait-Time. As discussed previously, a main goal in this study was to not only promote

discussion between students and myself, but to engage ELL students in academic discourse. The

key intention was to determine how this intervention would both increase the amount of

discussion and increase the levels of their understanding beyond the literal level. I had crafted

questions which were designed to elicit academic discussion as well as engage the case study

students. I displayed three questions for the ELL students, and noticed "they seemed very

hesitant and a little confused", and at this point, "I wanted to get them engaged" (Field Notes,

January, 13, 2015). I construed this to be a need for assistance, so I began to interject often

during our small-group guided discussions. After thorough examination, I discovered that this

resulted in a significantly reduced wait-time provided for them to respond. Thus, the discussion

dynamic quickly shifted from the design of the discourse being student-centered to now being

primarily teacher-centered.

Evidence of questioning and wait-time issues began with the initial discussion on January

13, 2015. I had planned a series of questions in relation to the concept of friction to foster deeper

conceptual discussion. Below, in Excerpt 4.1, is an example of an interaction from the initial

small-group discussion where Ivan, Diego and Delia discussed a question related to friction.

What I discovered was the beginning of a continuing pattern which continued throughout the

duration of the study. Provided alongside the questions, in parentheses, is the number of seconds

I waited prior to each time I responded in the conversation. Case study students are abbreviated

as shown below:

Excerpt 4.1 Wait-Times from First Small-Group Discussion (January 13, 2015)

<div align="center">

T/R= Teacher/Researcher
D= Diego
L=Leticia
De=Delia
I-Ivan

</div>

*(wait time shown in seconds, showing time prior to teacher/researcher speaking)

T/R: Is that a good thing or a bad thing?
D: For hockey it's good, 'cause it makes you move around. (0)
T/R: And what else can you tell them?
I: Um. Hmm. (1)
T/R: So you said it helps you move around, the sliding friction. So, tell me how can friction be good and bad? (1) Think of one bad example.
I: (immediately responds) Cars can, cars can slide and crash. (1)
T/R: Can you guys help him explain that?
Di: Like if the friction's decreased, like you can fall. You can slide. (0)
T/R: What kind of friction would that be, that would decrease?
I (immediately responds): Sliding. (0)
T/R: What was that?
I: Sliding friction. (0)
T/R: Sliding, does that decrease the amount of friction, did you say?
I: Ice. (0)
T/R: Oh, ice, okay. All right, ice. So that would be sliding friction, okay, cool, all right. And that would be a good thing or a bad thing?
I: (immediately responds) Bad thing.
Di: Bad thing.
T/R: All right. All right. What would be a good thing? (0) What would be a good way that friction is good?
De: (immediately responds) When you walk, um, um, it makes you stop.
T/R: Okay. Are any of the words up there that you can use to talk about that?
Di: (immediately responds) Friction makes you get a good grip on the cement.

There were several notable observations during this first small-group discussion excerpt.

First, there was evidence of "wait time" issues. For the purposes of this research, wait–time is

described as the length of the pause a person takes before further talk by the same or a different

speaker (Altiere, M.A. and Duell, O.K., 1991). Rowe (1974) discusses "wait-time" as having two

distinct types. The first type, "wait-time 1" is the initial wait-time teacher waits for the first response and wait-time 2 is the time teacher waits for all of the class to respond to the same question. In this study, the "class" was considered the small group. Of the thirteen-total wait-times given after asking the case study students questions consisting of both types, the average wait time for the first discussion was .46 seconds, or approximately half of a second. This represented fifty-four percent, or the majority of my interactions. On only one occasion during this section of the discussion did I wait more than one second. This occurred when I asked Delia to "talk about what she said there about sliding friction". Though I did ask a question that required elaboration, I paused only for two seconds, then heard her utter "hmm". Even though she appeared to possibly be still thinking, I interjected with my next question, assuming Delia needed assistance. Leticia did not participate at all. Regardless, wait times were extremely limited, regardless of wait-time types and often did not occur.

Though there were several issues related to wait-time, at the end of the exchange in Excerpt 4.1 reveals some evidence of not only accessing academic vocabulary that possessed a cognate, but use of the word to discuss the science concept. As Diego responded "Friction gives you a good grip on the cement", he provided a real-life application of the scientific concept. This followed Delia's response about how friction can be a source that "makes you stop" while walking. Diego not only responds to Delia, but appears to co-construct meaning through his example in a clear and concise fashion.

In any case, since there were many instances of limited wait-time during the first discussion, I decided to compare this finding to the final discussion to determine if the amount of time would increase after several weeks. The research had been crafted to promote an increase in participation by the case study students by the end of the intervention and less questioning by

myself. This, however, did not occur. Excerpt 4.2 (below) displays an excerpt from the final

small-group guided discussion where case study students were questioned about the concept of

acceleration, in which they are provided a graph to tell a story using the data.

Table 4.2 Excerpt with Wait-Times from Last Small-Group Discussion (March 5, 2015)

<div align="center">

T/R= Teacher/Researcher
D= Diego
L=Leticia
De=Delia
I-Ivan

</div>

*(wait time shown in seconds, showing time prior to teacher/researcher speaking)

T/R: So start telling me about what's happening and try to think of those words, okay?
Diego: There's a little boy walking. He's- (0)
T/R: You help him out, you guys can jump in.
Ivan and Leticia (simultaneously): Accelerating. (0)
T/R: He's accelerating, okay. Okay, so he's accelerating, how do you know he's accelerating?
L: Cause he's going up.
De: Because the line is going up. (0)
T/R: Going up, okay, all right. All right, so he's accelerating, all right, and tell me about his speed right now that you see?
De: Constant speed. (0)
T/R: Why do you know it's constant?
I: Line is straight. (0)
T/R: Cause it's straight. Okay. Um, all right, so continue the story. You said there was a boy that was walking, where's he going? Where is he on his way to?
De, Di, L (immediately respond): Store.
T/R: He's on his way to the store or school, which one you want?
De, Di, L (immediately respond): School.
I: Store. (0)
T/R: All right, take it from there, you guys take it from there, what happens?
I: He came back, 'cause he forgot- (0)
T/R: Okay, well look, look where you're at right here.
De: He stopped. (0)
T/R: Okay, how do you know he stopped?
L: 'Cause it's point. (0)
T/R: 'Cause it stops at a point, right? All right, so now, what can you figure out so far?
L: His distance is 50. (0)
T/R: His distance is 50 what?
De and L (simultaneously): Meters. (0)
T/R: Okay, and his time is approximately?

L: Five. (0)
T/R: Five minutes, right. So, at this point, what is his speed? (0) How do you figure that out? (0) You guys tell me what you would do from there.
Di (immediately responds): You divide distance and time. (0)
T/R: Okay, so you have your calculator there. So- so far, the first part of his journey-
Di: His average speed for that is- (0)
T/R: For the first leg of his journey.
Di (immediately responds): Yeah, is 10 meters per second.

This final small-group discussion uncovered similar wait time patterns when compared to the first discussion (see Table 4.5 below), including other notable concerns. When looking closely at the last small-group discussion, I realized I had provided considerably less wait-time when comparing it to the initial discussion eight weeks earlier. In fact, there was little to no wait time given for students. Though they did respond with academic vocabulary words during this final discussion, I would typically either repeat or rephrase what was said, "five minutes, right?" or immediately ask a question which would lead to a literal answer such as "what can you figure out so far?". There were times in which I asked a question for elaboration, but did not provide any wait time before another question was asked. One example of this was asking "how do you know" types of questions, to which I was mostly provided with literal answers. Though this indicates literal responses, the ELL students were utilizing academic vocabulary words such as "accelerating" and "constant speed". A few minutes earlier in the discussion, I reviewed academic words with cognates which had been previously taught during academic vocabulary instruction. One of the words was acceleration. Though it was reviewed, both Ivan and Leticia did access a cognate. This demonstrated some cognate awareness. Constant speed was not reviewed and Delia answered an elaborative-type question with a literal response, but no additional wait-time was provided after her initial answer.

Nevertheless, wait-time continued to be an issue. Table 4.5 below indicates wait times were on average less than one-half second on average, that being .23 seconds including both

small-group discussions. These findings further illustrate that when considering wait times of both types (wait-time 1 and wait-time 2), providing the adequate amount of thinking time for these ELL students was not present. It is possible that, as I functioned in the participant/observer role, the teacher "role was much more present as the participant. I had already noted they were struggling students and needed guidance, I naturally shifted because my innate teacher persona wanted to ensure the ELL students experienced success. This, though, affected how much and the quality of their responses. This is examined further in the following section.

Table 4.5   *Average Wait Times for First and Last Small-Group Discussions*

Discussion and Date	# of Words Analyzed	Average Wait-Time After Teacher Question or Student Response (in seconds)
First Small-Group Discussion (January 13, 2015)	304	.46
Last Small-Group Discussion (March 5, 2015)	330	.00

Questioning

Aside from the amount of "teacher" talk, I sought to delve deeper into the types of questions to determine how it may have affected the quality of the case study students' responses. This was the most logical next step since the overwhelming majority of my interactions as researcher/teacher were questions. And, since my interactions were contributing to limit the amount and quality of the case study students' participation in these discussions, uncovering the type and quality of the questions would then allow me to gauge a richer understanding toward possible factors that could have been impeding the case study students' ability to access and implement their academic vocabulary to demonstrate comprehension. While

examining the first and last small-group discussions, there were several questioning patterns that began to emerge. The next sections detail the types of questions that were typically posed to the case-study students.

Limiting and Directing Questions. When starting both the first and last discussion, I began each discussion with the case study students by asking them to "talk about" their science concepts. Table 4.6 (below) shows the questions that were pre-planned prior to the small-group discussion that were displayed on the smartboard. All academic vocabulary used had cognates.

Table 4.6 Pre-Planned Small-Group Guided Discussion Questions for January 13, 2015

Discuss Together as a Group

1. How can friction be both good and bad?

   Use the words friction, static friction, sliding friction when discussing with others.

2. Would you slide further on a sidewalk, on the grass, or on a frozen lake? Why?

   Use the words friction, static friction, sliding friction when discussing with others.

3. What problems would most likely happen in a car engine that runs out of oil and the oil is not replaced?

    Use the words friction, static friction, sliding friction when discussing with others.

During the initial discussion, it should be noted that I changed the question and asked case study students to interact about how "it", referring indirectly to the concept of friction, was "good and bad". The final discussion on March 5, 2015, their initial question was to tell me "what you see happening here", referring indirectly to the concept of acceleration, with a given visual graph. Both initial questions were very indirect; that is, they were not worded clearly enough to guide students as to what they were to discuss. I expected them to engage and intersperse various related academic vocabulary words amongst each other, discussing the

concept in context without any guidance. When this did not occur as planned, I changed the

types of questions I posed. I added what I will refer hereto as "limiting questions"; that is, those

inquiries which were not specific and/or restrict a student's response. I found that these were not

simply limited to the beginnings of the discussions but they were interspersed at various times.

The "limiting" questions often used vague, non-specific wording. Below, Excerpt 4.3

illustrates a series of "limiting" questions posed which did not provide clear expectations for

discussion:

Excerpt 4.3 Excerpt from First Small-Group Discussion with Limiting Questions

> T/R: Talk about what you know about it and how it's good and bad.
>   De: Friction is good cause, such as when you walk, like when you stop, it's
> friction. (1)
> T/R: Keep using those words from the question, okay, and try to use those words when
> you talk about it, okay?
> De: (immediately responds) It's also good, because it's, um, sliding friction, it's for
> hockey. Like when the ball like, hockey goes around. (0)
> T/R: What do you guys think about what she said? (0) Talk about what she said there
> about sliding friction.
> D: Hmm. (2)
> T/R: Is that a good thing or a bad thing?

Asking how "it" (referring to friction) was "good" and "bad", and to "talk about" without

providing a specific context may have been confusing to students. I then pointed to the academic

vocabulary words, directing them to "keep using the words from the question", possibly causing

further misunderstanding of what was being asked. Essentially, I had been telling them to "use

those words when you talk about it" without any guideline. After Delia responded both times

talking about friction, I asked the other ELL students to "tell me what you think". Though my

intent was to construct the questions that utilized academic terms, it was not proving to be

effective. The next question was limiting to Diego as well, "telling" him to "talk about what she

said there" about her response. Both questions posed lacked clarity since it did not specify as to

what I wanted them to discuss further. Their lack of response was evident as only Diego replied

"hmm", indicating he was thinking about the question. Not only did I not provide enough time

for the student to respond, I appeared to shift and abandon both the direction and sequence of my

pre-planned questions toward a question that provided for a very restricted response. This

"limiting" question pattern continued through the last small-group discussion and was just as

evident. In the following excerpt (see Excerpt 4.4 below), I again begin with a limiting question:

Excerpt 4.4 Last Small-Group Discussion with Limiting Questions (March 5, 2015)

> T/R: You don't even need your calculator for this right now, I just want you to tell me what happened (providing students with a visual graph). (Diego immediately responds)
> Diego: I want to find the speed.
> T/R: Oh, you want to find the speed? All right. So, as we do things, um, why don't we start telling the story, okay? So, start telling me about what's happening and try to think of those words, okay?
> Diego (immediately responds): There's a little boy walking. He's-
> T/R: You help him out, you guys can jump in.
> Ivan and Leticia (immediately respond): Accelerating.

This example, along with Excerpts 4.3 and 4.4, begin the discussion with ambiguous

phrasing, this variation being "tell me what happened". I repeat the request two more times, but

differ slightly each way I ask the same question. First, I inquire "what happened", then following

by asking them to "start telling me" while trying to "think of those words", referring to academic

vocabulary words that were written on the graph for them. Based on the manner of these

questions, I termed them "directing questions" as they "command" the students to respond.

These question stems: "talk about", "use", "help him out" or "tell me" lacked both specificity

and direction for student response. However, it should be noted that Ivan and Leticia did

respond with a science cognate word with "accelerating".

With the continuing use of limiting questions, there remained little clarity in direction to

which academic vocabulary words the English language learners were to use and be discussed.

When I did provide further direction, I used a common English colloquialism when "asking" them to "jump in" – which may have confused the ELL case study students. Since they were another common type of question, I examined the frequency and noticed that they were asked three times as much from the initial small-group discussion (see Table 4.7 below). Both limiting and directing questions were two common types of questions often posed in the small-group discussions that also affected the quality and depth of responses.

Table 4.7 Frequency of "Directing" Questions from First to Last Small-Group Discussion

Directing Question Stems	Frequency (January 13, 2015)	Frequency (March 5, 2015)
Use…	5	2
Talk/Tell/Share/Think of…	7	19

Literal and Affirming Questions. When examining further the types of limiting questions, I discovered an additional questioning pattern. I noticed an inordinate number of literal prompts, a series of question stems that restrict thinking to a simplistic, "surface level" response. These questions often began with "what" or "when", necessitating only a simple one-word or definition-type response. Literal questions require simple recall of factual information where students only need to list, state, repeat, or name answers. These were the most common and prevalent type of question asked in all of the small-group, focus group interviews and individual interviews combined.

When I examined the first discussion to determine how I was posing the discussion questions to uncover reasons as to why the deep responses I sought were not realized, I began to uncover literal question-stem patterns (see Table 4.8 below). This drove me to further find the

types and frequencies of these question-stem patterns in both the initial (January 13, 2015) and

final discussion (March 5, 2015) to determine if this was a consistent pattern over time.

Table 4.8 Literal Question Stems and Frequencies for January 13, 2015 and March 5, 2015

Literal Question Stems	Frequency (January 13, 2015)	Frequency (March 05, 2015)
What or where is/are/was…	11	26
What kind…	3	1
What else/and with what…	2	2
What would/wouldn't…	4	2
What happens…	0	3
How far…	0	3

These literal question stems required minimal application of academic vocabulary and

limited the case study students from analyzing or synthesizing the related scientific concepts.

The most common were ones that acted to narrow their responses to identifying or listing one

word or one sentence definition responses. What I had believed were "scaffolding" questions

were more literal, and the response format which was designed to be more student-directed

became more teacher-directed. My questioning seemed to morph into a traditional IRE format of

Initiate, Respond, Evaluate (Cazden, 2001) with a series of mostly literal, fact-based questions.

The most common literal question began with "what" in all but one category. Moreover, "what

is/was/were" type of stems accounted for 37 of 59 literal questions which relegated short,

succinct responses. Though these types of questions were not planned as part of my research, I

often found myself quickly shifting into this format after asking the initial planned question. This

was a continuing phenomenon from the first small-group discussion into the final discussion.

Further question analyses from small-group guided discussions. After disseminating the various question types asked in small-group discussions, I further analyzed the entire first and last discussions to decipher any further remarkable patterns to shed additional light or confirm some of the patterns I found. When considering and collating all of the questions asked in both initial and final discussions, I found limiting type questions were the most prevalent overall. Literal questions represented 37% of 106 questions, approximately one-third. The second most frequent question type were "directing" questions, which represented 31% of overall questions. When combining both literal and directing questions, limiting-type questions accounted for 68% of all questions; basically, it accounted for more than two-thirds. This was significant since it represented a combination of lower-level factual type questions that appeared to lack both specificity and direction. Along with affirming questions and limited wait-times, it seemed to clearly hamper the ELL case study students' abilities to further express their academic vocabulary and conceptual knowledge.

Leading Questions and Leading Responses

Noticing that I was asking a plethora of literal questions, I decided to examine additional patterns of questions that may have limited the quality of students' responses. After further analysis, I noticed the use of what I will term hereto as "affirming" questions, which steered students to often respond affirmatively. These "leading" questions often began with words such as "Is", "Did", "Do you think" and "Were you". They appeared most often during individual student interviews and focus group interviews. The purpose of interviewing is to "not get a simple yes and no" answer, but more of a description or explanation (Stake, 1995). The majority of data collected, though, illustrate this exact phenomenon. During the focus group interview with all case study students, I had sought to understand if the differing interventions were having

a positive impact on their understanding of scientific academic vocabulary, and if they had a

deeper understanding of the concepts related to them. My goal was to engage them with

questions so they would respond with more detail. Excerpt 4.5 alludes to one excerpt of how I

"led" students to respond in an affirmative manner while discussing impact of cognates on their

academic vocabulary acquisition.

Excerpt 4.5 Leading Questions from Focus Group Discussion on March 10, 2015

(Comments in parentheses reflect types of interruptions before a student had finished talking or

not providing wait-time)

> T/R: Like when we first started, did using cognates when we first started help you learn the academic vocabulary? When we first started.
> Diego: Yeah.
> Delia: A little.
> T/R: Why do you say a little or yeah, can you tell me about that?
> Diego: 'Cause there was some words that, uh, cause… (Interrupted student)
> T/R: In the very beginning? Okay.
> Diego: Yeah. There were some words that we didn't really know in Spanish, and there was other words that we're using, like, recently.
> T/R: Okay. How about you guys? When you first started learning the cognates, when I first started doing it with the academic vocabulary, do you think it started helping you then?
> Delia: Yeah.
> Leticia: Yeah, kind of.
> Delia: Yeah.
> Leticia: Yeah, kind of.
> T/R: Yeah? What do you mean by kind of or yeah, what do you mean? Tell me, just tell me a little more, what do you mean? (No wait time between questions)
> Leticia: That the hard words, I didn't know them.
> Delia: Yeah.
> T/R: The hard words? Okay. Were you able to relate them to Spanish at all?
> Leticia: No.
> Delia: No.
> T/R: No? But it, but it just, then how can I ask this, how did the Spanish help you, then?
> Delia: Um. Cause it's like, um, um.
> Leticia: Finding like similar words for it.
> T/R: Okay, so it sounded like something in Spanish? Okay. But you weren't really, weren't really sure. Okay. Um, did those, at the very beginning, did it help you understand the meaning of words at all? At the very beginning when I gave you the cognates?

Diego: It kinda did help me, 'cause I knew some of the words.
T/R: So you knew some of them, and Delia, would you say you knew a lot? Did you guys, did you guys know a lot of the words when I first taught them, or…
Delia: Some of them.

As depicted in Excerpt 4.5, several leading question stems were used with students. I initially asked "did using cognates from the beginning help learn the academic vocabulary". This likely led students to respond "yes", affirming that academic vocabulary instruction had a positive impact. An additional example of this occurred as I had already asked the group if cognates were helping them with the "harder" academic vocabulary words, in which both Leticia and Delia responded "no". Though the two girls had already responded to the question, I continued to lead them by asking "how did the Spanish help you then?" This question necessitated an affirming answer and limited their feedback to only affirmative responses. As mentioned prior, since students knew me, now that we shared a positive rapport, they likely wanted to respond with the answers I anticipated to hear. Additionally, I also "answered" for students during the same exchange.

However, when initially asked about cognates, Diego shared that there were words that he "really didn't know in Spanish, and there were other words that we're using, like recently." This indicated that though there were words that were not taught within the framework of explicit academic vocabulary instruction, he was likely accessing his first language to assist with deciphering meaning of a word in English. Though, after Diego began to further elaborate on his response about how they helped him, I immediately shifted direction to ascertain the perceptions of other ELL students. I did appear though, prior to that response to "lead" him as I began my questioning by inquiring if cognates were helping "when we first started help you learn." This could clearly lead one to conclude I had guided his thinking, however unintentional it may have been. The above excerpt was a consistent pattern throughout the focus group interview and some

of the individual interviews. Though I attempted to ask for explanations, the English language

learners were limited in providing clarification as to how certain interventions assisted them.

Again, though, case study students were not given adequate wait-time to provide all possible

feedback before a follow-up question was asked. This again, seemed to be consistent with an

IRE sequence of questioning as found during the small-group guided discussions.

Chart 4.1 (below) illustrates the pattern found that, when literal, limiting or affirming

questions are asked, or when a teacher/researcher interrupts and wait-time is compromised, the

depth of responses is typically limited and inadequate.

Chart 4.1 Types of Teacher Questions and Actions That Create Limited Student Responses
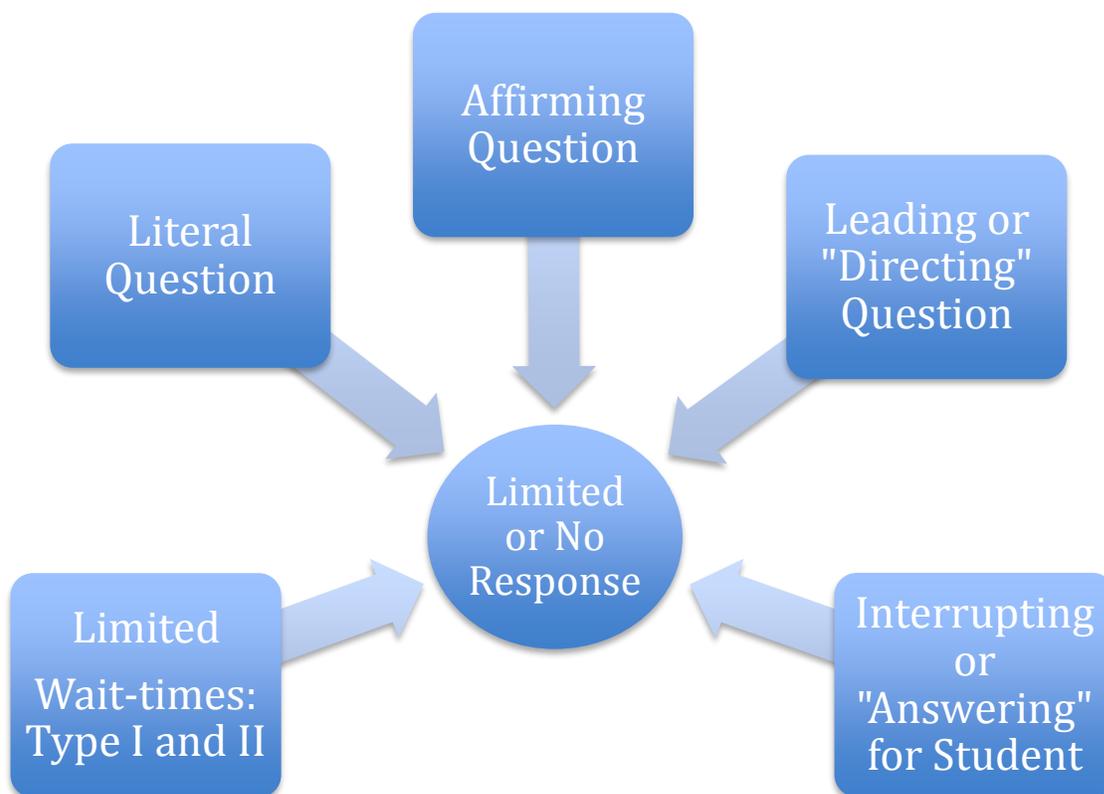
Responses Reflecting Increased Elaboration

Though there was a preponderance of literal and leading questions, limited wait-time, and interruptions of student-responses, there were occasions where I was able to ascertain more "elaborative data". That is, questions which delved further into case study student responses to either gauge the depth of comprehension of science concepts; or, during interviews, certain questions to elicit more about how they were using cognates, and if they were aiding or hindering learning. Typical follow-up questions were designed mainly to do the following: to build on another's comment, to provide an example, or to have them further explain or clarify a response. During the small-group guided discussion on friction, I asked many literal questions; yet there were occasions where I was able to ascertain more of their reasoning. Additionally, there were other examples during the individual and focus group interviews in which I was more successful in digging deeper. Excerpt 4.6 illustrates questioning that augmented deeper student elaboration:

Excerpt 4.6 –Questions Eliciting Deeper Student Elaboration Within Small-Group Discussion
(January 13, 2015)
(Comments in parentheses reflect case-study student actions)

T/R: How can tires be a good thing or bad thing with friction?
Diego: Because cars are big, and if they don't have like enough friction to stop them, then they can make a car crash- (Diego hesitates) and something bad could go on.

Delia: Shouldn't that be rolling friction?
T/R: Is that rolling friction, you guys? That's what Delia says. What do you think?
Ivan: On a car.
T/R: What was your example again, what did you say?
Diego: Um, a car could like, probably slip if it doesn't have enough friction
T/R: What slips with a car?
Diego: The wheels don't get grip.

In this excerpt, I asked how tires could be a good thing or a bad thing with friction. The use of the word "how" provided Diego the guidance to provide a further explanation. He

provided a cause-effect relationship relating to a car crash. Delia asked aloud if what Diego was

referring to was the academic vocabulary word of "rolling friction" which had been taught in

their mini-lesson with cognates. This time, instead of answering her in the IRE format, I asked

the case-study students what they thought of Delia's response. Ivan makes an attempt to answer

her; but since I, and possibly others may have been unclear as to what he meant, I asked Diego to

repeat his example for the group to reconsider. I then shifted back to the literal question pattern

again, as discussed prior, limiting the opportunities for Delia and Diego to clarify and/or

elaborate their ideas. Small-group discussions were not the only source of instances that included

examples of questions posed that promoted more "student-talk". As I was inquiring about the

effectiveness of the small-group discussions to understand science academic vocabulary and

related concepts, individual interviews allowed more time for case-study students' voices to be

heard. Below, in Excerpt 4.7, Leticia shares more information about how the small-group guided

discussions worked for her. This began questions which only pertained to discussions.

Excerpt 4.7 Questioning for Further Elaboration During Individual Interview of
Leticia About Small-Group Guided Discussions (March 10, 2015)

> T/R: How did you use- how did the discussions help you?

> Leticia: Like, it helped me to understand better and like not having trouble, like if the teacher calls me and says to give me the definition of this word, I would just say it 'cause I already know.

> T/R: Is there something about the discussion that we did, about discussions that help you? What is it about discussion that helps you?

> Leticia: Helps me to understand better.

> T/R: Why? What is it because of, you think?

> Leticia: Cause all the people there already know it. Or know something.

> T/R: Or they have something about it and-

Leticia (jumps in): Yeah.

In Excerpt 4.7, other question-types which allowed further elaboration included "how" questions similar to Excerpt One; however, I further inquired asking Leticia "what about discussion" specifically helped her to "understand better". Additionally, I followed with "why" to ascertain her thought process, and this may have resulted in the avoidance of affirmative or literal answers. Though she was still somewhat vague in her reply, she did state twice that it was aiding her comprehension. She also alluded to "all the people" in the group having knowledge which Leticia could be utilizing to construct a deeper understanding through listening with her ELL peers. As in Excerpt One, it should be noted that I shifted back to teacher-led "directing" through providing an answer for her that would be answered with an affirming response. Again, that being said, there was increased elaboration in the exchanges by Leticia, who typically did not reply with reasons or examples throughout the intervention.

In a similar focus on cognates with Diego in a third excerpt (Excerpt 4.8), I begin by asking him, he discusses how he utilizes cognates in science class to discern academic vocabulary:

Excerpt 4.8 - Questioning for Further Elaboration During Individual Interview of Diego About Using Cognates in Science Class (March 17, 2015)

(Teacher/researcher or student actions in parentheses)

T/R: Do u now, do you try to think of the Spanish word like during class now without working with me, are you now trying to think of cognates?
Diego: Like each time she has a new word and like it's not familiar, I try to like think about a Spanish word that sounds familiar to it.
T/R: And, okay.
Diego: It has to be related to like, science.
T/R: And how does that help you?
Diego: Like. (One second wait-time)
T/R: Or is it helping you, is it helping you?
Diego: It is helping. Like once she gives an example, most of it's kind of what I know.

T/R: So are you kinda like having a conversation like- (Diego jumps in)
Diego: In my mind.
T/R: With your mind?
Diego: Yeah.
T/R: What are you doing, what's that conversation like in your mind?
Diego: It's like, like I think about it and then like, I'm like, is it this one? And I have to think about it, if it's science-related or something, or what does it have to do with like, by the way, know it in Spanish, so then like when she gives an example, I'm like, yeah, I think it is. And then like, she gives a definition, I'm like really sure what it means.
T/R: Okay. But you're going, are you saying you're going back, I'm getting like, you're going back and forth between Spanish and English.
Diego: Yeah.

Though there were some similarities with this excerpt to the first two excerpts with an affirmative-leading question to begin, this sequence differed in that I was able to capture more of Diego's metacognitive process. He describes how that when a teacher gives an example, Diego typically is able to relate to his schema, pointing out how cognates are a tool when he references Mrs. Johnson, sharing "each time she has a new word, and like it's not familiar, I try to like think about a Spanish word that sounds familiar to it." As indicated previously, Diego is demonstrating metalinguistic awareness identifying the semantic and orthographic relationships of Spanish and English. At the same time, I appear to somewhat lead his thinking immediately after this by "directing" that he may be having a "conversation" in his mind, to he agrees. This was followed by inquiring or probing what that conversation would be like, which he details is how he seeks out syntactical or semantic similarities to his Spanish language schema. The question, though, was directed to inquire how he was determining word meaning, and did shed some light on his metacognitive process in regards to academic vocabulary and cognates. Chart 4.2 (below) depicts when "how" or "why" questions are asked and students are provided sufficient wait-time without teacher interruption, they elicit more in-depth elaborative responses with deeper reasoning.

Chart 4.2 Types of Teacher Questions and Actions Creating More In-Depth Student Responses
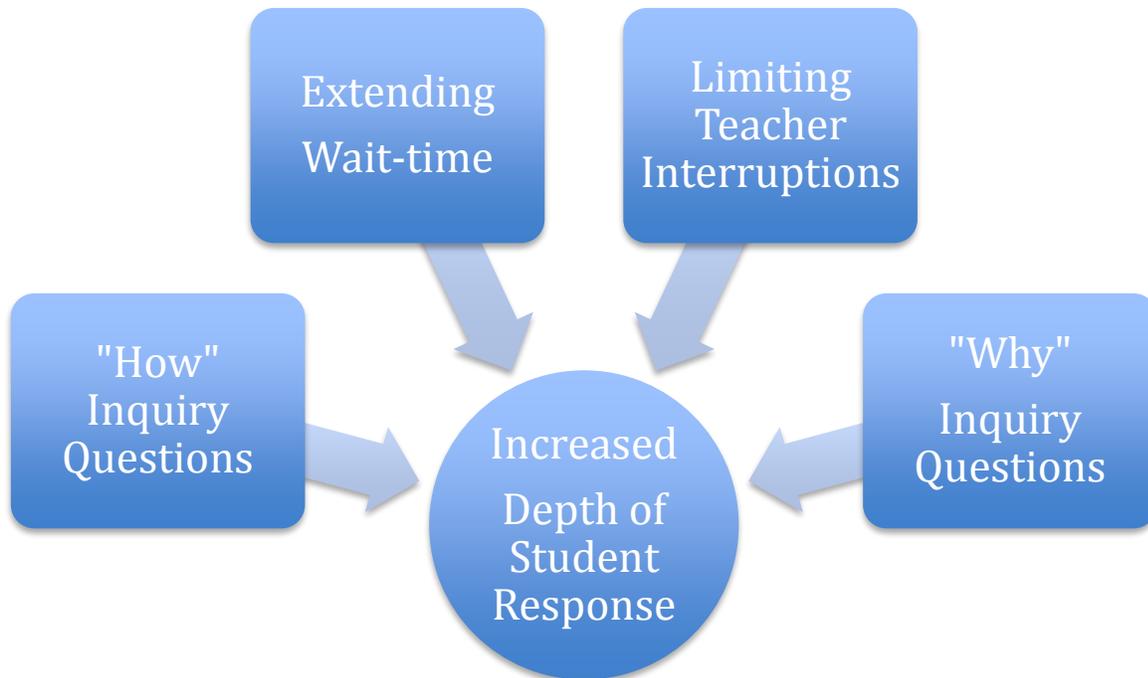
In sum, though the three excerpts shown above allowed for more detailed responses by Delia, Leticia, and Diego, these types of exchanges were not common in my questioning patterns. The questioning methods often used to "scaffold" throughout small-group discussions, focus group interviews and individual interviews created limitations within data elicited to answer the four key questions of my research. Literal questions, leading, affirming, and directing questions (as discussed prior), brief or no wait-times, and interrupting of students all created a series of concurrent limiting factors which significantly reduced the collection of rich data needed to ascertain patterns and themes that would provide sufficient, credible, and viable findings. However, when teacher questions and actions were less frequent and increases in thinking time were provided, case-study students were able to better delineate their ideas to show their understanding. These realizations and conclusions of issues with questioning and wait-time

created an impetus for me to look "inward" to how both pedagogy and research design affected the findings. This would provide a better window to understanding possible issues that may have been contributing factors.

Pedagogy and Practice

Since questioning and wait-time appeared to have demonstrated the greatest impact on the amount and quality of case study students' participation in both small-group discussions and various interviews conducted, it was necessary to examine how these practices reflected pedagogical research. As noted in previous sections of this chapter with visual depictions (Charts 4.1 and 4.2), various types of questions were asked that limited student responses. These included affirmative, directive or leading, and literal questions. Questioning has long been a pedagogical practice that is an essential part of teaching. Brophy & Good (2001) discuss the purpose of questions so a teacher can "monitor" student understanding and reflect about academic content, "connect" to their own schema and to "apply" their understandings to varying situations. I first decided to further examine the initial questions I prepared prior to small-group discussions that were displayed for them on the digital chalkboard (see Table 4.14). This was prior to modifying them and adding several additional questions during small-group guided discussions.

Table 4.14 Questions from Initial Small-Group Discussion (January 13, 2015)

<div align="center">DISCUSS TOGETHER AS A GROUP</div>

1. How can friction be good and bad?

   Use the words friction, static friction, sliding friction when discussing with others.

2. Would you slide further on a sidewalk, on the grass, or a frozen lake? Why?

   Use the words friction, static friction, sliding friction when discussing with others.

3. What problems would most likely happen in a car engine that runs out of oil and the oil is not replaced?

*Use the words friction, static friction, sliding friction when discussing with others.

Upon examination, these initial questions could have potentially allowed for case study students to actively apply the concept of friction through accessing academic vocabulary (with cognates), applying Mrs. Johnson's from class along with their schema. As previously noted, I often shifted into posing literal and directing questions (see Tables 4.3 and 4.6). One reason was due to my concern that the case study students "needed a bit of scaffolding" (Field notes, January 13, 2015). Similarly, during the final discussion I continued to echo a similar need stating, "I needed at one point to scaffold" (Field Notes, March 5, 2015). It appears I misapplied my understanding of scaffolding. As alluded to in chapter two, the purpose of scaffolding is to provide adult guidance when a student is experiencing a challenge until a student can experience success independently (Wood et.al, 1976). With Delia, Diego, Ivan and Leticia, my "scaffolding" intervention was to simply ask lower-level questions which limited their opportunity to further engage and express their ideas.

My questioning seemed to not guide, but evaluate for correct responses. Brophy & Good (2001) state the purpose of scaffolding should not be to elicit correct responses to literal questions, but to provide opportunity to "process the content actively and "make it their own". This would then "guide" students toward conceptual understanding." The pedagogical misstep was to use questions that limited their ability to rephrase or explain. This is not uncommon with the practice of many classroom teachers. Seminal research by Durkin (1978) found that extensive analysis of teachers' questions reflected a majority of fact-based questions designed for assessment but not for instruction. This aligns with the number of literal questions asked which

evaluated students' knowledge as opposed to foster or guide the case study students' discussion. Moreover, research on classroom discussions has found teacher questioning "foils discussion" when it results in a recitation of facts (Dillon 1979; Dillon 1988). The use of my questions, though conducted with the intention of providing further opportunities to deepen discussions, often had the opposite effect.

Further, when re-examining the sequence of questioning which led to many literal and affirming responses, there appeared to be minimal to no wait-time given for student thinking. This often resulted in IRE types of exchanges of Initiate, Response, Evaluation, as previously defined by Cazden (2001), which occurred in small-group discussions and both types of interviews conducted. This appears to be another pedagogical lapse. Seminal research by Rowe (1969a) that was later replicated by Swift & Gooding (1983), and Tobin (1986) all have indicated typical average wait time in classes after an initial question has been posed is less than three seconds and often less than one second. Wait-time I refers to the pause after the initial question has been asked. Wait-time II is the pause after a student response to a question (Rowe, 1974a; Rowe 1969a; Tobin, 1987). In my research, many of my wait-times (see Table 4.5 above) point to less than one second before I asked another question. Rowe (1974a) reported that when wait-times are greater than three seconds, there are more elaborative student responses (as measured in length), and an increase in student-to student interaction (Rowe, 1974a). Additionally, Tobin (1986) manipulated wait time to average between three to five seconds and found that there was an increase in the average length of student utterances. Essentially, students had more "think time" to consider their responses. Being aware that my interruptions of students likely impeded their "thinking time", I could have positively impacted the amount and depth of their participation by providing additional time after asking the initial questions.

Aside from providing wait-time to promote increased amount and depth of student participation in discussions, I looked further to determine how I could have promoted the quality of the case study students' engagement. One method that has proven effective is to allow students to respond to statements in place of questions. A case study of ten discussions conducted by Dillon (1981) found using a variety of "alternative" statements resulted in improvements. "Alternatives" are statements designed to promote further student elaboration about a topic or concept. These are provided after a question is asked and a student has finished speaking (Dillon 1979; Dillon, 1981; Dillon, 1984). Alternative statements allowed for more student to student references, more schema incorporated from outside the lesson, and more student-generated questions. In relation to my findings, this practice could have reduced the sizeable amount of teacher questions, thus restricting discussion. Table 4.15 (below) provides types of "alternative statements" to provide in place of questions to empower and engage students (Dillon, 1981):

Table 4.15   Types of Alternative Statements to Replace Questions (Dillon, 1981)

1. Make a declarative statement such as an opinion,

2. Make a reflective statement or a sense of what student has said

3. Describe their state of mind (such as "I'm not getting your point")

4. Invite the student to elaborate

5. Encourage a student to ask a question

6. Encourage other students to ask a question

7. Maintain deliberate, appreciative silence (until the student resumes or another enters the discussion)

In addition to alternative statements, van Zee and Minstrel (1997) also found positive outcomes when placing the thinking back upon the student in place of follow-up teacher questions. Each interaction by a teacher after a student response was termed as a "reflective toss". The sequence typically begins with the initiating teacher question, then a student response. However, rather than evaluate the response for correctness, this is followed by another teacher question (or statement), which would increase both the frequency and quality of student responses. Some reflective "toss" scaffolds included: clarifying student responses, engaging student in evaluating a proposed method, providing multiple opportunities for student judgment, engaging students in comparing, asking students to generate a context for an issue, and encouraging students to monitor other students' thinking (van Zee et. al, 1997). The focus is on the student's thought process in lieu of correctness. This pedagogical scaffold could have been effective in changing IRE types of sequences I often utilized to gain further student input, and would have placed more focus upon how they were constructing their ideas as opposed to ascertaining answers.

All of the pedagogical insights presented in this chapter were the result of seeking understanding for issues of limited participation and limited amounts of elaboration. Yet, as I continued to reflect pedagogically, I realized that my questioning did not reflect the necessary and adequate type of scaffolding for the ELL case study students. This was a necessary part of the instructional intervention within the discussion. It was more of a reflection toward how I had approached and applied my conceptual understanding of scaffolding as a teacher/researcher within the small-group discussion, focus group and individual interviews. As previously presented in Chapter Two, Wood, et. Al, (1976) discuss the "knowledgeable other" in the classroom, to which language is a utilized to "direct" and "connect" previous schema to a

concept. Additionally, the teacher is the mediator who models for students in a socially-constructed meaning-making activity (Gee, 2008). However, within the data gathering process, it appeared that I had misapplied how meaning-making through language was constructed through my questioning and feedback. Though I often integrated myself using oral language during the discussions in an attempt to increase both frequency and depth of participation, the intended outcomes were not achieved. For example, during the first small-group guided discussion, I noted that because case study students had issues with their ability to effectively engage and "express" their ideas. I presumed that they needed to have simpler (literal and/or affirmative) questions provided. Only then would I follow with "how" or "why" questions or have them "tell me more" (Retrospective Field Notes, January 13, 2015). I acknowledged that I may have "led them too much". This may be due to myself and other teachers who have not been adequately developed with English language learners' pedagogy; that is, we make the instructional decision when ELL students are struggling that they are not understanding. It likely led to the shift of asking predominantly literal questions. A barrier in language, not the ability to construct deeper understanding, was more the root of the issue. Though my intent was to both engage them as well as develop their responses, the shift to limiting questions remained a factor that influenced the outcome of findings. This demonstrated a misapplication of the scaffolding concept.

This misunderstanding of scaffolding occurred during a small-group discussion on thermal heat energy transfer. I noted after the discussion that the case study students needed scaffolds. I began by asking them my preplanned question of "how are heat and temperature related". Delia responded that temperature was cold or hot, which was a literal response. So, I followed with the following question: "So how are heat and temperature sort of the same but slightly different?" Diego responds that "how the air is, like how it feels, cause heat, like, its hot;

and the temperature tells you how hot it is." I follow by asking if there was heat in ice. I wasn't sure in retrospect that it was the right direction, but I was attempting to have them differentiate both. Delia responded "no" since "ice is cold". They then say it does have heat, then I ask a series of literal and affirming questions, until they agree that there is heat in ice. At that point, I go into the real-life use of a cold-feeling stethoscope when placed on a chest, and continued with literal and affirming questions until they agree that there is heat transferring from the skin to the stethoscope. I thought Ivan was not responding because he was off-task; yet, I ask him later if he is being off-task or not understanding, and "he seemed very honest and told me that he was not understanding." (Field Notes, February 10, 2015). I had considered my series of literal and affirming questions as "scaffolds" as mediating their learning. This pattern continued through the final discussion, as I "needed to" provide "scaffolding questions" to guide their learning. (Retrospective Field Notes, March 5, 2015). As in previous instances, the "mediating tools" I used to "scaffold" shaped itself more toward an IRE pattern. Below, Table 4.16 illustrates my misunderstanding of questioning scaffolds as a guiding tool from the small-group discussion on February 10, 2015:

Table 4.16   *Excerpt with Misapplication of Questioning Scaffolds*

> T/R(Teacher/Researcher): Now look at your cognate, maybe that'll help you. So, if you think about the thermal heat, remember, and I showed you, like pretended to put a stethoscope on my chest? And you remember what I asked you?
> Diego: It was cold.
> T/R: Yeah. You feel cold, right? On your what?
> Delia: Chest.
> T/R: On your chest, right? And so, what's happening there with thermal heat transfer?
> Delia: The heat's transferring?
> T/R: Right, so what kind of heat is that, we call that?
> Delia: Transferring heat?
> T/R: Okay, what do we call that again, look at your terms.
> Diego: Thermal heat.
> T/R: So that's thermal heat, and what's it doing?
> Diego, Delia, Leticia, Ivan (simultaneously): Transferring.

It is noteworthy to share that all the case study students simultaneously responded to the final literal question asked during the discussion above with a cognate, "transferring". I had reviewed thermal heat transfer at the beginning of the discussion in a review of cognates. As indicated earlier, the cognate review was not part of the design. Nevertheless, the pedagogical insights shared in this section provided me insight into key issues in relationship to wait-time, questioning, and scaffolding, all of which impacted the types of data collected. Three of these, though they were pedagogical issues, also may have been related to the design of the study. Thus, the next section explores the study design, what was gleaned about qualitative research design and how it could have impacted my findings.

Qualitative Research Design: Deviations and Discoveries

Shifting Roles. Conducting a qualitative case study is a dynamic process; it affords the researcher with rich data to analyze and evaluate. Part of interpreting that data requires one to make sense of "lessons learned" (Lincoln & Guba, 1985) from the research process which led to the results. Wolcott (1994) discusses focusing on "drawing attention to your methods rather than your results", with the mindset that if the research does not provide the expected results, "something can be learned about research approaches." (p.35). Knowing this, I sought to find the irregularities and deviations from my design outlined in Chapter Three. This led me to further understanding the various unexpected patterns and themes of data which emerged.

Aside from observing what I deemed to be learned helplessness mentioned earlier in this chapter, students continued to ask me for assistance, and "I couldn't ignore them and turn them down," and recognized that "they know me as a teacher". (Retrospective Field Notes, February 4, 2015). By this time, I realized I "am becoming a definite participant observer rather than a mere observer." (Retrospective Field Notes, February 4, 2015). One notable instance occurred

during an activity that required students to interpret distance using time graphs. My role in this instance was simply to observe, and not to interact with students. However, Delia asked me to help her because she was not understanding. I then chose to guide her as to how to read the graph. While discussing the concept of acceleration with her, I asked her what she would have to use to figure out based on distance, time and what other factor, to which she correctly answered "speed". I further inquired which type of speed, attempting to cue her. When she replied that she did not know, I gave her the initial letter, then the first syllable of the correct response, "constant speed." (Field Notes, March 4, 2015). This was a clear example how I had shifted into a "teacher" role.

Initially, I believed myself to be a participant/observer. Since I wasn't in front of the class or working in small groups with them, and taking notes of what was occurring in the classroom, my assumption was that I was not acting in the role of a teacher. However, I later realized that I was a teacher who was participating with them, through my questioning and guiding their learning in their science classroom. In any case, my assumptions about how I saw myself functioning in different roles differed from how the ELL students viewed them. That is, there were occasions in which I intended to be an observer, yet I found myself acting in a teacher role. This occurred often while I was believed to be in in the observer role, simply studying and noting actions of the case study students in the context of the science classroom. Instead of circulating to observe more clearly what was occurring, I chose to interact. This was not intentional, but more of a natural "teacher instinct". In contrast to how students likely viewed me and interacted with me during the entire study. They tended to ask for my assistance while I was moving about the classroom taking notes. Simply put, it indicates that Delia, Diego, Ivan and Leticia viewed

me as a teacher, not as a researcher in any capacity; and, I was attempting to assume a researcher role. Essentially, our collective assumptions of each other were not aligned.

Thus, acting more as a teacher/participant than observer/participant likely affected the types of questions I asked and the types of responses given by the case study students. Though my goal was to allow the case-study students to elaborate on their answers, my both affirming and leading questions dominated small-group discussions. Yin (2014) points to one major challenge to this type of role when the researcher becomes a "supporter of the group being studied, if such support did not previously exist." Being a teacher in the building and sharing my purpose as a researcher may have suggested to the case study students that I was a practitioner rather than a researcher. One could surmise that it was "natural" for the ELL students to perceive me as a teacher; but, at the same time I thought I would be able to divorce myself from that role and they would view me simply as a researcher. In retrospect, the realization had already presented itself: I had always been a teacher in their eyes. In any case, I began to increasingly notice how my actions were changing because I "wanted to help. However, as an observer, I had to remove myself from that and think deeper about what is impeding their understanding" (Field notes, January, 12, 2016).

Another design deviation example relating to role occurred during a whole-class academic vocabulary lesson given in Mrs. Johnson's classroom. Explicit instruction of the specific academic science terms was a pre-designed intervention without procedural steps requiring any questioning or interaction with the case study students. Still, I decided to question Ivan during direct vocabulary instruction, asking him to recall the definition of a cognate. Upon hearing an incorrect response, I continued to interact by leading him to think of related vocabulary words in Spanish, then revert back to English. When questioning him again, after

providing additional instruction; so, "I had him look at the words in Spanish and the words in English. Ivan then shared that "they were words with Spanish in it". (Field Notes, January 14, 2015). The importance of this intervention was to expose students to cognates using explicit academic vocabulary instruction using specific procedures, then determine its efficacy in the small-group discussions and interviews without any adult collaboration. Though Creswell (2013) states that one may change their role during an observation "such as starting as a non-participant and then moving into the participant role", my role continued to reflect a teacher/participant.

Interviewing issues. The interview process with the case-study students was designed to shed a deeper understanding to their thought process. I found, though, that changes and additions to questions would alter the case study students' responses. The semi-structured interviews I employed allow for a researcher to be more "fluid" with questions and do not require a strict structure, allowing the researcher to follow their "own line of inquiry." (Yin, 2014; Rubin & Rubin, 2011). I found that it was very difficult to not "jump in". Barbour reflects this as "0ne of the hardest things for a novice researcher –or focus group moderator- is tolerating silence, and there can be a temptation to rush into using prompts (Barbour et. al, 2000). This, may have caused me to often shift to literal or closed-ended questions. Often, I used prompts such as "Do you think", to lead students with affirmative questions. This resulted in leading students to answer in the affirmative, or answering for them (see Excerpt 4.5 above). My line of inquiry, then, did not serve a "corroboratory purpose" (Yin, 2014). It is important to remain focused on a few questions, not provide any guidance, and focus on listening rather than speaking (Rubin & Rubin, 2011; Denzin & Lincoln, 2008). By not providing adequate wait-times, it created an atmosphere of teacher-dominated "teacher talk" which appeared to lead to limited types of questions and answers.

Triangulation and reflexivity. Although there some concerns with interviews, the use of multiple tools still permitted the sufficient amount of data to which distinguishable patterns could be discovered. The purpose for utilizing multiple sources in my research was to triangulate the data. Creswell (2012) and Stake (2010) state triangulation as the supporting of evidence from various participants, documents, observations and multiple types of data to increase confidence with findings. This allows the researcher to increase credibility, accuracy and thoroughness to the data analyzed by "corroborating evidence from different sources." (Creswell, 2013). At the same time, though, with some of the methods I employed, there were potential issues that were overlooked. Yin (2014) points out key conflicts with interviews and observations. This was true through my use of leading, limiting and affirming questions, as they tended to dominate my line of inquiry. However, I maintained field notes and reflective field notes throughout my study which promoted further credibility to my qualitative study (Creswell, 2012). Though being reflexive, or "examining oneself as a researcher and the research relationship" (Hsiung, 2010), I was able to develop the awareness, or "consciousness" in determining various impacts I had upon the study. This, along with the multiple data sources utilized allowed me to ascertain distinguishable patterns and themes despite not resulting in some of the findings which were not directly related to my research questions.

Summary

This case study was designed to determine the extent of how cognates, explicit academic vocabulary instruction and discourse on academic vocabulary acquisition and comprehension of science concepts, and considering how my differing roles as a teacher and researcher impacted the study's enactment and interpretation. My findings were significantly affected by several teacher or researcher actions to which the research questions could not produce adequate or

sufficient data.

My actions in an attempt to remain in a researcher role affected both the amount of ELL students' participation and overall quality of student talk. Yet, there were some occasions where the ELL students demonstrated application of targeted academic vocabulary and the identification of other vocabulary both in the pre- to post- cognate assessment, and within a few of the small-group discussions when asked "how" and "why" elaborative questions.

Looking back, several limiting factors appeared to inhibit the efficacy of the interventions. The data revealed factors related to: shift in role from researcher/observer to teacher/participant/observer, inadequate wait-times (types I and II), interrupting of students, limited types of questions in small-groups, leading or affirming questions within individual and focus group interviews, and various design deviations. Additionally, wait-time provided was minimal, which resulted in a succession of literal questions that deviated from the originally-designed questions. Thus, questioning patterns then emerged to find a majority of questions posed reflected limiting, affirming, directing and leading questions. Much of these results were due to unplanned and unconscious shifts in my role which impacted the interventions.

My research deviations, though well-intended, may have impeded any additional positive outcomes that could have been realized if the certain aspects of the design, such as elaborative-type questions asked in small-group discussions and interviews could have been maintained. Providing adequate wait-times also may have allowed the case study students' crucial thinking time to negotiate meaning with each other. Thus, small-group discourse and explicit instruction of cognate interventions, with the above in mind, could have provided the needed scaffolds to promote the case study students' learning of academic vocabulary and comprehension of scientific concepts. As a researcher, I gleaned that though it was important to remain as true to

my design, remaining flexible to operate naturally and cognizant of the role as a

teacher/researcher while conducting research, additional relevant findings could have been

realized. This would effectively bring forth the more distinct and representative voice the English

Language Learner.

Chapter Five: Discussion, Conditions of the Study,

Recommendations, Final Thoughts

In this chapter, I decided to bring forth a somewhat different perspective than that of Chapter Four and previous chapters; that is, it is written primarily through a first-person perspective. The chapter begins with a short introduction that provides a rationale for the use of a predominantly narrative lens. This is followed by a discussion and interpretation of major findings. Third, conditions which may have affected findings in the study are explored. The fourth section is comprised of recommendations, which includes implications and considerations for further study. Finally, narrative and interpretive perspectives utilized in this chapter are bridged within some final thoughts.

Discussion

Creating Voice Through Dialogue

Learning is a social process (Vygotsky, 1978; Gee, 2008). It is constructing meaning. It is allowing one to guide another through a thinking process until the other eventually can demonstrate understanding without assistance (Wood, et.al, 1976). This has been the paradigm I have embraced as a teacher with my students over the last twenty years. It is also within this paradigm that I created and constructed a research design which reflected a specific impetus to provide insight into the learning of middle school ELL students, whom I often had witnessed struggling with academic vocabulary and related comprehension. To that effect, I designed a study that could have uncovered some of these issues constructed through a researcher's lens. Yet it became clear after unpacking the data that I could not remove myself from naturalistic teacher "movements". I often found myself interacting with students in ways that went beyond the role I was enacting at the time. During observations, I found myself being asked by students

to assist them, or found myself asking them questions to determine their understanding. On a few occasions while modeling academic vocabulary with cognates, I posed questions to determine students' understanding; and, during small-group discussions, there were multiple instances where I chose a "detour".

In an effort to explore these instances, I am choosing my own detour through using an interpretive space to provide a window into the "inner voices"- those belonging to myself as a teacher, participant and researcher; and, of equal significance, the unheard voices of English language learners. Lincoln (1995) also impressed a similar stance, asserting how "interpretive or qualitative research must give voice to participants so that their voice is not silenced, disengaged or marginalized." The "inner voices" appeared to best paint the emerging picture that had developed throughout the course of the study. The acknowledgement or recognition of these "muted" voices changed the direction of my original design and ultimately, the course of my research.

The emergence of new paths encountered during the course of research is not uncommon. Creswell (2007) presents qualitative research as an "emergent design", with deference to how qualitative researchers should not "tightly prescribe" how studies are conducted, since "all phases of the process may change or shift". Specifically, he mentions how questions may change; forms of data may shift, and the persons studied and site may be adjusted. Essentially, he presents the purpose of conducting a qualitative study to "learn about a problem or issue" (p. 39). Thus, my decisions did have merit within the parameters of the design. However, in order to construct a complete depiction of all that occurred, it is essential to share as much of my thought processes and "inner" conversations to best depict the live context in which it occurred. Walcott (1994) emphasizes this need to construct a dialogue with the reader, in order to "give voice to

your thought processes," so that "you give others access to them as well." (p.43). A dialogic

approach provides another window into how my varied roles transformed my research. In the

next section, the interactive approach begins with a discussion of key findings embedded in

contextual descriptions.

"Just give me a few more seconds". As a teacher who uses discussion often in my class,

students often ask for additional seconds or minutes to either think of a response or to complete a

thought. This case-study, though unearthed findings regarding wait-times which were

unexpected. I consider myself a practitioner who is typically cognizant of providing students

additional time needed to consider their thoughts. Throughout my teaching career, it has been

one of the key staples within my pedagogy. Suffice it to say, then, how I was completely

confounded discovering I had not provided adequate wait-time during any phase or procedure in

the study. Whether it was conducting small-group discussions, focus group or individual

interviews, I discovered that after posing a question to the English language learners, little to no

wait-time was provided for them to respond, with less than one-half second was the average for

both the first and last small-group discussions. I had anticipated longer wait-times over the

course of discussions, whether it be after asking an initial question or after asking a follow-up

question. It reaffirmed wait-time research reported by Rowe (1974a), who found shorter wait-

times limit students' abilities to elaborate upon their thinking. Perhaps I assumed the "right"

questions were asked, or I had taught it the "right" way. Or, perhaps when I received fast

responses from students, I equated that to a demonstration of their learning.

In any case, as I pondered the possibilities as to why this may have occurred, I recounted

how this process began with the sole intent of having students co-constructing their own

meaning. Yet, when I did not hear the types of responses I had hoped for such as in the case of

Leticia, the tendency was to initiate a "takeover" and direct by asking frequent questions (mostly lower-level, basic questions), or by interrupting students' responses in an attempt to move their learning in the direction I had desired. The noticeable ELL case-study student struggles witnessed may have "tugged on my heart strings", causing me to "reach out", and do whatever I could to bolster their confidence. So, I created a "give and take"; students would be engaged in the discussions with short, literal responses elicited from literal questions, allowing them to feeling successful. However, the questions did not produce the types or quality of responses I had hoped to obtain, nor did they increase the amount of ELL students' participation in discussions. The exchanges appeared to create the opposite from what I intended to attain, by not achieving the desired richness of responses from the case study students.

My intent was to be viewed as a researcher, not a teacher, and at the time it was of utmost importance to portray an objective lens. Yet my role had been primarily one of a teacher and a participant. This began to create an on-going role conflict. Being well-known and respected throughout the building as a classroom teacher and reading specialist certainly contributed to the teacher persona. It conveyed my presence to the ELL students simply as another teacher, which likely affected how they responded to me. Early in the second phase of the study, it seemed I fully embraced the teacher-role as it appeared to be more intentional and purposeful. This role also remained consistent throughout the third phase. Again, though I often led them, my goal was to guide them so they could demonstrate their learning.

"It's right there in the question". As a teacher and as a literacy coach, I have often uttered the following declarative statement to students: "Its right there in the question." This is to suggest that there are specific words provided in a question that indicate key words to include in a response and how to structure that response. It was this euphemism which often reflected ELL

case-study students' responses to me after posing a question. Often, as teachers, we assume

since the words are directly stated in a question that students should be able to begin a response

with relative ease. For example, when I asked in the initial discussion "Would you slide further

on a sidewalk, on the grass or on a frozen lake? Why?", then provided the direction to "Use the

words friction, static friction, sliding friction when discussing with others", assuming they would

be able to engage in a response. The questions had provided them three options to which I

assumed they possessed adequate schema to draw from, and I had provided the academic

vocabulary intervention along with the classroom teacher's instruction. Yet, as I found myself

struggling when not hearing any immediate responses from the ELL students, I immediately

interjected with a series of low-level thinking questions.

Since this seemed to be a particularly common phenomenon, I probed the data further

and discovered the actual number of words in all of the questions I had posed to the case study

students was more than the sum total of all their words uttered; this was over the course of both

initial and final discussions. When delving further, I noticed the actual amount of teacher-talk to

case-study student talk, in terms of the number of words spoken in the first and last discussions

found there were 2776 teacher words spoken to 761 student words spoken; teacher talk

dominated. It numerically equated to least three times as many teacher to student words spoken,

even with the ratio being four case-study students to one teacher/participant. The common

pattern of low-level teacher-questioning, interrupting students, and limiting wait-times all

seemed to lead me to another possible explanation. Perhaps it was also possible that the English

language learners either did not understand the content or words within the question, or the

syntactical phrasing employed to construct the questions. Or, more likely, it was a combination

of factors.

Further, the preponderance of limiting questions I posed in the small-group discussions and interviews accounted for approximately three-fourths of all questions asked. As previously mentioned in Chapter Four, these were mainly comprised of low-level questions which began mainly with "what" or "when". And, there were other limiting questions that followed in the questioning sequence which included leading, directing or affirming question stems. Leading questions were phrased to guide students toward responding in a certain manner, such as during the interview with Delia, where I prefaced my question in a way to guide her toward an answer that would reflect a positive response. One clear example is how I began affirming for her, when I inquired "so when we talked about it, how did that help you?"; and she replies "like, it helped me connect ideas." This automatically guided her in answering in an affirming manner. Another instance occurred in the interview with Leticia. I again provide a direction where she is prompted to respond in a positive manner. I had inquired if she believed that she needed guiding phrases to help discuss, in which she agreed. Yet, the exchange is me providing affirming questions to her. I say to her, "so right now you still need that extra help to help you think through it"? She replies "yeah". So, I inquire further asking "but would prefer in the discussion, right? "Mm-hmm". The use of the phrases "you still need" from the first exchange and "right" in the second guide her in answering in a positive, or affirming fashion.

Directing questions, though similar to affirming in that they are providing directions to the ELL student, do not inquire in the fashion to elicit the positive or affirming response. These questions, "tell" or direct a student to begin responding, often without providing a specific context, and essentially commands, or provides a directive for a student to respond. One such example of this occurred in the final small-group discussion that occurred on March 5. As part of the discussion that day, students were to use a visual graph to construct a story which utilized the

academic vocabulary being learned. Only sharing to students up to the point of "using these words to help you say what's happening in the graph", I ask them to "start talking about what you are seeing here" and immediately follow using similar wording, "So start telling me about what's happening and try to think of those words." There was no guideline or strategic approach provided to these students, but to direct them to start talking. (Small-Group Discussion, March 5) Though these types of questions were not intended to elicit a specific answer, the wording of the question might have had an impact on the types of responses. Nevertheless, all three types of questions- affirming, leading, and directing- were forms of limiting questions which may have restricted student responses to being extremely brief and reduced the opportunities for further elaboration.

Upon further reflection, I realize my intent may have shifted; I was no longer focused on elaboration, but on participation rate. There seemed to be more focus on ensuring that the case-study students experienced success. I assert here that my desire to succeed as a researcher may have also inadvertently played a role in creating an unintended bias toward the case-study students. This unplanned action appeared to be on focus on promoting a positive learning experience. After all, this research occurred in the school where I taught and in a classroom with a teacher with whom I had strong rapport. Thus, because they viewed me primarily as a teacher, the ELL students likely responded in a manner to which they thought I may have wanted to hear, such as responding often in an affirmative fashion to leading questions in the individual and focus group interviews.

The case-study students' paucity of responses may have been due to some degree of "learned helplessness" through their withdrawal from responding, as previously discussed in relationship to Dweck (1975). I had already observed and noted instances of what I deemed to be

"learned helplessness" from the case-study students, either by not participating, remaining silent, or simply waiting for me to lead them. Perhaps their actions of limited participation were related to what I had pointed out previously- they did not understand the scope of the question; or, they may have waited to participate for types of questions to which they knew and could respond "correctly" in order to please me as a teacher, or simply to receive positive feedback. I suspect the use of limiting question-types may have been asked to increase their self-efficacy and to allow them to experience success such that it would increase their engagement in discussion. Regardless, these types of questions hampered ELL students' ability to explore or expand their thinking- to navigate and negotiate their understanding. Reflecting upon my own classroom as a current practitioner, I am often cognizant of how constricting questions can stifle the metacognitive process. In this case study, though, acting within a teacher/participant role may have inadvertently provided the English language learners with an "escape route" to which I guided them to the "exit".

However, there were instances during discussions or interviews which demonstrated increases in both length and depth of response. These were mainly achieved by asking more elaborative-type questions which often began with "how" or "why". The responses from ELL students to those questions produced more elongated responses, since it placed thinking back on students, acting as a scaffold, and providing the guidance which enabled some to explain their rationale. One distinct example of this occurred during Diego's interview while he shared having a conversation in his "mind" during learning. I followed this response by further inquiring, "What's the conversation like?" He was then able to provide thought process which enabled him to facilitate the construction meaning. So, with my guidance, he was able to negotiate how he learned a specific scientific concept. This supports Gee's (2008) and Vygotsky's (1978)

assertion of positing learning as a social construction. It also aligns with the postulations of

learning scaffolds with a capable mentor (Wood et. al., 1976). Of equal importance, it furthers

the research on "questioning" of van Zee et. al. (1997), who found positive results with the

implementation of "reflective toss" which used similar questions designed to place thinking back

into a students' metacognitive domain. Though these instances of success with providing needed

discussion scaffolds were not very common throughout the course of the case study, it

nevertheless provided an additional finding that open-ended questions allow for divergent

thought. This may not be newfound knowledge to some teachers or researchers, but it re-

emphasizes a critical point regarding pedagogical effectiveness. In sum, the vast majority of

questions I posed and the responses were not what I had anticipated nor planned to hear.

Regardless, this discovery illuminated issues to which I may not have been aware, and which

other teachers may also be experiencing daily in their classrooms.

The wearing of many "hats": It's a matter of context. Qualitative research is quite

like classroom teaching: we seek to understand phenomena and seek ways to solve complex

problems. Both have a wide array of variables that can affect an outcome, such as: the

participants, the context or situation, and the setting of research or instruction. It was difficult to

come to grips with these realities until after I had realized qualitative research possessed these

similar characteristics. Within the classroom, though, it was easier for me to recognize and adapt

to phenomena due to years of knowledge and experience, being able to identify and explain my

rationale and reasoning for shifting within my various roles, or "hats" (as a researcher,

participant, observer and teacher) was a more daunting task, as they were unchartered waters.

From the outset, I carefully planned the procedures for each phase of my research, and

was confident the interventions would have a positive impact on the case study students'

learning. Yet, none of this prepared me for the messy, emerging nature of qualitative research. It was only after multiple analyses of the data that I began to realize the dilemmas. It became apparent I was not just wearing one role "hat", but many- both simultaneously and interchangeably: as a researcher, observer, participant, and teacher. These were not premeditated shifts, but seemed to be embedded in multiple contexts. However, stepping into the shoes as a teacher in an attempt to function as a participant/researcher created multiple, entangled roles that would weave themselves into my narrative fabric.

Walcott (1994) stated that focusing in on a study's methodology can provide some insight in times when researchers experience unexpected results. The role and function of the researcher as part of the design was of particular importance in this study. Recognizing that my roles were fluid, these "interactive" shifts began occurring the very first week. Yet I attributed these changes to "learned helplessness"; and, as such, the teacher within me "could not let them down." (Retrospective Field Notes, February 4, 2015). Though I attributed my shift in perceived role to the students' possible learned helplessness, they did not modify the study's construct. I did. My goal from the outset was to be an objective researcher. Now, in retrospect, I ponder: how can one ever be completely objective in any research capacity, particularly one in which the researcher has an enduring participant role of being a teacher. Admittedly, I had a previously held the notion of a researcher operating through a completely objective lens; this paradigm likely created some "uncomfortable" conditions- not just for the case-study students, but for myself.

My interactions with the English language learners were initially presented as being in the role of a participant, yet they were more those of a teacher and participant. The case-study students often solicited me for assistance, and I responded. To ignore their requests would not be

ethical, even considering I had the intention of remaining neutral. Further, they viewed me as a teacher and interacted with me as such. My primary goal as a teacher and researcher was to discover ways to improve ELL students' learning in science. In hindsight, divorcing one role from the other was an unrealistic expectation. How could I have seamlessly taken off the observer "hat", put on a participant "hat", then morph into the "teacher" hat? My goal to be objective may have had an over-emphasis on remaining "detached." I was focused on implementing the design as precisely as possible. This previous assumption created dilemmas that affected the interactions between myself and the English language learners.

Typically, I believe I am more conscious and intentional of my actions as a teacher during instruction. Many teachers on a daily basis acknowledge the context of the learning situation, then become responsive and change direction of instruction or interaction to meet the needs of their learners. They are essentially shifting and adjusting their roles as educators to address a phenomena or dilemma. This was not dissimilar to the line of questions posed to the case-study students during small-group discussions after providing limited wait-times. I attempted to modify the types of responses they were providing so I could meet their needs, while allowing them to further engage and respond. In reflecting, perhaps the ELL students were understanding the questions being asked; or, perhaps limiting wait-time was a reflection of my own desire to succeed and ascertain the data I had hoped would emerge. Though I did not consider the above of note during the course the study, I availed myself to the possibility that my desire and passion as a teacher likely attributed to some of the data which was unearthed. That being said, my role in adjusting to the learning phenomena with the case-study students could be due to both issues with design and interpersonal relationships that I developed with them.

When teacher/researchers conduct research within their schools for the purpose of gaining relevant and rich data, being responsive or being fluid with one's roles does not necessarily lend less credibility to the research process. In fact, since research deals with the human experience and reflects genuine exchanges between people, these types of interactions lend authenticity to the research. In my case, building rapport was not a distraction or a condition but a natural and necessary component. Exploring data to uncover phenomena within a real context is the purpose. Qualitative research allows for the flexibility of a researcher based on the context of emerging data to consider alternatives, though not specifically in a study's design, to continue exploring an issue or learning phenomena (Creswell, 2007).

Thus, I discovered that roles and contexts which include building or having rapport and being responsive to what occurs in live situations all can provide emerging, "on the spot" challenges for qualitative researchers, but also yield opportunities to delve further. Stake (2008), furthers this assertion stating how context can make a strong contribution in understanding various relationships. Perhaps my "live" adjustments were rooted in the difficulty for me as a teacher to bear witness to any student who struggles; whether they are an ELL student, a higher-performing student, a typical "average" student, or students who have other learning issues. In this case-study, my natural instincts as a teacher strongly manifested themselves and unconsciously altered the path of the research. Though these adaptations were unplanned, they did provide further insight into learning, pedagogy and research. It is challenging to attempt to "control" the context and to remain "pure" to the specific procedures planned.

The ability to adjust "on the fly" reaffirms my decision to choose qualitative research. Though these changed the direction of my initial plans, and though provided me with challenges, the rich data lies within the negotiation of language in a "live" context which allows for

researchers, especially teachers doing research, to respond naturally. Further, the use of daily reflective field notes allows for researcher reflexivity, which would provide insights relating to my own perspectives, values, and biases in relation to decisions made while conducting research (Lincoln & Guba, 1985). Thus, it resulted more authentic findings, which can provide other researchers, teachers, and those with a vested interest to benefit from an honest rendering through various lenses.

Conditions of the Study

First, I conducted this study with the clear intention of allowing students to voice their ideas and share insights with me about their learning. Yet, I find myself here reflecting upon my own unplanned influences on the case study ELL students and the how the study came to unfold. Walcott echoes this as he calls for a "full disclosure" when the "analysis itself provides no comforting level of security" (p.34). That being said, perhaps my expectations of the English language learners were somewhat unrealistic and my influence was present no matter how questions were presented. Throughout the various phases of the case study, I found often myself "engineering" how the case study students were to stay on-track. That is, throughout the classroom observations (where I acted in a participant/observer/teacher role), small-group guided discussions, and interviews, I inadvertently impacted the thinking path for students. As a teacher, I do this within my own instruction, but attempting to think through a limited researcher lens, as mentioned prior, restricted my actions. Though I appeared to be functioning as a teacher, and responding as such, the nature of these questions may have constrained their academic voices. This is not to imply that a practitioner's typical actions with their students is a limitation, but to simply point out in this context that it impacted how students responded to me as a teacher within the various contexts of this research.

Second, it is important to point out how a case study can be constrained in terms of time, location, events and processes (Creswell, 2007). I had planned for a full six weeks of small-group discussions, but there were several days lost to various factors such as school closings due to inclement weather, national holidays, teacher professional development days, and annual required standardized testing. There were also student absences due to not attending school or being removed during their lunch time by a classroom teacher to make-up a lab in Science or work not completed. All of these unplanned factors caused significant loss of time. Further, if that time were not lost, additional data could have been gathered to either determine new patterns or reaffirm those previously uncovered.

Third, I was bound by the school and the school's daily schedule which constrained both myself and the ELL case study students. The location itself, though carefully chosen, did not prevent me from "blind spots" that could not have been prevented regardless of how informed I had been of the school, of Mrs. Johnson and her typical practices, and the daily schedule. I first considered using the last ten minutes of class time to do small-group guided discussions within the framework of the classroom. However, after the study commenced, Mrs. Johnson shared she did not have enough time for teaching all of the required material that had been mandated by the administrations of both the school and district. Thus, there was only one time that the case-study students and I shared: lunch-time. We ate our lunches together, and I used the remaining time to facilitate the discussions.

One would think eating lunch together with your study participants would compromise the research process or be considered a possible consideration in this research. Yet, spending time with these students, all of whom who knew me, created a friendly-rapport and deepened rapport. It is natural to develop relationships when spending so much time together during the

course of the study. Spending time during lunch built a stronger rapport with students; and though I initially thought it negatively impacted the study, it enriched it. In my classroom, where these interactions took place, I embraced my teacher identity. Yet, it now leads me to consider that as a researcher I had created unrealistic expectations of myself. There was a conscious attempt to "control" my own identity as a teacher. Building rapport and constructing social interactions with students has been at the core of my epistemological paradigm on how students learn for over twenty years. Being unaware, I created a conflict placing myself in the researcher role; thus, the discussion and interview environments felt unnatural. There seemed to be a tension that was unexpectedly created which prevented me to be grounded in the roots of my instructional approach. I typically would wait longer for students to respond, and would be a more conscious listener with much less interrupting. It was as if I removed myself from my "natural space" as a teacher. Apparently, the unconscious assumptions about researcher objectivity led me to abandon my identity as a teacher, and limited the natural development of teacher-student relationships where the co-constructing meaning with the ELL students would have had a stronger chance of success. Moving forward, it is clear that developing rapport does not confound either the study's design nor its findings, and certainly does not repudiate the qualitative research process. In essence, I simply functioned a teacher throughout my research.

Yet, even in consideration of their somewhat muddled nature, my roles allowed for some deeper reflexivity. In this interpretive space, though I would like to offer further insight to what may have caused the uncertainty of my role. When "looking outside", it occurs that I remained in a participant/teacher role from the outset of the research. Because of this, students were able to engage with me from the first days of observation in Mrs. Johnson's classroom; this created a pattern which began to ultimately alter how I would be seen by the ELL students and function.

At the same time, it occurred I was actually in the midst of being an "adaptive" researcher who was responsive to the differing social and learning environments as they presented themselves to me. Johnson Middle School, after all, was my place of employment and those environments were a reflection of my daily life with students and staff who saw me and interacted with as a reading specialist and teacher.

When looking inside", there were many instances where I had acted as a teacher, yet I had assumed I was functioning as a researcher within a research paradigm. I continue to be aware of the dilemma of roles and my attempt to separate them. Again, the goal was to ask questions which would allow students to engage so that I could hear more of their internal and external voices. It was the clear objective to hear the case-study students' thinking processes aloud and determine how they were constructing meaning so I could uncover patterns for analysis. It occurs to me now that this desire to question them to engage their thinking was not necessarily geared toward deeper information, as my analysis showed. It was more of a spectator "rooting" for their team to perform. Again, I was operating in multiple roles and it both complicated and clouded my actions and thoughts, since I had been operating from various lenses simultaneously. And, though unintentional, these actions prevented me from promoting and reflecting my epistemology that learning is a socially co-constructed process. It was difficult to have expected myself, or any teacher/researcher to remove their natural subjective-self. Unrealistic expectations create various underlying and unconscious conflicts that can muddy the research process. This is not uncommon for qualitative researchers. Chaudhry (2005) reflects a similar intricate undertaking, pointing out how she had "multiple identities", discerning how she tried to "figure out the course of action", acknowledging there is "no right path", and recognizing had been "conscious of my marginality" within her own study. Only when distancing oneself

after disseminating and sifting through data multiple times from multiple lenses can one begin to become reflexive. Only then can a researcher retreat and begin the self-inquiry of asking: What really happened? Why?

Perhaps this idea of self-inquiry can be best addressed during my data analysis phase. I initially went into constructing my findings in a very simplistic fashion. That is, the lens that was adopted attempted to do precisely what was done during the collection of data. As previously mentioned, it was my primary research goal at the outset of the study to attempt to remain "neutral" and objective. The mindset was to simply report what I saw or heard: a "raw objectivity". Though, as I struggled with understanding why the case study students were not responding as much as expected in the small-group discussions and interviews, there was a realization that something had to change in my analytic approach.

I took the stance that I had to be at fault; that is, my actions were causing these phenomena to occur. What was it that I was doing? Thus, stepping back and looking at it through my personal lens, patterns began to emerge. The raw amount of words I had spoken in each of the discussion and interview phases dwarfed all of the ELL students combined words spoken. This caused further introspection, when then found a preponderance of limiting questions of varying types, and extremely limited wait-times. I was now not only becoming more reflective of my action, but now of my intent. The realization struck me that I was in a teacher role throughout the entire study and my desire to see these students succeed was a natural behavior as a teacher. This shed light into what I had found. Separating oneself, especially as a teacher could never truly have occurred. Thus, embracing this lens granted access to "seeing" my own instinctual actions as a teacher who was researching students.

Recommendations

  Implications. This research, though it did not find what I had sought to uncover, did have some significant findings with implications for practitioner researchers considering case study as a method of research. First, there are some implications for secondary classroom teachers who teach the typical disciplinary subjects such as Science, History, Math, English, and other related courses. The case study students exhibited struggles with learning and applying both academic vocabulary and the related science concepts. Additionally, by providing limiting questions which I believed to be scaffolds were only restricting the amount and types of responses that these students could provide. Teachers who experience students struggling may unintentionally revert to the IRE questioning process (Cazden, 2001) and focus more on determining literal comprehension.

  In my research, these began with common question stems beginning with "what", "when" or through seeking affirmation with a question stem such "do you". However, when I asked more formative questions, such "how" or "why" either as an initial or follow-up question students had to construct additional reasoning. This supports Vygotsky's (1978) notion of "a more knowledgeable other" in a social context to develop a mental framework. One such example was the interview with Diego, where I was able to ascertain additional information by asking about the "conversation in his mind" and "how does that help you" when referring to cognates. Maintaining a focus on elaborative opportunities can enable ELL students to metacognitively engage to construct their own meaning. This supports research by Cazden (2001) and Rowe (1986) who both support metacognitive-type questions which focus thinking on process. There should be fewer questions asked of students, yet be more complex (Rowe, 1986).

Additionally, when working any student, providing time to think is critical. Limiting wait-times, as previously found by Rowe (1974a), have found that typical wait-times are quite short. This was the case as my findings revealed a significant pattern of wait-times averaging less than one second. Short wait-times are more commonplace in many classrooms, despite the intentions of the teacher to spark student thinking and motivate students to engage. In my case, I noted how their "learned helplessness" contributed to my increased interactions. My focus as a participant quickly shifted into a caring teacher who appeared to be more focused on engaging the ELL case study students. I have not only experienced this as a classroom teacher and researcher, but as a literacy coach observing other students.

Next, building the self-efficacy of students who struggle and avoid engaging in discussions is certainly an important factor to ensure participation so they verbalize their thinking and socially construct meaning. As educators of population whose first language is not English need the time to process the words and concepts they are learning. ELL students appear to need additional time to do metacognitive tasks since they are negotiating both the language and the academic task. These implications support the seminal research of Paris, Lipson and Wixon (1983) who emphasized the contextual development and self-controlled metacognitive strategies as key to promoting comprehension and learning. It also supports Au (1993; 2002), who found using interactions within one's own environment, such as school, should be part of learning so that students' cultural and linguistic capital can be realized. Though it may seem an elementary instructional practice, providing additional wait-time can enable students' abilities to elaborate their reasoning and positively impact their own self-efficacy.

Further, for those who work with practicing teachers through professional development, or professors providing instruction to those who are either preservice general teachers or those

seeking an ELL endorsement, providing them with strategies will enable these practitioners to have some solid foundations for this growing population of students. Darling-Hammond (2009) shares a similar view supporting "improvements in teachers' knowledge and instructional practice which have positive implications on student learning. Teachers will have the increased instructional repertoire to address some common instructional pitfalls not only for ELL students, but for other struggling students. Principals and literacy coaches also have a sizeable stake in this to provide their instructional staff with strategies that cross across disciplines, allowing for greater success for all stakeholders, including the students themselves.

Much has been written about practitioner research, but I stress the need for teachers to research one's own instructional practice. As discussed previously, this process allows introspection as to how a teacher negotiates their own role with themselves and their students. Within my experience, I recognized how I first struggled by attempting to remove myself from interacting with the ELL students, yet later found that when in a live context, the pressure determining whether to be a researcher and a teacher was a challenge. Observing my own actions, and not just the students' actions led to these conclusions.

Though my findings reflected how I changed within my actions in the role of a teacher, I had to determine how these actions would influence the quality of my data. It led me to consider the possibility that the English language learners were not comprehending the higher-order thinking questions, which could have sparked my inclination to shift to lower-level questions. Though I began with the goal of remaining true to my pre-designed higher-order questions, seeing the ELL students succeed appeared to have become my first priority. Perhaps I internalized their academic struggle as I witnessed it, and the issue became whether or not to abandon the higher-order questions so I could enable opportunities to build their self-efficacy.

Thus, teachers and researchers must carefully consider not merely the students actions, but their own as well. These various introspections could only occur while looking at it through multiple, reflexive lens. Whether it be research at the university-level or at the classroom level, there is a need to navigate through differing social situations within research, and both should draw upon research theory that looks at the complexities of researching one's own setting. The teacher as researcher though must function in their primary role as a practitioner while being true to the students. That being said, there are many potential self-discoveries that can be unveiled while conducting research within one's own instructional environment. Not accepting the fear of looking within, but strength to inwardly contemplate with an open mind, allows teachers to grow as practitioners who can experience change from examining both themselves and their students.

Further, the examination of one's own role brings forth additional considerations. Lincoln & Guba discuss these social phenomena and human dilemmas as situational, and are common within the context of qualitative research (Lincoln and Guba, 2000). Researchers need to contemplate when it is most appropriate in changing roles, such as considering change from a participant/observer to observer or to consider when to shift from researcher to teacher. With students, who are children first before being considered a research "subject", it is natural to interact with them to alleviate their emotional or academic stress. Qualitative researchers need to further consider the "humanistic" characteristics of those participants in their study when designing it beforehand. My choice was to first be responsive and responsible to the students. This is a critical point to consider when researching in the classroom. As much as one plans to be objective when designing research "from the outside", situations can and will present themselves which can be difficult to predict. However, to silence students' voices purely in the name of objectivity, does not reflect a pragmatic approach nor consider how it can affect the participants

involved. Therefore, to have some flexibility with one's role is critically important. It reflects the true nature of qualitative research and contributes to its "realness", its authenticity.

      Considerations for Future Research. After designing, implementing and analyzing my research, I found areas some further research which should be explored. Keeping in mind how fluid teaching can present itself in terms of engaging students and making pragmatic decisions, conducting practitioner research could yield tremendous data. The advantages of implementing practitioner research are plentiful to discovering the pragmatics of various interventions. If I were to redesign using this mode of research, my role would certainly now be more focused as a participant/observer as opposed to mere observer. It would allow for more rich data. Creswell (2014) suggests that for participants researching in their workplace, that information may be "convenient and easy to collect" but may jeopardize the role of the researchers and participants. Thus, he points out how researchers "hold the responsibility for determining how data will not be compromised." (p.188). I suggest throughout data collection and analysis being open and forthright, using both observational and retrospective field notes. These, along with triangulating my own data allowed me to maintain the integrity and the authenticity of my research.

      Additionally, I would recommend to teachers, professors, and researchers to be continually reflexive to the human nature of both qualitative research their own instructional practice. This can open new doors to one's own unconscious belief systems. Often, teachers espouse a theoretical lens, many of whom possess a sociocultural stance, there can have an unconscious, unknown gap between what they believe instructionally and how they actually deliver instruction. Reflecting upon this research as an active practitioner, it would be advantageous to teachers to engage in a reflexive process. This recursive thinking could shed light to a teacher's own instructional practice to determine the how it truly aligns with their belief

systems. This may allow teachers to become more aware of how they interact with students in various instructional contexts. Researchers being reflexive allows for continuous introspection and permits one to engage the "self" throughout the research process.

Further research related to the effectiveness of cognates on academic vocabulary in science at the secondary levels with ELL students should strongly be considered. This is still a scant amount of research accomplished. Specifically, further qualitative types of inquiry seeking how middle and high-school students, who are identified as ELL students negotiate their first language with academic vocabulary would shed additional light on this research. The limited scope of quantitative research limited to younger English language learners and the previous non-existence of qualitative research with English language learners and cognates at the secondary levels were the impetus for this study. Continuing to determine the "hows" and "whys" to which these students construct meaning when integrating cognates as a "metacognitive step" can open new avenues and possibilities for utilizing the linguistic capital this underserved population possesses.

To complement and provide deeper understanding of how ELL students negotiate their language is the continuing need for research which employs both the use of questioning scaffolds and increased wait-times in small-group discussions. This research merely scratches the surface of these issues. Determining the extent of teacher questioning and discourse toward activating ELL students' thinking about cognates, academic vocabulary and conceptual understanding needs to be explored. Small-group discussion opportunities should provide ELL students multiple opportunities to express and explain their academic knowledge in a supportive, non-threatening environment.

Additionally, research should include working with secondary-level ELL students or working in an environment where the teacher has previously established a positive classroom culture and climate and is well-versed with effective discussion techniques. This would address some of the concerns of this study and more relevant data to the original research questions could be discovered. It would also be advantageous to investigate whether income or gender impacts ELL students. Another avenue is to have reading specialists, literacy coaches, and bilingual teachers implement research on many of the areas suggested above. Each bring a specific research background and specialized set of teaching skill sets to address a growing dilemma of providing equity of instruction for all students.

Final Thoughts

I found that when we research with human beings, the conditions must allow for those people being studied to be "human". This suggests we see those who we study as complex beings. Each "subject", including the researcher, brings forth his or her own certain preconceived understandings of people and of contexts. Each person and each setting brings a myriad of possibilities in to a research context which we should not try to limit or restrict, but to explore and explain; to unveil the truths so we can better understand the nuances of how we think and act in social contexts. This research brought forth an honest rendering of these representative challenges which not only qualitative researchers experience, but what classroom teachers experience on a daily basis. That being said, questions still remain from this research about how effective implementing cognates, academic vocabulary, and small-group discussions can be used toward facilitating academic vocabulary and comprehension of Science concepts. Though I struggled to effectively address my research questions, my data revealed much that both teacher and researchers must consider when interacting with students to construct meaningful dialogue:

construct questions that elicit elaboration, provide adequate wait-time for responses, and understanding the fluidity and complexity of a researcher's role in qualitative research. Much of value was learned by this teacher, participant, researcher. Stake (1995), though, reminds and directs us to the true nature and objective of qualitative research, in that "the quality and utility" of case study research is "whether or not the meanings generated, by the researcher or reader is valued."

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Appendices

Appendix A

Instructions for Cognate-Circling Task

Some words in English are spelled the same, or almost the same, as words in Spanish, and have almost the same meaning. For example:

> *importance* in English and *importancia* in Spanish *illustration* in English and *ilustracion*
>
> in Spanish *decide* in English and *decidir* in Spanish

Such pairs of words are called *cognates.* Recognizing cognates may help you figure out some of the hard words you come across when you read in English.

In this test, you will see copies of the passages you have just read. This time, go through these passages and circle all the words that are similar to Spanish words in both spelling and meaning. Here's an example:

> *During the past few years, people have been investigating some animals that live in the*
>
> *oceans. These animals are dolphins. They are small members of the whale family.*

In this passage, several words are similar to Spanish words. You could have circled the following:

> *investigating* because it's like the Spanish word *investigando*
>
> *animals* because it's like the Spanish word *animates*
>
> *oceans* because it's like the Spanish word *oceanos*
>
> *dolphins* because it's like the Spanish word *delfines*
>
> *members* because it's like the Spanish word
>
> *miembros family* because it's like the Spanish word *familia*

If you have any questions while you are taking the test, please raise your hand.

Near the end of the time limit, I will tell you how much time remains. When you are finished with the test, turn it over and wait quietly.

Venus

[Passage adapted with permission from J. Myers (1985), Venus: The hot and cloudy planet. *Highlights for Children, 40,* 8-9.]

Venus is the most brilliant of all planets. In its size, mass, and distance from the sun, it is the planet most similar to the Earth. For these reasons, it has been called Earth's "sister planet."

Much of what we know about Venus was discovered in recent years by spaceships sent there by Russia and the U.S. One of the hardest working spaceships ever sent into space is Pioneer Venus Orbiter. It has been orbiting Venus since 1978, sending back thousands of photographs and measurements obtained by its scientific instruments.

When we look at Venus through a telescope, we never see its solid surface because it is always hidden by a thick cover of clouds. In the photographs, we see cloud layers and formations shaped by wind patterns. These clouds are a special part of the planet's atmosphere.

It's surprising to think that Venus has about a hundred times as much air as Earth, even though you could not breathe the air on Venus. The gases in Venus' clouds are very different from those on the Earth. Venus' air contains mostly carbon dioxide, but no oxygen.

Venus has a different climate from the Earth. We are accustomed to seeing clouds part of the time. Venue has them all of the time. Our clouds are made of water vapor while Venus' clouds are made of sulfuric acid. Since clouds reflect sunlight, Venus appears brighter than the Earth.

Venus' atmosphere acts like a big blanket that warms the planet. The little bit of sunlight that gets through the clouds warms the surface. As the surface gets warm, it gives off heat. The gases of the atmosphere absorb this heat, keeping the surface hot and the atmosphere warm.

On Earth, our atmosphere works in the same manner. But our air is less dense and has only a little carbon dioxide to absorb the heat. If Venus had an air blanket like ours, its surface would be only a little warmer than ours. Instead, its actual surface temperature is about 900 degrees Fahrenheit, which is greater than the highest temperature of a kitchen oven. You can see why there are no oceans on Venus; any water there would have boiled away long ago. Venus is hotter and dryer than any place on Earth.

Target cognates: orbiting (orbitar), instruments (instrumentos), accustomed (acostumbrado), atmosphere (atmosfera), brilliant (brillante), solid (solido), telescope (telescopio), climate (clima)

False cognate- mediciones (measurements)

Appendix B

Small-Group Guided Discussion Questions Including Academic Vocabulary

These questions were pre-planned questions to guide the small-group discussion, but based on

the case-study students' responses, additional questions may be asked.

A. Initial Small-Group Discussion Pre-Planned Questions

1) How does friction impact everyday life? Use the words friction, static friction, sliding

friction when discussing with others.

2) Would you slide further on a sidewalk, on the grass or on a frozen lake? Why?

Use the words friction, static friction, sliding friction when discussing with others.

3) What problems are most likely to occur in an engine that runs out of oil and is not

properly lubricated?

B. Final Small-Group Discussion Pre-Planned Question and Directions

Words Listed on Board: acceleration, deceleration, constant speed motion, distance

"I want you to talk about what's happening in this graph that you see. I want you to start

using these academic vocabulary words (pointing to board) to help you say what's

happening in that graph and tell a story just like you did in class. Start telling me about

what's happening and try to think of those words."

Appendix C

Focus Group Interview Protocol with Case-Study Students

These interviews are semi-structured. The questions below will guide the discussion, but based on the answer to these questions, additional questions may be asked.

1. Did using cognates when you were learning the academic vocabulary for the first time helped you understand its meaning? How? (follow-up)

2. Do you think that, as Latino students, when teachers use cognates that it helps you learn science words? Can you tell me why you think that? (follow-up)

3. Do you think having the opportunity to discuss with others helps you learn better? Why do you say that? (follow-up)

4. Do you think the discussion questions with vocabulary words helped you understand the science words better? Can you tell me how and why you think that? (follow-up)

5. Do you think there should be more discussions with phrases to guide your thinking would help you connect ideas in science? Can you tell me more about that? (follow-up)

Appendix D

Individual Interview Protocol for Case-Study Students

These interviews are semi-structured. The questions below will guide the discussion, but based on the answer to these questions, additional questions may be asked.

1. Did using cognates help you with understanding of academic vocabulary in science? Can you tell me how it helped you understand? (follow-up)

2. Did you try to think of a Spanish word when you heard or saw that science word at any time during class? Can you tell me what you were thinking as you were trying doing that? (follow-up)

3. Do you think you will use cognates to help you with other words in Science and your other classrooms? How will you do that? (follow-up)

4. Did the discussing the academic vocabulary help you connect the words into a bigger idea? Can you tell me how you used them to help you? (follow-up)

5. Do you think there should be more discussions with phrases to guide your thinking would help you connect ideas in science? Can you tell me more about that? (follow-up)

Appendix E

Academic Vocabulary Instruction with Cognates

The following instructional procedures described below occurred three times per week for a total of eight weeks:

1) During the first 5-7 minutes of the period, students were explicitly taught with the cognates along with academic vocabulary terms. This direct instruction reflected the first three steps Marzano and Pickering (2006) instructional approach with those terms. Explicit instruction was comprised of the following:

   a. Students rate their knowledge of the word on a one through four scale

   b. I provide them with a brief "real-life" example of the term, then an explicit definition. Example- For the term *troposphere*, I would say something such as the following: "Have you ever looked at the clouds and know it was going to rain or see no clouds and know it is sunny?" That layer of the atmosphere where all weather occurs is called the troposphere.

   c. Initially, I explain that a cognate to students as a Spanish word as one with similar spellings and/or meanings to English words.

   d. Using a smartboard or whiteboard with the Marzano vocabulary template (each student has a paper copy), I highlight, using a different color, the part of the word that is a cognate and explain how the cognate either has similar spelling and/or meaning to the Science term. For example, if the term was *troposphere*, the Spanish cognate would be *troposfera*, and I would highlight "*tropos*" and "*er*".

   e. Students are instructed to highlight those parts of the cognate on their Marzano template copy.

f. I would then provide the students with a working definition of the term.

g. Students then paraphrase and write their own definition in the definition box of the template.

h. Then, students are to create a quick visual such as a drawing or graphic organizer in the lower left box of the template of the word that would help them remember their paraphrased definition.

During classroom instruction by the classroom teacher, students are asked a make conscious effort to notice anytime they hear or see the academic vocabulary word (e.g. during science readings, discussions, group work or lab work, etc.), they think of the cognate and the word's meaning.

Appendix F

Consent Form for the Classroom Teacher

Teacher:

You are invited to participate in the study, *Facilitating Academic Vocabulary Acquisition and Comprehension through Cognates and Oral Discourse: A Case Study of Middle School English Language Learners in the Science Classroom*, conducted by Jeffrey Mihlon, a doctoral candidate in Reading and Language at National Louis University, Wheeling, Illinois.

The purpose of this study is to investigate how the use of cognates and oral discourse can facilitate English Language Learners (ELLs) learning of academic vocabulary and conceptual understandings in Science. You are invited to participate in an interview that will last approximately 30 minutes at a location that is convenient for you. There are no risks associated with this research and your participation is strictly voluntary. The interview is comprised of a series of questions regarding teaching academic vocabulary, using classroom discussion and differentiation. It is possible that a follow up interview will be requested depending on other identified needs for the research. The interview will be audio recorded and transcribed. The transcription of the interview will be presented to you for verification of accuracy.

Your participation is voluntary and you can withdraw from the study at any time without penalty to you. All information you provide will be kept confidential in a secure location. For confidentiality purposes, interview transcripts, observations, and all files pertaining to your participation in this study will be stored in a locked cabinet for at least ten years and destroyed afterwards if no longer needed. Dr. Susan McMahon, National Louis University faculty member, and doctoral committee chair, will keep all associated computer files on a secure server and ultimately destroy the information.

I will maintain a copy of the data on a password-protected computer and am the only person privy to your actual name.

The interview will be given a secure code. A pseudonym will be assigned to your name to keep all the information fully confidential. Data from my research will be in my dissertation and may be presented at public forums, at conferences, or in journals, but this will be done only in general terms. Under no circumstances will your name appear in these writings.

The study has been approved by National Louis University Institutional Review Board, chaired by Judith Viola who can be reached at judah.viola@nl.edu; or at 312-261-3527.

Please feel free to contact me should you have any questions at 847-708-2508, or via email at rdtch555@aol.com. You may also contact my dissertation director, Dr. Susan McMahon at: SMcmahon@nl.edu; or at 630-874-4323.

A signed copy of this consent form will be provided to you. To grant your consent, please sign below.

Thank you,

Jeffrey Mihlon,

Doctoral Candidate,

National Louis University

I consent to participate in this study.

Name_____ Signature_____ Date_____

Appendix G

Consent Form for the Student's Parent-English

Parent or Guardian:

You are being asked to grant the permission for your child to participate in a research study conducted by Jeffrey Mihlon, doctoral candidate at National Louis University, Wheeling, Illinois. The study is entitled *Facilitating Academic Vocabulary Acquisition and Comprehension through Cognates and Oral Discourse: A Case Study of Middle School English Language Learners in the Science Classroom*. The purpose of this study is to investigate how the use of cognates and oral discourse can facilitate ELL students' disciplinary literacy in relation to academic vocabulary in science to enhance their understanding of scientific concepts.

As part of the study, your child will receive specialized instruction in order to improve his or her academic vocabulary and comprehension in Science. I will first ask your child to do a vocabulary activity, which asks them circle certain types of words. Then, approximately three days a week I will teach your child academic vocabulary. The next school day, at the beginning of Science class, I will have your child in a small discussion group for about seven to eight minutes to discuss the words taught to him or her by myself or science teacher. This will occur for eight weeks. In the last week, I will interview your child about their experiences, and have him or her do another circling task again, along with talking with other students who are in the study. All of the discussions and instruction will be recorded for audio but not videotaped.

With your consent, your child will be interviewed for about 30 minutes. Upon request, you will receive a copy of your transcribed interview at which time you may clarify information.

Your child's participation is voluntary and you may discontinue your child's participation at any time without penalty. Your child's identity will be kept confidential by me and will not be

attached to the data. Only I will have access to all transcripts, taped recordings, and field notes from the interview(s). While your child is likely to not have any direct benefit from being in this research study, his or her taking part in this study may contribute to our better understanding of how we can improve academic vocabulary and comprehension for English Language Learners in Science. While the results of this study may be published or otherwise reported to scientific bodies, your child's identity will in no way be revealed.

In the event you have questions or require additional information you may contact me: Jeffrey Mihlon, National-Louis University, 1000 Capital Drive, (847) 465-0575, or rdtch555@aol.com. If you have any concerns or questions before or during participation that you feel have not been addressed by me, you may contact Susan McMahon, SMcmahon@nl.edu, 630-874-4323, or the chair of NLU's Institutional Research Review Board:
Dr. Judith Viola, National Louis University, 122 South Michigan Avenue, Chicago, Illinois 60603; (312)-261-3527, email: judah.viola@nl.edu.

_____

Parent or Guardian Name (Print)

_____   _____

Parent or Guardian Signature   Date

_____

Researcher (Print)

_____   _____

Researcher Signature   Date

Appendix H

Formulario de Consentimiento para el Padre del Estudiante- Spanish

Padre o Tutor:

Se le pide a otorgar el permiso para que su hijo participe en un estudio de investigación realizado por Jeffrey Mihlon, candidato doctoral en la Universidad National Louis, Wheeling, Illinois. El estudio se titula Facilitadora Vocabulario Académico adquisición y comprensión a través de cognados y Discurso Oral: Un estudio de caso de la escuela secundaria de inglés como segunda lengua en el aula de ciencias. El propósito de este estudio es investigar cómo el uso de cognados y el discurso oral puede facilitar la alfabetización disciplinaria estudiantes ELL en relación con el vocabulario académico en la ciencia para mejorar su comprensión de los conceptos científicos.

Como parte del estudio, su hijo recibirá instrucción especializada con el fin de mejorar su vocabulario académico y la comprensión de la ciencia. Primero voy a pedir a su hijo a hacer una actividad de vocabulario, lo cual les pide círcular ciertos tipos de palabras. Luego, aproximadamente tres días a la semana voy a enseñar a su niño vocabulario académico. El próximo día escolar, a principios de la clase de ciencias, tendré a su hijo en un pequeño grupo de discusión por alrededor de siete a ocho minutos para discutir las palabras enseñadas a él o ella por mí mismo o por el profesor de ciencias. Esto ocurrirá durante ocho semanas. En la última semana, voy a entrevistar a su hijo acerca de sus experiencias, y que él o ella realicen otra tarea circulando de nuevamente, junto con otros estudiantes que están en el estudio. Todas las discusiones y la instrucción se registrará para el audio, pero no serán grabadas en video.

Con su consentimiento, su hijo será entrevistado durante unos 30 minutos. Previa solicitud, usted recibirá una copia de su entrevista transcrita momento en el que usted puede

aclarar la información. La participación de su hijo es voluntaria y usted puede suspender la participación de su hijo en cualquier momento sin penalización. La identidad de su hijo se mantendrá confidencial por mí y no se adjunta a los datos. Sólo voy a tener acceso a todas las transcripciones, grabaciones magnetofónicas, y notas de campo de la entrevista (s). Mientras su hijo es probable que no tiene ningún beneficio directo por participar en este estudio de investigación, su participación en este estudio puede contribuir a nuestra mejor comprensión de cómo podemos mejorar el vocabulario académico y comprensión de inglés como segunda lengua en la Ciencia. Si bien los resultados de este estudio pueden ser publicados o presentaron una información distinta a los organismos científicos, la identidad de su hijo de ninguna manera será revelado.

En el caso de que usted tiene preguntas o necesita información adicional, puede ponerse en contacto conmigo: Jeffrey Mihlon, Universidad Nacional-Louis, 1000 Capital Drive, (847) 465-0575 o rdtch555@aol.com. Si usted tiene alguna inquietud o pregunta antes o durante la participación que sientes que no han sido abordados por mí, puede comunicarse con Susan McMahon, SMcmahon@nl.edu, 630-874-4323, o el presidente de la Junta de Revisión Institucional de Investigación de NLU:

Dr. Judith Viola, National Louis University, 122 South Michigan Avenue, Chicago, Illinois 60603; (312) -261-3527, email: judah.viola@nl.edu.

_____

Nombre del Padre o Tutor (Imprimir)

_____   _____

Firma del Padre o Tutor   Fecha

_____

Investigador (Imprimir)

_____   _____

Investigador Firma   Fecha