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The Effects Of Using Morphemic Analysis On Comprehension Of Unknown Academic Vocabulary

Jon Avery
Hamline University

THE EFFECTS OF USING MORPHEMIC ANALYSIS ON COMPREHENSION OF

UNKNOWN ACADEMIC VOCABULARY

By

Jon Stephen Avery

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Committee Members:
Primary Advisor: Michelle Benegas
Secondary Advisor: Megan Stecher
Peer Reader: Sindy Morales Garcia

Dedication

To my life partner, thank you for your steadfast belief in my greatness, empathy, and solidarity on the mountain tops and through the valleys. To my mother, thank you for seeing me as your 'diamond in the rough', being my first teacher, and reminding me how flowers that bloom late are worth the wait. To my father, thank you for proofreading countless essays, fostering the value of critical thinking, and being an example of resilience through struggle. To my spirit animal, thank you for your unique magic, healing energy, and unending loyalty. I could not have completed this journey without all of your contributions.

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Abstract:

Despite the vast amount of research on morphemes and literacy, examination of how morphemic analysis affects secondary language learners is limited. Morphemic analysis is the process of using common Latin and Greek prefixes, roots and suffixes to hypothesize the meaning of unknown vocabulary. The primary purpose of the research is to determine how morphemic analysis affects English learners ability to determine the meaning of unknown academic vocabulary in their high school advanced placement geography class. The secondary purpose of the study is to provide secondary teachers a tool to do something about the vocabulary gap they observe between native speakers of English and English learners. Many English learners struggle to access academic texts in their secondary classes while many teachers focus on tier three high impact vocabulary words from their respective content areas. Despite the best efforts of secondary educators, students are left dependent on their teachers for accessing academic texts. This study explores the possibility of teaching students how to teach themselves academic vocabulary by using morphemic analysis. The methodology of the intervention period explicitly teaches a group of students the eight most common prefixes, roots and suffixes from their classroom textbook. Data from a pretest, post-test, and exit survey are used to analyze the effects of morphemic analysis. Results from the study indicate that morphemic analysis aids students ability to comprehend unknown academic vocabulary however, variation of data implies that some participants found the method more helpful than other participants.

Chapter One: Introduction

I have been teaching high school students social studies and English language arts for about ten years in suburban, urban, charter, alternative and public educational environments. I've had classes as large as forty six and as small as two working in co-taught, mainstream, intervention, pull-out, flipped, and seminar course class structures. I've been a member of ESL, Social Studies, English and Science departments in two states and have never had the opportunity to teach a class more than two years. The hours have always been long with high emotional tolls along the way. The joy of spending my day with students, however, continues to fuel my passion for the field of secondary education. The common thread amongst my diverse teaching assignments has been my commitment to socially marginalized student populations.

I teach literacy intervention courses in a first ring suburban high school which are intended to give students the academic tools required to be successful throughout their high school career. My students continuously act as a source of positive energy, inspiration and joy. They come from diverse cultural and linguistic backgrounds including Southeast Asia (Vietnam, Cambodia, Laos); Latin America (Guatemala, México, El Salvador, Honduras) and Northeast Africa (Ethiopia, Somalia, Oromia). As a result of the opportunity gap, systematic social inequalities, and other factors outside of their own control, many of my students test significantly below grade level on multiple well known assessments such as the NWEA Measures of Academic Progress (MAP) and 8th Grade Minnesota Comprehensive Assessment (MCA). Most of my students are long term English Learners yet have been exited or are not served by our official ESL programs.

Our program is a tier two intervention course within Response to Intervention (RTI) that aligns to our 9th grade English Language Arts and AP Human Geography curriculum. The classes are capped at fifteen students and use one-to-one technology with the goal of seeing accelerated growth in their first year in high school. My intervention students gained more than two years of average growth averaging seven point increases in reading, and our building achieved a twelve-point jump on the MCA in English for our 10th grade students, many of whom I had the previous year.

Background for study

My journey with this topic began far before I knew I wanted to be a teacher. In fact, it started in with me struggling to learn how to read. I was exposed to literacy using the whole word strategy in a small central Minnesotan Lutheran elementary school. At least that is how they attempted to teach me how to read. Unfortunately, the method of learning to read made little sense to me, and looking back, I did everything I could avoid reading because I had internalized that I was bad at it.

I was clever, and when things didn't make sense to me, I found ways of getting out of it. My mother fondly recalls a story in which my concerned kindergarten teacher called home within the first month of the school year. Apparently, I was failing miserably, and my teacher inquired as to why I was refusing to participate in sight word activities and quizzes. When my mother discussed the matter with me later that day, a few revelations became clear. First, it was hard to stay focused in a busy classroom environment. Second, I had discovered that if I replied

that I didn't know the answer a few times in a row, I would be allowed to return to playing with the many fun possibilities the classroom and mini gym offered.

My mother eventually caught on that I was struggling, and started directing mini lessons at home using explicit phonics instruction in the same way she was taught as a child. My long journey in becoming literate was part of her inspiration in becoming a first grade teacher. From her perspective, I was not able to read independently until fourth grade. To this day, she reminds parents of struggling students in her first grade classroom, that if her ADHD and emotionally explosive son could learn how to read, their struggling student could too. I was her biggest challenge and her greatest triumph. She had discovered that I needed a hands-on rule-based method, and that I would never simply pick it up through exposure or passive learning. This is one of many stories that shaped my struggle to be a successful student and human being. It was because education was never easy for me that I decided to become a teacher and help the next generation of kids in schools who were struggling.

Upon graduating from college with a degree in social studies education, I began my teaching career in a wonderful, but very challenging urban high school in the midwest. I had become very committed to social justice efforts around race, gender, sexuality and economic inequality, and poured all of my energies into the position I had dreamed about in college. I arrived at work early, stayed late, and even snuck in through the windows on the weekends to make copies when I had not gotten everything done on Friday before when they kicked me out at 10pm. My sixth period class had forty six freshmen. I kept a blow up camping mat in my room for power naps. I was often exhausted, but established a strong rapport with my students. Three

of my students were even assistant ushers in my wedding years later. I loved all of my students and they loved me back.

More than two thirds of my students spoke a language other than English at home, and the remaining third spoke non-standardized forms of English not seen as legitimate by educational institutions. It became quickly apparent that my students could not ascertain relevant information from academic texts, and that I was not adequately equipped to help teach them how to do it. I knew what academic writing should look like, but I did not know how to teach them phrasal, sentence and paragraph structures. I knew how to read challenging texts, but I could not make explicit the strategies I used when I had a breakdown in my own comprehension. My first year felt like the students I loved, and who love me back, were drowning in dark ocean while I swam next to them, wanting to help, but helpless to do so. I did not know how to teach them the skills they needed, and some of them drowned in the sea of public education. Their faces still haunt me. Solidarity with students became a bit hollow as they moved beyond our year together still lacking the essential literacy skills they would need to be successful inside and outside of educational institutions.

Over the next few years, I went back to school at night, acquiring further education in the form of K-12 ESL and Reading licenses, in addition to pursuing Master's Degree in ESL Education. Through these experiences both personally and professionally, I have come to value explicit instruction that clearly lays out systems and structures surrounding concepts and systems. Too many students are expected to figure out the opaque structure of the English language, but are unable to do so. Furthermore, we as educators are too often ill-equipped to

explicitly teach the structures of English we are expecting our students to produce, which is one of the reasons this research has focused on morphemic analysis.

Within the sphere of secondary education, I daily observe my colleagues going out of their way to care for our students. Many the people I work with empathize with their students and work diligently to support their student's growth. The vast majority of the times, their students stay up late working on assignments, ask thoughtful questions, and wake up early to obtain extra help. Despite the best of intentions of teachers and students, the impact of all their hard work often falls short of college readiness standards and examinations.

In many schools, especially in linguistically, culturally, and economically diverse communities, students do not perform at grade level. I have observed that many of these students find themselves in extremely difficult life situations at very young ages because of historical and current social realities. As the literature review will show in chapter two, many of these students enter kindergarten behind their more privileged peers in the area of vocabulary comprehension, which is commonly known as the Matthew effect (Stanovich, 1986). To combat this, young children, often from historically marginalized backgrounds, are often placed in well intentioned, yet sometimes stigmatizing intervention courses to close the gaps in early literacy achievement. The course goals often revolve around a desire to accelerate literacy skills and bolster school wide achievement reports (Vaughn & Fletcher, 2012).

Purpose of Study and Research Question

Many educators who place themselves at the center of educating students from marginalized backgrounds at the secondary level, encounter feelings of deflation or

discouragement from time to time (Wendt, 2013). As a language specialist working with social studies content teachers, it is common to encounter colleagues who were originally trained in teaching their field of study such as history, who struggle to teach the language structures of their field. The job of mainstream content teachers has shifted from teaching the content of their field, to teaching the language skills needed to access the content of their field. In these situations, classroom rigor is sometimes lost as students do not have the literacy skills required to access academic texts, produce collegiate writing and engage in multifaceted discussions on the secondary level. Making matters worse, content trained educators often lack the skills to facilitate the acquisition of language skills our students need. This gap between the content expertise of many educators and the literacy needs of diverse student populations needs to be addressed in a meaningful way. Additionally, significant paradigm shifts towards academic literacy standards further require instructors to be explicit around literacy instruction in secondary high school classes (Biancarosa, 2012).

Morphemic analysis is a promising field of study that may help to bridge the gap between how educators were trained to facilitate on content and how they must also now teach the skills required to access the content. Morphemic analysis is the practice of using common Latin and Greek prefixes, roots and suffixes to gain insight into the meaning of a word. Morphemic analysis research has shown promising possibilities for diverse student populations and may provide much needed guidance for educators shifting from the content to the skill paradigm of secondary education (Ferguson, 2006). Morphemic analysis may prove a useful tool that assists both teachers and students in gaining further access to academic vocabulary for the many challenging secondary texts common in today's curriculum (Reed, 2008).

It is for these reasons that I have decided to research the following question: How does using morphemic analysis affect students' ability to comprehend unknown academic vocabulary in a diverse Midwestern high school? To shed light on this question, students will participate in an intervention study where they will learn common morphemes that have a high frequency in their AP Human Geography curriculum. The intervention period will include a pre and post-assessment that will measure student's ability to determine the meaning of unknown academic vocabulary words using the vocabulary strategy of analyzing morphemes.

While it will not be within the scope of this study, I also wonder how morphemic analysis implementation throughout mainstream classes could be a tool in helping students attain higher levels of comprehension of unknown academic vocabulary words. In the diverse high school where I work, I wonder how morphemic analysis tools could uniquely benefit language learning students and how it could benefit students outside of my school in other learning institutions. If the implementation of morphemic analysis interventions can add to the growing body of research that supports the field, perhaps morphemic analysis could be an additional tool to reduce inequality in our education systems. Personally, I am excited about morphemic analysis because it could ultimately help vast amounts of student's access the academic English that is a gatekeeper of opportunities.

Summary

This chapter has discussed both my personal and professional background regarding how I became interested in this field of study. Additionally, it has hypothesized both an audience of secondary educators who may be interested this study, and recipients who may benefit from the

results of this study. Lastly, it has summarized both the research question and briefly previewed

methodology that will be taken. Chapter Two will summarize previous research on the

background, challenges and best practices in acquiring academic vocabulary. It will additionally

provide an overview of morphemic analysis and explain the study's research gap. Chapter Three

will include a detailed description of the methodology that will guide this study. Chapter Four

will report the results of the study. Chapter Five will incorporate a reflection on the collected

data in addition to the study's limitations, implications and suggestions for subsequent research.

Chapter Two: Literature Review

The purpose of this study is to answer the following question: How does using morphemic analysis affect students' ability to comprehend unknown academic vocabulary in a diverse Midwestern high school? The literature review will explore five areas: First, it will provide relevant background information about vocabulary acquisition; second, it will review the challenges adolescents face in acquiring academic vocabulary; third, the review will summarize current vocabulary best practices in regards to psychological environment and instructional methods; fourth, the chapter will summarize how the use of morphemic analysis affects students vocabulary; lastly, it will identify and explain this study's research niche.

Background

Historically, vocabulary acquisition has relied on wide independent reading and rote memorization of new words to increase vocabulary knowledge. Herman and Anderson (1984) have postulated that vocabulary is most commonly acquired through these two methods. As our educational systems have become more data driven, they have ascertained that vocabulary is commonly broken into three tiers containing basic, multiple meaning, and context specific vocabulary (Beck et al., 2002). Many students have fallen short academically because of their inability to comprehend and apply vocabulary that is classified into the less common and more context specific second and third tiers of vocabulary (Fang & Schleppegrell, 2010). This study will go beyond the difficulty of words and focus on the how learning the parts of words, known as morphemes, may affect vocabulary comprehension of tier two and three vocabulary, also known as academic vocabulary (Fang & Schleppegrell, 2010).

One of the reasons that students have had difficulty with academic vocabulary is that the English language itself is highly complex. Ebbers and Denton (2008) have gone so far as to call English "a mongrel mix of Latin, Greek and German". The complex sociopolitical history of English has created a modern day language with significant irregularity both phonetically and morphologically (Ebbers & Denton, 2008). Furthermore, Chall (1983) has asserted that there is a long recognized shift in the US educational system after the third grade in which students stop learning to read and start reading to learn. Problems arise for students as the complexity of texts increase while students are not systematically taught how to attend to the increasingly complex grammar, sentence structures, and removal of comprehension scaffolding devices in secondary texts (Fang & Schleppegrell, 2010).

Given these previously mentioned realities, along with other linguistic, historic and socio economic factors, an alarming number of secondary students possess insufficient literacy skills to be successful in high school and in their post-secondary endeavors (Fang & Schleppegrell, 2010). More specifically, many students lack the ability to sufficiently comprehend difficult texts, communicate socially in academic contexts, and communicate electronically in appropriate and meaningful ways (Wendt, 2013).

Unfortunately, the educational system in the United States was not created to alter the reality of students who fall behind, or enter the educational system already behind. In 1986, Stanovich coined the terms of the Matthew Effect, which simply states that the rich will get richer and the poor get poorer. The Matthew Effect essentially describes the experience of many students in regards to learning vocabulary and how it requires vocabulary to learn vocabulary.

The larger the bank of academic vocabulary a student has, the more resources they have to be able to acquire further academic vocabulary (Stanovich, 1986).

The reverse is also true. If a student enters elementary school below grade level, her/his ability to exponentially grow her/his vocabulary will be significantly reduced (Stanovich, 1986). The gap only grows between this normative group and their advantaged peers over time (Biemiller & Slonim, 2001). Part of the reason the gap grows is because in many cases, it takes vocabulary knowledge to ascertain additional vocabulary knowledge when the primary lever for acquisition is through wide reading. When students fail to understand even a few words in a sentence, comprehension is significantly impeded and their ability to gain multiple meaningful experiences with new vocabulary is lost (Ebbers & Denton, 2008).

Vocabulary acquisition is worthy of study not only because many students do not have an adequate vocabulary to access academic English, but also because the problem does not have a quick or simple solution (Ebbers & Denton, 2008). Rather, many scholars argue that the best path forward is one that includes a variety of best practices and strategies (Vaughn & Roberts, 2007).

The acquisition of vocabulary has been furthered by the work of Biancarosa (2012), who has shown that the issue must not solely focus on scaffolding down to those students that have been left behind. The study and implementation of best practices must focus not only on remediation, but also focus on the skills that students will need to be successful in their career and college landscapes. Students must learn to organize ideas, apply background knowledge, understand various contexts, research efficiently, and adjust their own during reading strategies to monitor their comprehension as needed .

For educators, this requires a significant paradigm shift. Vocabulary is the core of literacy, and yet is often isolated and not taught in content areas (Fisher & Frey, 2014). Secondary educators need to expand their traditional understanding of a content based pedagogy in order to include their new role as experts in teaching the language of their content.

Challenges

As the shift from learning to read to reading to learn, cements itself in middle school, students face three major challenges. According to Biancarosa (2012), they must first master increasingly difficult and varied texts. Texts increase in length while multimorphemic vocabulary not only becomes more common, but essential for understanding premises being presented. The grammar becomes more advanced and students must understand compound complex structures. Amidst the increasing demands of academic texts, supports that were once common in primary grades such as pictures and simple sentence structures, have become less common (Lee & Spratley, 2010). Students are asked to complete tasks and activities based off of their reading comprehension, which requires internalizing and synthesizing what they have read (Biancarosa, 2012).

Secondly, students must tackle the challenge of vocabulary in multiple content areas (Biancarosa, 2012). Often, words can have multiple meanings that change significantly depending on the class in which they are used (Lee & Spratley, 2010). Different subjects measure different types of evidence. For example, a history class allows character traits as evidence for the cause of an event, while a science class would not allow such evidence to be characterized as valid or acceptable. It is because of these complexities that Berman and

Biancarosa (2005) have argued that secondary and content area teachers must pay attention to their own content area literacy and vocabulary.

The last significant challenge that students face is that of navigating the world of digital literacy. By default, adolescents read almost exclusively online and digital content (Patel, 2007). Furthermore, the vast amount of text available to students online, while wonderful in many ways, can also be overwhelming for students to navigate. Patel (2007) has argued that the mental energy that is required to critically consume content adds another layer of literacy demands. Some educational scholars have argued that reduced efficiency when reading digitally is a new reality (Reinking, 1988).

Despite these aforementioned challenges that many students are facing, the Common Core Learning Standards (CCLS) have positioned themselves as a partial solution. Wendt (2005) has stated that the CCLS have framed literacy as a shared initiative for all teachers. The standards encourage inquiry, critical thinking, and evaluation of evidence. Furthermore, they require students to appreciate new perspectives and cultures, and use technology effectively and efficiently. These higher order thinking skills from the CCLS align with some of the best practices for vocabulary acquisition such as discussion (Vaughn et al., 2000) and questioning techniques (Jenkins & O'Connor, 2003) that will be discussed in the next subsection on best practices.

Best Practices

Research in this field has shown two major areas of study that contribute to positive acquisition of academic vocabulary that include school psychology and instructional methods. In

regards to school psychology and environment, researchers have commonly mentioned three themes. First, Main (2008) has argued that when students believe that success is a possibility and play an active role in defining what it means to be successful, their engagement increases exponentially. Feezell (2012) has echoed the idea that research has shown that when students have a choice in determining the books and vocabulary they learn, they learn more vocabulary because they are more likely to internalize and personalize the language .

Secondly, the idea that vocabulary must be given a context is a common theme. Fisher and Frey (2014) have put forth the idea that decontextualized situations have not proven to be effective nor of sufficient intensity to help students progress with academic vocabulary. Main (2008) has argued that engagement is closely connected to the how valuable the communication act and vocabulary are to the students everyday lived experience. Acquisition of academic vocabulary must be seen a part of their daily lives as opposed to something they only do in classrooms and schools.

Lastly, in regards to the psychological environment that must be created for students to acquire academic vocabulary, multiple opportunities for practice must be available, active, and meaningful (McKeown, Crosson, Artz, Sandora, & Beck, 2013). Active processing of new words must be incorporated if students are to have adequate and meaningful experiences in order to internalize and produce them in meaningful ways (Swanson & Hoskyn, 2001). These experienced must then be followed with detailed and immediate positive feedback (Main, 2008).

The second and vast area of research in acquiring academic vocabulary is that of instructional methods for teaching vocabulary. Research has shown four major instructional methods in U.S. American schools. The first and most common method is explicit vocabulary

instruction (Swanson, 1999). Swanson (1999) has explained that explicit instruction, when done well, includes a clear justification for learning, direct instruction of word meaning, modeling its use, opportunities for guided practice, and expectations of independent production . Stahl and Fairbanks (1986) have shown that this type of vocabulary instruction, when given adequate time, correlates with gains in reading comprehension . While this strategy can be helpful in gaining specific content tier three vocabulary, given the size and complexity of the English Language, it is improbable to teach every word that students will need to know to be successful with this method alone (Beck et al., 2002).

The second common and effective instructional method implemented in US American schools and beyond is that of wide reading (Sanden, 2012). Wide reading assumes a foundation of literacy, which allows students to encounter many new words in context and through multiple exposures to the words. Students internalize and eventually reproduce the new vocabulary. This is developmentally similar, if not a continuation, of how many people learn a language (Sanden, 2012). Mason, Stahl, Au, and Herman (2003) have concluded that if students read one hour per day, they would likely learn about 2250 words per year . This instructional method falls short at times when readers do not have the foundational vocabulary to understand the majority of the words written, or the text is outside of their zone of proximal development (Mountain, 2015).

An additional instructional method is cognitive and metacognitive word learning strategies, such as contextual and morphological analysis (Wong, Harris, Graham, & Butler, 2003). The purpose of these strategies is to help learners infer the meaning of unknown words using context clues and morphological clues (Fisher & Frey, 2014). Context clues, according to Nagy et al., (1985) can help readers solve unknown words through exposure in natural context

5% -11% of the time . However, this strategy may glean lesser results with diverse learners, which is a noted limitation of this instructional method (Baker et al., 1998).

Morphological analysis, offers a bit more promise to students, including diverse learners (Blachowicz & Fisher, 2000). In fact, Nagy and Anderson (1984) found that 60% of word meanings in printed school English in grades 3-9 can be predicted through their morphemes. This instructional method essentially teaches students to recognize and analyze Greek and Latin root words, in addition to prefixes and suffixes (Blachowicz & Fisher, 2000). The knowledge of the building blocks of language can significantly impact student's ability to determine the meaning of unknown words (Nagy & Anderson, 1984).

Researchers have suggested that inflectional suffixes be taught first (Anglin, 1993) followed by prefixes (White, Sowell, & Yanagihara, 1989). Next, derivational suffixes should follow as they are far more complex and can change the parts of speech (Singson et al., 2000). Lastly, Stahl (1999) argued that Greek and Latin should come last once the foundation of morphemic analysis has been built. It is noted also that Latin roots are not as consistent in their meaning as are Greek roots, which should be taken into consideration when decided on the instructional sequence (Stahl, 1999).

Wysocki and Jenkins (1987) have thus concluded that these two word solving strategies, contextual and morphological analysis, should be taught in conjunction with one another for greatest positive impact. When the Nagy and Anderson (1984) study about context clues is combined with the Nagy et al. (1985) study about morphemic clues, students would be able to determine the meaning of unknown words up to 71% percent of the time. Baumann et al. (2002) found positive results with a group of fifth grades in a study. Ebbers and Denton (2008) coined

this as the "outside in strategy." First students look outside the word for context clues, then students look inside the word for morphemic clues and lastly reread the section. While promising, this strategy also has its limitations given the amount of time that must be invested to teach the many morphemes required participate in morphemic analysis (Mountain, 2015).

The last vocabulary instructional method encompasses both questioning and discussion techniques which promote active cognitive interaction with academic vocabulary (Vaughn et al., 2000). Jenkins and O'Connor (2003) also have found that promoting collaborative engagement in learning with opportunities for practice increases vocabulary acquisition. Wendt (2013) has also emphasized the importance of social learning. Strategies to support this include interactive out loud reading, text based discussions, games, and opinion stations (Jenkins & O'Connor, 2003). Wendt (2013) has argued that most learning is social, social interactions use vocabulary, and thus vocabulary learning should naturally be a social occasion. This last strategy combines the previous discussed explicit instruction and wide reading strategies. While effective, they also fall short of supporting students learning all the required words necessary to be successful in post-secondary education and beyond.

Ebbers and Denton (2008) have found that all of these strategies increase their effectiveness when implemented appropriately. The learning environment should be verbal; words should be meaningful and applicable. The rationale for learning should be clearly stated, modeling should be incorporated, multiple exposures provided and guided practice should be included to encourage an active student level of engagement. Furthermore, activities such as semantic sorting, strategic questioning and mnemonic devices, incorporating technology

whenever possible, can be implemented within any of the four aforementioned instructional

methods (Ebbers & Denton, 2008).

Morphemic Analysis

Previous research on morphemic analysis has shown benefits for students towards

increasing academic vocabulary, reading comprehension, and accuracy in spelling. In regards to

vocabulary, English learners especially benefit from a roots based approach, as vocabulary is the

core of literacy (Mountain, 2015). Bromley (2007) has noted that 60% of multisyllabic words

have a root or an affix that contributes to the meaning. Furthermore, gaps in vocabulary between

advantaged children and their normative peers have been well documented, but can be

ameliorated by grade six with accelerated learning of root words (Biemiller & Slonim, 2001).

Students who can decompose words into their most basic parts, on average, will learn between

two to three more words per day than if they did not (Edmonds et al., 2009).

Additionally, Mountain (2015) has shown that teaching students how to analyze and

deconstruct multimorphemic words has been shown to increase reading comprehension. Many

high level academics and native speakers use morphemes with an unconscious automaticity .

Champion (1997) has noted that many problems with reading disabilities with secondary

students stem more from comprehending morphology as opposed to phonology. Students can

decode the words, but often lack the skills and resources to understand what they are reading .

Morphemic analysis would help to address this skill gap (Mountain, 2015).

While wide reading is well documented towards increasing vocabulary, and by

association, comprehension, it has not always been effective with multimorphemic words, which

is where struggling secondary learners need the most support (Edmonds et al., 2009). Native Spanish speakers, the second most spoken language in the United States, would also greatly benefit from morphemic analysis given the many shared affixes between English and Spanish (Mountain, 2015). Many of the gaps present in how students currently acquire vocabulary and practice literacy could be reduced if students had the tools of morphemic analysis available to them.

Lastly, the research of Deacon and Bryant (2006) has shown that students who understand root words and affixes have more accurate spelling patterns than those who do not. Children as young as six have exhibited the relationship between morphological awareness and general spelling ability. Mountain (2015) has also noted spelling accuracy of unfamiliar words increases with morphemic awareness .

While morphemic analysis offers promising possibilities towards increasing literacy skills, Mountain (2015) has cautioned against its use as a silver bullet. Latin roots are not always consistent in their meaning. At times, words may appear to contain a morphemic root, when in fact, they do not. Morphemic analysis should be used as a helpful tool amongst many to increase the literacy skills of learners of academic English.

Research Gap

In light of this available research, a gap has emerged regarding how explicitly teaching morphological analysis affects secondary English learners' abilities to determine the meaning of unknown multimorphemic academic vocabulary in mainstream content areas. Previous studies have focused on teaching affixes and roots to native speakers (Nicol, Graves & Slater, 1984;

White, Sowell and Yanagihara, 1989) and elementary English learning students (Cook, 2016), but there is a gap in the data regarding the effects of teaching morphemic analysis to recently exited English learners who no longer qualify for English learning services but still struggle with Academic English in secondary content classes. This gap justifies why it is pertinent to further understand the degree to which this strategy could positively the aforementioned group of learners. Additionally, educators have a legal responsibility according to the Supreme Court's decision in Lau v Nichols (1974) to provide supplementary language instruction. Failure to do so would place the teacher and educational institution in violation of the civil rights act of 1964 (Lee and Spratley, 2010).

Research Question

The focus of this study will be to answer the following research question: How does using morphemic analysis affect students' ability to comprehend unknown academic vocabulary in a diverse Midwestern high school? I want to find out how the application of morphemic analysis skills may influence recently exited English learning high school student's ability to comprehend unfamiliar multimorphemic academic vocabulary from their mainstream ninth grade AP Human Geography course.

Summary

Chapter two reviewed relevant background information about vocabulary acquisition and challenges adolescents face while acquiring academic vocabulary. Additionally, it summarized current vocabulary best practices in regards to psychological environment and instructional

methods. It further explored how the use of morphemic analysis could affect student's

vocabulary acquisition and lastly explained the research niche of this study. Chapter three will

examine the paradigm of mixed methods research, report the data collection process, provide an

overview of the procedure taken, and explain how the data will be analyzed.

Chapter Three: Methodology

This study will examine the effect of students using of morphemic analysis as a strategy when encountering unknown vocabulary in their advanced placement human geography textbook. The study will specifically seek to answer how using morphemic analysis will affect students who have recently exited English learning programs in a diverse urban high school in the Midwest region of the United States.

Over a six lesson intervention period, specific high occurrence morphemes will be explicitly taught to a group of intervention students in a stand alone classroom. Technology, student collaboration, and various discussion strategies will be used to bolster student engagement with the content. Students will be given a pretest prior to the first intervention lesson and a post-test following the terminal intervention lesson. Additionally, students will provide feedback through a Google forms survey to increase the researcher's understanding regarding the efficacy, engagement, applicability, and emotional impact of the interventions.

This chapter will review the paradigm of mixed methods research used in this study. Additionally, it will summarize the setting, participants, and data collection techniques. Furthermore, it will provide an overview of the procedure taken including the pretest, intervention, post-test and student survey. Lastly, it will explain how the data will be analyzed incorporating verification of data and ethical considerations.

Mixed Methods Research Paradigm

The mixed method research paradigm draws from and is a combination of qualitative and quantitative research methods. The quantitative research method handles data that is measurable,

numerical and statistical in nature while the qualitative research method uses data that is more

descriptive, dynamic and based on the perspective of the study's participants (Merriam, 2009).

This study will be a form of applied research with the goal of finding a solution to the problem of

underdeveloped academic vocabulary in English learning ninth grade adolescents. The data

gathered on morphemic analysis' ability to increase student achievement may additionally

inform building curricular decisions.

The primary data that will be gathered for this study will be quantitative in nature. Both

the pretest and post-test assessment will obtain numerical data regarding students' ability to use

prefixes, root words and suffixes to comprehend unknown academic vocabulary. The secondary

data that will be collected is qualitative and will be collected through a student survey. The

survey will focus on questions regarding the study's efficacy, engagement, applicability, and

emotional impact. The research will be conducted in a high school classroom where the

researcher will be both a participant and observer in addition to being the one responsible for

data collection and analysis. The final analysis will be a combination of measurable and

descriptive data that will be derived from the study and its participants. The information that will

be gathered will strive to provide insight into how students' ability to apply morphemic analysis

will affect their comprehension of unknown academic vocabulary from an advanced placement

human geography textbook.

Data Collection

    Setting

The research conducted in this study will be completed in an diverse first ring suburban high school in the upper Midwest. The school is located in a mixed income working class neighborhood and has approximately 1200 students in grades nine through twelve. According to the Minnesota Department of Education, the school's population is comprised of approximately 41% Hispanic, 27% Caucasian, 19% Black or African American, 6% Asian, 5% Multi-Racial, and 2% Native American students. Roughly 14% of the student population is enrolled direct services for learning English and 18% of the population had an individualized education plan also known as an IEP. Around 62% of the student population received free or reduced meals while only 1% of were identified as homeless or highly mobile (2017).

In regards to academic performance, the Minnesota Department of Education recorded the school's state reading scores has shown significant increase over the past two years with an increase of 11%, yet still remained eleven points below the state average in reading. Graduation rates have also increased by approximately eleven percent over a period of five years going from approximately six points below the state's average to one point above the state's average. These positive trends around reading and graduation rates are dampened however, with a large gaps in achievement between the schools different population groups (2017).

The classroom setting for this study will be a tier two accelerated English intervention class for ninth grade students who were previously exited from English learning services but are not performing at grade level. The study cohort will be among approximately 30 students identified as needing additional support upon entering high school in ninth grade based on their

middle school state reading exam known as the Minnesota Comprehensive Assessment (MCA), the Measures of Academic Progress (MAP) exam, and middle school teacher recommendations.

Participants

Table 1 displays a summary of the students who will participate in the study from a ninth grade accelerated English intervention course. They all speak a language other than standardized academic English at home with Spanish being the most prevalent. The participants time in the United States will range from six to fifteen years. Participants' most recent scores on the MAP exam was between 204 to 219, which, according to table 2, means that they possess a proficiency range from fourth to eighth grade in reading (Northwest Evaluation Association, 2015).

Table 1: Demographics of Participants

Student Pseudonym	Home Language or Dialect	Length of time in U.S.	Birth Place	Best NWEA MAP Score
A	Somali	6 years	Somalia	217
B	Spanish	9 years	Mexico	224
C	Sinhalese	6 years	Sri Lanka	219
D	Hmong	15 years	Minnesota	225
E	Spanish	15 years	Minnesota	218
F	Spanish	8 years	Mexico	216
G	Spanish	7 years	Mexico	221
H	Spanish	8 years	Mexico	225
I	Spanish	15 years	Mexico	216
J	Lao	15 years	Wisconsin	222

Table 2: NWEA MAP Reading Norms

2015 READING Student Status Norms					
	Begin-Year		Mid-Year		End-Year	
Grade	Mean	SD	Mean	SD	Mean	SD
K	141.0	13.54	151.3	12.73	158.1	12.85
1	160.7	13.08	171.5	13.54	177.5	14.54
2	174.7	15.52	184.2	14.98	188.7	15.21
3	188.3	15.85	195.6	15.14	198.6	15.10
4	198.2	15.53	203.6	14.96	205.9	14.92
5	205.7	15.13	209.8	14.65	211.8	14.72
6	211.0	14.94	214.2	14.53	215.8	14.66
7	214.4	15.31	216.9	14.98	218.2	15.14
8	217.2	15.72	219.1	15.37	220.1	15.73
9	220.2	15.68	221.3	15.54	221.9	16.21
10	220.4	16.85	221.0	16.70	221.2	17.48
11	222.6	16.75	222.7	16.53	222.3	17.68

Northwest Evaluation Association (2015)

Data Collection Technique #1

The primary technique that will be used in this study is the use of an identical pre and post multiple choice assessment (See appendix A). Students will be provided a pretest at the beginning of the intervention to form a repository of baseline data prior to being exposed through classroom lessons to morphemic analysis. Over the intervention period, students will participate in lessons using technology, collaboration, and discussion which will provide practice and feedback while applying morphemic analysis to comprehend unknown academic vocabulary words. After the intervention period, students will be given a post-test that is identical to the pretest to limit variables for the data collected.

The multiple choice assessment will be created through an intentional process. To begin, the most common morphemes will be determined by referencing the work of Dr. Judith Wilde (2006) in which she published the thirty two most common prefixes, twenty seven most common roots, and twenty three most common suffixes of the English language. Additionally, a text analysis was conducted by the researcher for the eighth chapter of the participants Advanced Placement human geography textbook (Rubenstein, 2015). From that text analysis, the eight most commonly occuring prefixes, roots, and suffixes will be ascertained from the participants geography textbook.. The results will be referred to in table three, four and five in this chapter. The purpose of the text analysis will be informed by the field of functionalist linguistics which that seek to teach the language tools that students will need to be successful in their present situation (Schleppegrell, 2012). Lastly, a multiple choice assessment will be created using the twenty four most common morphemes identified in the text analysis which students will encounter in their geography textbook. Students will be required to apply their knowledge of

morphemes to assess their ability to use morphemic analysis in the authentic context of their geography textbook. The assessment can be viewed in appendix A and B.

Data Collection Technique #2

The auxiliary technique that will be used in this study is a student survey that will be administered using Google Forms. After first data collection technique has been completed, students will be given an opportunity to provide feedback about the efficacy of the study, their level of engagement during the intervention, their perception of the applicability of morphemic analysis in other content areas, and how they emotionally experienced the study.

Procedure

Pretest

A pretest will be administered prior to commencement of the intervention period. The purpose of the pretest will be to provide the researcher with baseline data that could be used to measure student growth after the intervention period. Participants in the study will complete the pretest during class time.

Intervention

The intervention will be conducted through six class lessons lasting approximately fifty minutes each over a two week period. Lessons will consist of the following segments: do now, mini-lesson, guided practice, independent practice and closure. Guided and independent practice segments will strive to reinforce learning and increase engagement through the varied use of technology, collaboration, questioning and discussion techniques. The interventions will target

students learning, practicing and applying the meaning of the most common morphemes in the students eighth chapter of their geography textbook which can be viewed in table three through six below.

Table 3 – Common Prefixes: Occurrences in chapter 8 of AP geography textbook
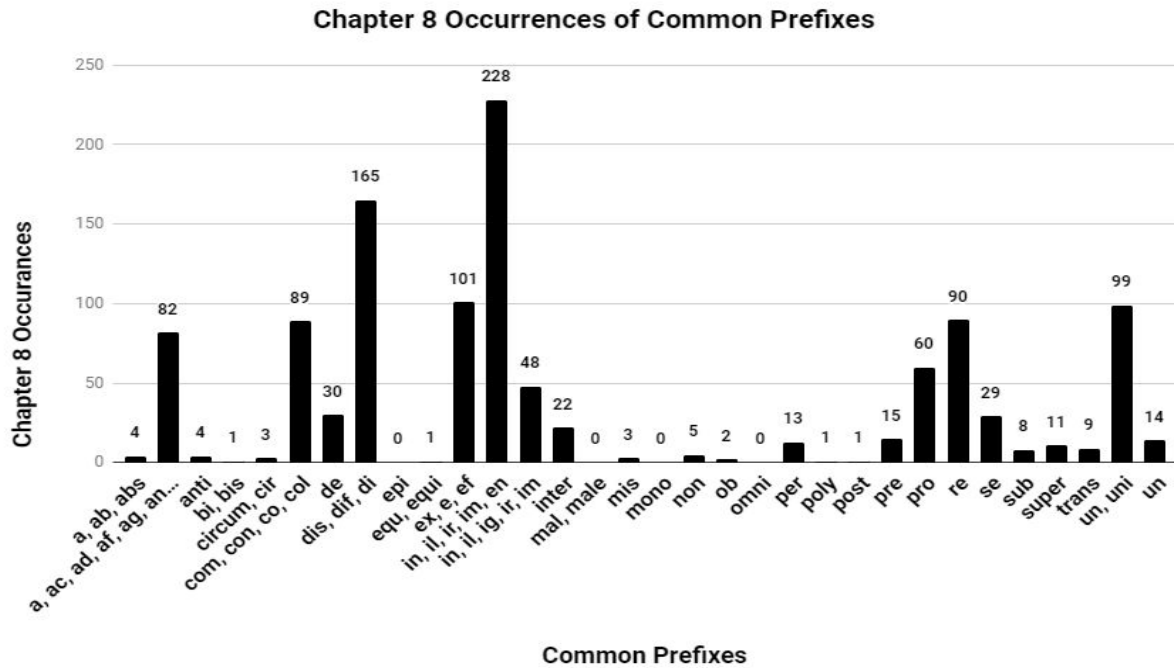
Table 4 – Common Prefixes: Meaning

Prefix	Meaning	Prefix	Meaning	Prefix	Meaning
a, ab, abs	away from	*in, il, ir, im, en*	into, within	*post*	after
a, ac, ad, af, ag, an, ap, ar, at, as	near	*in, il, ig, ir, im*	not	*pre*	before, earlier than
anit	against	*inter*	between, among	*pro*	forward, supporting
bi,bis	two	*mal, male*	bad, ill, wrong	*re*	back, again
circum, cir	around	*mis*	wrong, badly	*se*	apart
com, con, co, col	with, together	*mono*	one, alone, single	*sub*	under, less than
de	away from, opposite of	*non*	not, the reverse of	*super*	above, greater
dis, dif, di	apart, separate	*ob*	In front of, against	*trans*	across
epi	upon, on top of	*omni*	everywhere	*un, uni*	one
equ, equi	equal	*per*	through	*un*	not
ex, e, ef	out, from	*poly*	many		

Table 5 – Common Roots: Occurrences in chapter 8 of AP geography textbook

Chapter 8 Occurrences of Common Roots
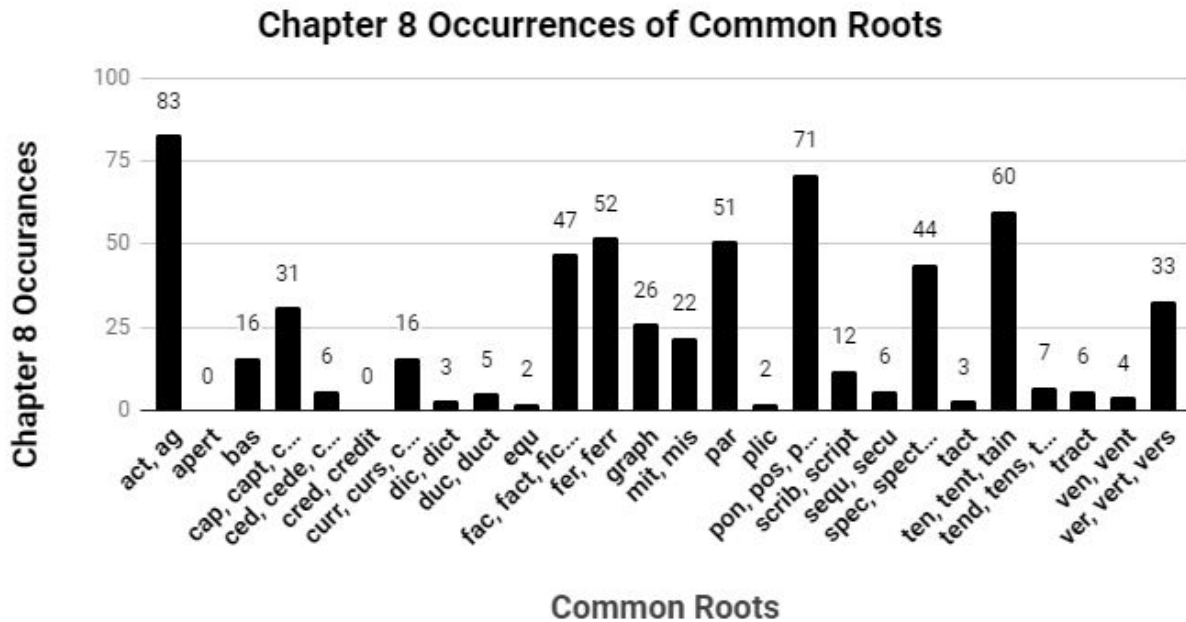
Table 6 – Common Roots: Meaning

Root	Meaning	Root	Meaning	Root	Meaning
act, ag	To do, to act	*equ*	equal, even	*sequ, secu*	to follow
apert	open	*fac, fact, fic, fect, fy*	to make, to do	*spec, spect, spic*	to appear, to look, to see
bas	low	*fer, ferr*	to carry, bring	*tact*	to touch
cap, capt, cip, cept, ceive	to take, to hold, to seize	*graph*	write	*ten, tent, tain*	to hold
ced, cede, ceed, cess	to go, to give in	*mit, mis*	to send	*tend, tens, tent*	to stretch
cred, credit	to believe	*par*	equal	*tract*	to draw
curr, curs, cours	to run	*plic*	to fold, to bend, to turn	*ven, vent*	to come
dic, dict	to say	*pon, pos, posit, pose*	to place	*ver, vert, vers*	to turn
duc, duct	to lead	*scrib, script*	to write		

Table 7 – Common Suffixes: Occurrences in chapter 8 of AP geography textbook

Chapter 8 Occurences of Common Suffixes
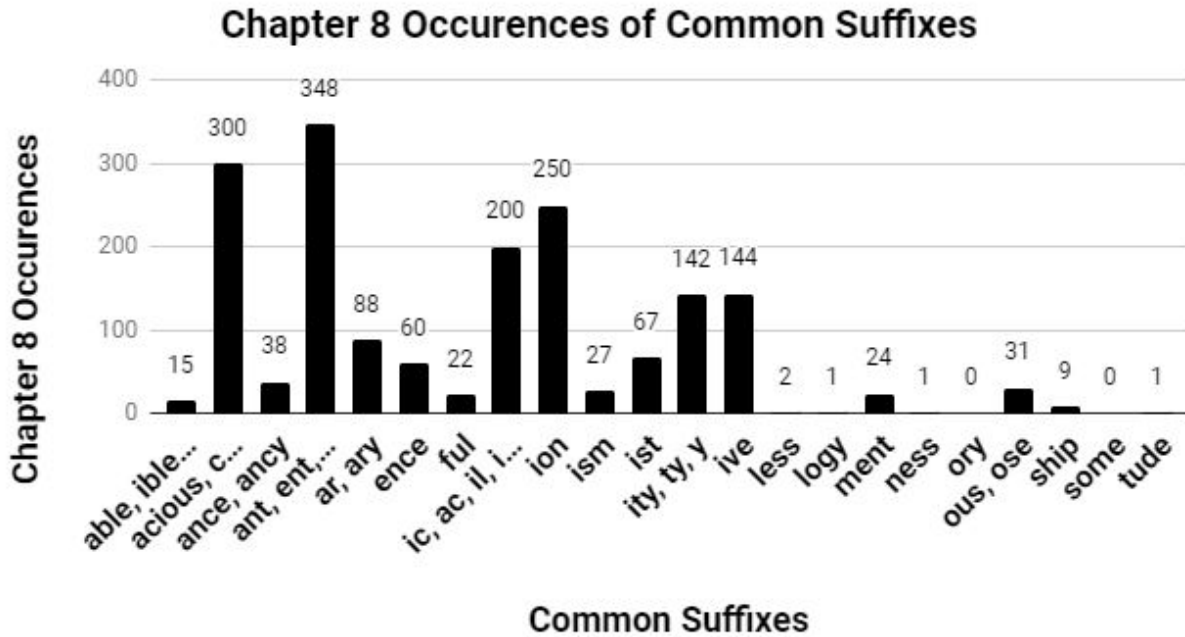
Table 8- Common Suffixes: Meaning

Prefix	Meaning	Prefix	Meaning	Prefix	Meaning
able, ible, ble	able to	*ion*	the act or condition of	*ment*	the act of, the state of
acious, cous, al	like, having the quality of	*ism*	the practice of, support of	*ness*	the quality of
ance, ancy	the act of, a state of being	*ist*	one who makes, does	*ory*	having the nature of, a place or thing for
ant, ent, er, or	one who	*ity, ty, y*	the state of, character of	*ous, ose*	full of, having
ar, ary	connected with, related to	*ive*	having the nature of	*ship*	the art or skill of, the ability to
ence	quality of, act of	*less*	lacking, without	*some*	full of, like
ful	full of	*logy*	the study of	*tude*	the state of quality of, the ability to
ic, ac, il, ile	of, like, pertaining to				

Post-test

A post-test will be administered to study participants after the intervention period has concluded. The post-test will be structurally identical to the pretest. The purpose of the post-test will be to ascertain if using morphemic analysis can positively impact students' ability to comprehend unknown academic vocabulary within the context of a challenging textbook that is above their average lexile range.

Survey

After the post-test will be administered in which students will provide feedback regarding their experience of the intervention. Its goal will be to measure students' experiences about the efficacy of the intervention, students' self assessment of their engagement during the intervention, students' perception of the applicability of morphemic analysis in other content areas such as social studies, and how they emotionally experienced the study.

Limitations

While this study can provide insight as to how morphemic analysis affects English learners ability to comprehend unknown academic vocabulary, it is important to name the limitations of this study. In the year of 2017, the rise of xenophobic political discourse may limit students ability to fully engage in school with fear of being deported or stigmatized daily. Additionally, students' home situations, social lives, previous school experiences and background knowledge also place limits on what this study can glean. Furthermore, the limitations of the researcher regarding classroom environment, curriculum planning, and daily lesson execution may also limit the efficacy of this study. Conversely, the positive relationships

the researchers and the participants, use of humor, small classroom environment, researchers attainment of three teaching licenses, and use of one to one technology may also positively impact the studies results in an irreplicable way.

Data Analysis

In order to provide insight on how students' use of morphemic analysis could impact their ability to comprehend unknown academic vocabulary words, students will need to participate in a pretest to establish a baseline, engage in intervention lessons to acquire the skill of analyzing morphemes, complete a post-test to provide comparative data, and reflect on their experience through a survey. Through the analysis of the pretest, post-test, and survey results, observations will be drawn regarding the instructional strength of the intervention lessons and the impact of using morphemic analysis as a tool for comprehending unknown academic vocabulary. The data will be from a limited sample size of approximately thirteen students and will be displayed in tables in chapter 4. The researcher will specifically note trends that showed improvements or regressions in participant performance during the intervention period. While conclusions will be tentative, statistically informed generalizations will be made regarding the impact of students using morphemic analysis to comprehend unknown academic vocabulary using quantitative and qualitative data derived from participants.

Verification of Data

Data will be accumulated using a triangulation method that will integrate three different research methods. Data will be verified by comparing data from students who participated in the studies interventions, students who did not participate in the studies interventions with similar

test skills and backgrounds, and a student survey reporting qualitative results. As both a participant and researcher in the study, the researcher will limit bias by employing mixed methodology, soliciting collegial feedback on assessments to increase data validity, and piloting the summative assessment with previous students and current colleagues.

Ethics

The following safeguards and protocols will be followed in order to uphold the rights of participants and to ensure that ethical standards for proper research are followed:

- Objectives of the research will be shared with all stakeholders including students, parents, colleagues, and school district officials.

- Written permission from parent/guardians will be secured with signed consent forms (See appendix 3)

- Appropriate permission procedures from both the participating school district and building administrators will be followed.

- All participants will be provided pseudonyms to protect their anonymity. No names will be used in the study that reveal the identity of the district, the school or the students.

- All data will be kept in a secure location with a password protected computer or in a locked desk drawer.

- All study participants will be allowed to opt out of the study without negative consequences.

Summary

This study will use a mixed methods research paradigm that will include both quantitative and qualitative data. Quantitative data will be collected and evaluated with a pretest and a post-test. Qualitative data will be compiled and analyzed with a student survey in order to measure students experience regarding the efficacy of the intervention, their engagement in the intervention, perceived applicability to other subjects, and emotional impact of the study. Chapter four will review results of the assessments, compare results of the assessments, and summarize responses from the student survey.

Chapter Four: Outcomes and Results

The research for this study was facilitated over a three week period in March, 2018. Ten students in a ninth grade high school reading intervention class participated in the research. The research sought to answer the question: How does using morphemic analysis affect students' ability to comprehend unknown academic vocabulary in a diverse Midwestern high school?

To answer this question, an in depth text analysis was conducted by the researcher of the participants' AP human geography textbook. The outcomes and results of the text analysis helped determine which morphemes occurred most frequently, which in turn increased the validity and applicability of the three week intervention period. Prior to the study, students completed a pre-test to provide baseline data. During the three week study, students memorized, discussed and applied the most common morphemes. At the conclusion of the study, students completed an identical morphemic analysis post-test and a survey to share their experiences.

Outcomes: Pre-test assessment

Students took a pre-test on prefixes, roots and suffixes (see appendix A). The pre-test included the meaning of all relevant morphemes from the study. Study participants then spent the following three weeks memorizing, discussing, and applying their knowledge of morphemes to unknown academic vocabulary from their AP human geography textbook. After the intervention period of three weeks, participants took the a post-test that was identical to the pre-test (see appendix A).

Table 9 - Pre-test outcomes: Individual students and questions

Student	Score	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
A	5	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
B	8	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
C	6	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
D	7	1	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
E	14	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1
F	9	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	1	0	1
G	14	1	1	1	1	1	0	1	1	1	0	0	1	0	0	0	0	1	1	0	0	1	0	1	1
H	12	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	1	1	0	1	0
I	9	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	0
J	8	1	0	1	1	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0
	Question	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
Total	%Correct	100	60	80	90	50	20	40	40	40	10	10	60	20	0	10	40	30	40	10	20	50	30	40	30

Table 10 - Pre-test outcomes: Percent of each question answered correctly

Pre-test: Percentage of each question answered correctly
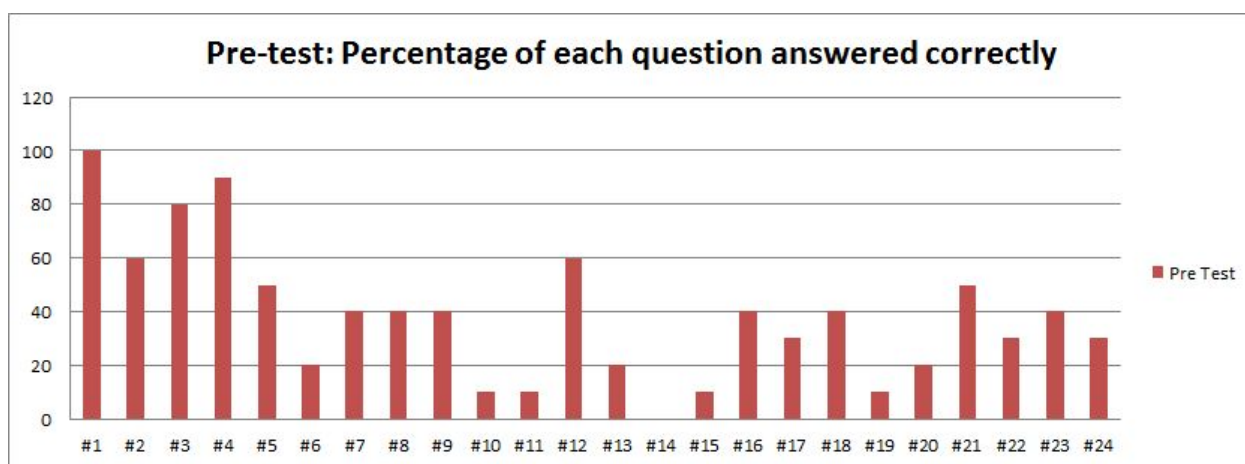
Pre-test data shown in table nine and table 10 indicated that students had a greater ability to answer questions that relied on prefixes. Questions one through eight were all heavily prefix dependent. Formative data also indicated that some of the participants had studied prefixes in the past but had stopped short of application in their previous learning environments. Pre-test data also indicated that students struggled the most with questions that were root word dependent on questions nine through 16. Formative data suggested that students struggled to identify the roots even when they had the definition for the root. Lastly, the pre-test results showed a slight overall increase the students ability to comprehend unknown vocabulary for suffixes when compared to roots as indicated by questions 17 to 24 which were suffix dependent.

Outcomes: Post-test assessment

After the three week intervention period, participants completed a post-test that was identical to the pre-test that had been completed prior to the intervention (see Appendix A). Post-test assessment results can be viewed in table 11 and table 12.

Table 11 - Post-test outcomes: Individual students and questions

Student	Total Score	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
A	16	1	0	1	1	1	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0	0
B	18	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0
C	14	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	1	0	0	0
D	22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
E	14	0	1	1	1	0	0	1	1	1	1	0	0	1	1	0	1	1	0	1	0	1	0	0	1
F	11	1	0	1	0	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1
G	19	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1
H	16	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	1	0	1	0	1	1	0	1	0
I	11	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	1	0
J	16	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	1	0	1	1	1	1	0	1	0
Test Question		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
% Correct		90	70	100	90	80	40	70	80	90	80	40	70	60	50	30	70	60	80	50	60	90	40	40	40

Table 12 - Post-Test outcomes: Percent of each question answered correctly
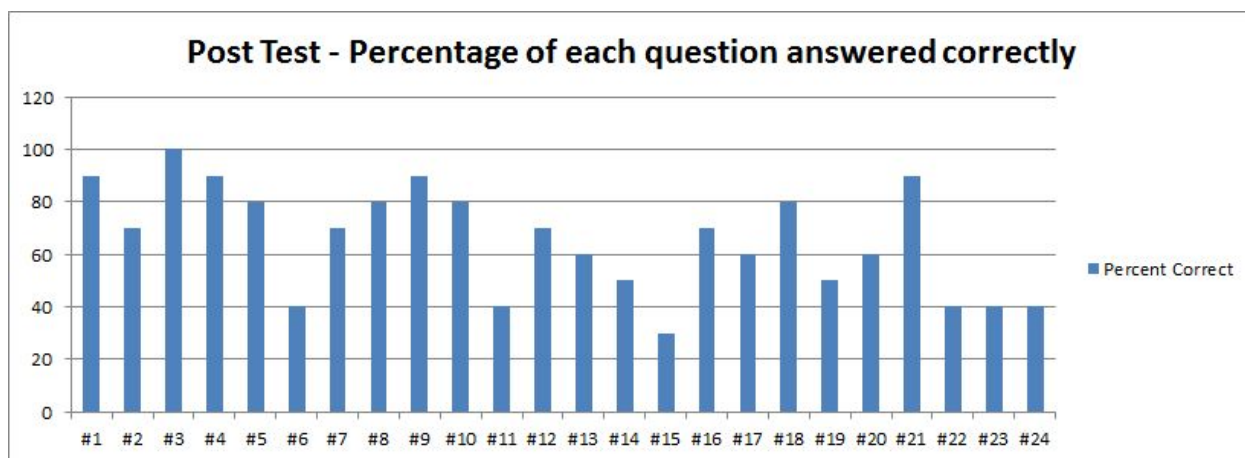
Post-test assessment results shown in table 11 and table 12 indicated varied success on the 24 test questions. The first eight questions, as previously discussed, were prefix focussed questions. The data suggested that students were most able to determine the meaning of

unknown vocabulary words when they used the knowledge of prefixes to help infer meaning.
Students successfully determined the meaning of unknown academic vocabulary 77.5 percent of the time when using prefixes. Questions nine through 16 were root dependent questions. Students successfully determined the meaning of unknown academic vocabulary 61.25 percent of the time. Questions 17 through 24 were suffix dependent. Students were able to determine the meaning of unknown vocabulary 57.5 percent of the time using their knowledge of suffixes.

Primary Result: Increased participant comprehension of vocabulary

The outcomes of the intervention period revealed that morphemic analysis increased participants' comprehension of unknown academic vocabulary in four ways. First, morphemic analysis increased participants ability to comprehend unknown academic vocabulary by an average growth rate of 27.5 percent. Most individual questions received a higher correct response rate as shown on table 13. Nine out of ten individual participants showed growth as shown in table 14. On average, each student increased her or his score by six and a half correctly answered questions out of a total score of 24 possible questions. The lowest increase was student "E" whose scores stayed the same while notably getting different questions correct on the pre-test than on the post-test. The most notable score increase in the study was that of student "D" whose correct answers increase from seven out of 24 on the pre-test to 22 out of 24 on the post-test for an increase of fifteen additional questions answered correctly.

Table 13 - Comparison of Pre-test and Post-test: Results by individual question

Average percentage of each question answered correctly
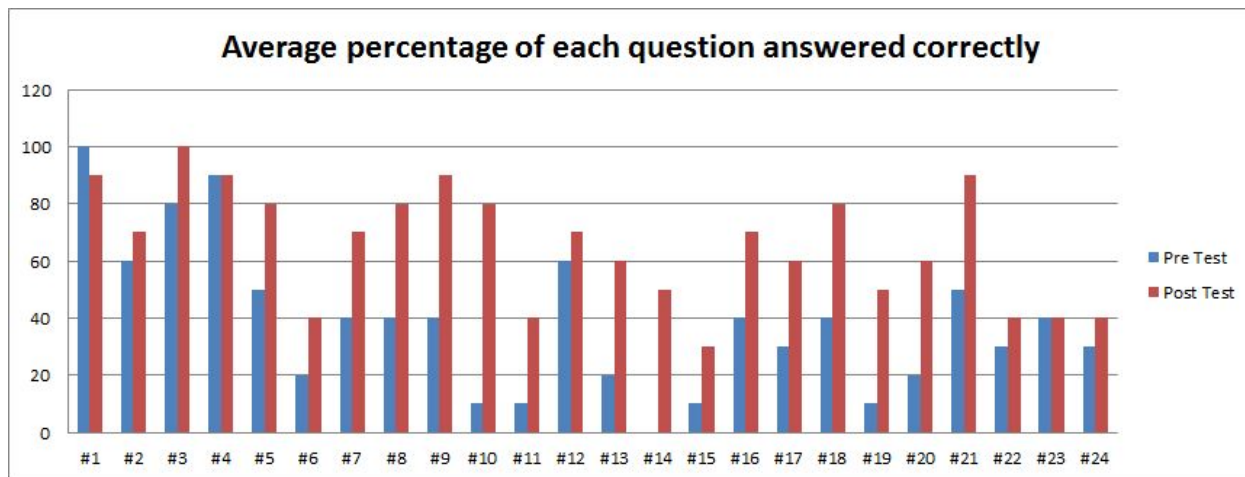
Table 14 - Pre-test and Post-test: Results comparison for individual students

Student	Pre	Post	Growth
Student A	5	16	11
Student B	8	18	10
Student C	6	14	8
Student D	7	22	15
Student E	14	14	0
Student F	9	11	2
Student G	14	19	5
Student H	12	16	4
Student I	9	11	2
Student J	8	16	8

Student Growth out of 24 questions
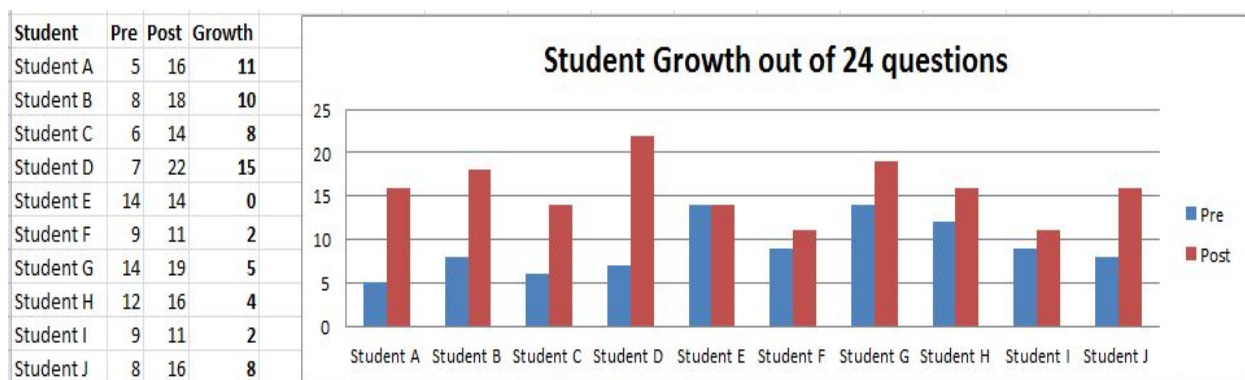
Second, morphemic analysis most increased participants' comprehension of root focussed questions. While participants did increase their correct response rate on prefix and suffix focussed questions, root focussed questions ascertained the largest rate of growth rate by jumping from 23.75 percent to 61.25 percent. This created a growth rate of 37.5 percent as shown in table 15. The increase in participants' ability to determine the meaning of an unknown words using common roots was notable. Students' ability to apply suffixes also grew at an accelerated pace of 26.25 percent followed by a prefix application growth rate of 17.5 percent.

Table 15 - Average percent correct: Prefixes, roots and suffixes

	Pre test	Post Test
Prefixes	60	77.5
Roots	23.75	61.25
Suffixes	31.25	57.5

Percent Correct: Prefixes, Roots, and Suffixes
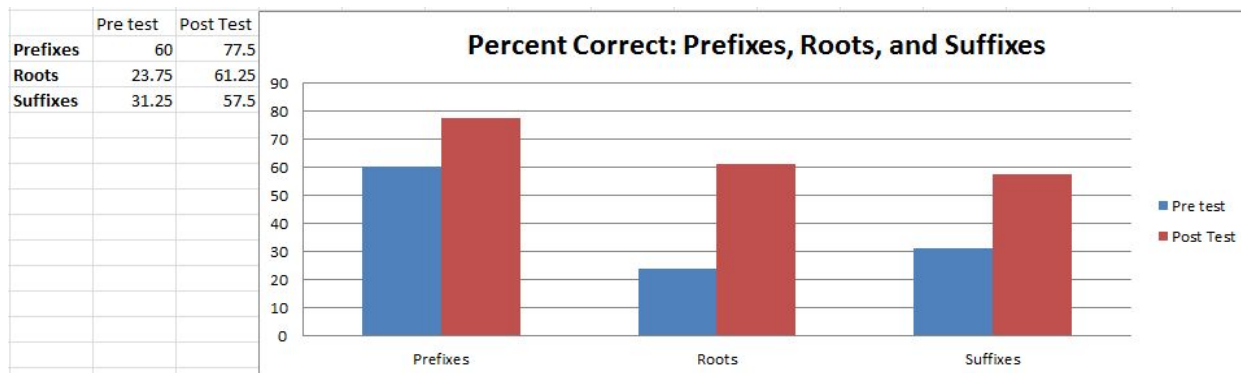
Third, morphemic analysis of prefixes increased participants' comprehension of unknown academic vocabulary significantly more than with other types of morphemes. Prefix focussed questions achieved a final average score of 77.5 percent, while root and suffix based questions achieved percents of 61.25 and 57.5 correct. Prefix focussed questions achieved a correct response rate of 16.25 percent higher than root focussed questions, and 20 percent higher than suffix focussed questions as shown on table 15.

Fourth, morphemic analysis most improved comprehension for participants who self identified as attentive during class or reviewed the material outside of class. Every student who answered agree or strongly agree to being attentive during the intervention period as shown on table 16, increased their correct application rate of morphemes by at least 16.6 percent as shown on table 14. Stated another way, these students increased their correct responses by four or more questions if they self identified as being attentive during the intervention period. Additionally, the 50 percent of participants who responded agree or strongly agree to reviewing materials outside of class time, posted higher average growth scores between the pre-test and post-test as shown in table 14 and table 17.

Table 16 - Survey: Student engagement with morphemes

Over the past three weeks, I paid very close attention while my teacher was teaching and while we were practicing how to use prefixes, roots and suffixes (morphemes).
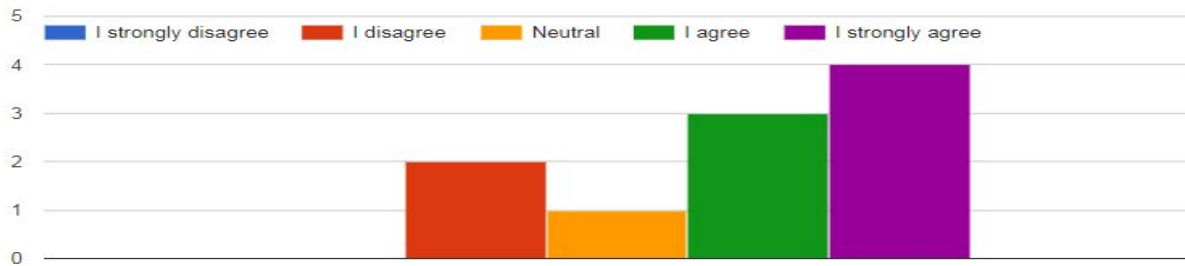
Table 17 - Survey: Student study habits

Over the past three weeks, I reviewed the meanings of prefixes, roots and suffixes (morphemes) outside of class to help me remember what I had learned.
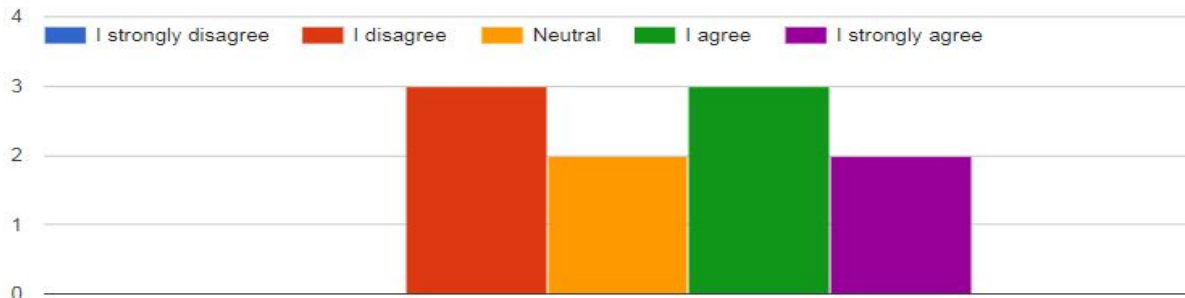
Secondary Result: Improvement in perception of abilities

The outcomes of the intervention period also revealed that morphemic analysis improved participants' perception of their ability to understand unknown academic vocabulary and complex texts in three ways. First, morphemic analysis helped the majority of participants believe that they could comprehend and apply the meaning of common prefixes, roots and suffixes to unknown academic vocabulary. Eight out of ten of the study's participants felt they comprehended the meaning of morphemes by the conclusion of the study as shown on table 18. In fact, 90 percent of participants reported either agreement or strong agreement that their ability to determine the meaning of unknown vocabulary had increased when they applied morphemic analysis as shown in table 19.

Table 18 - Survey: Comprehension of morphemes

The lessons over past three weeks helped me understand the meanings of the most common prefixes, roots and suffixes (morphemes).
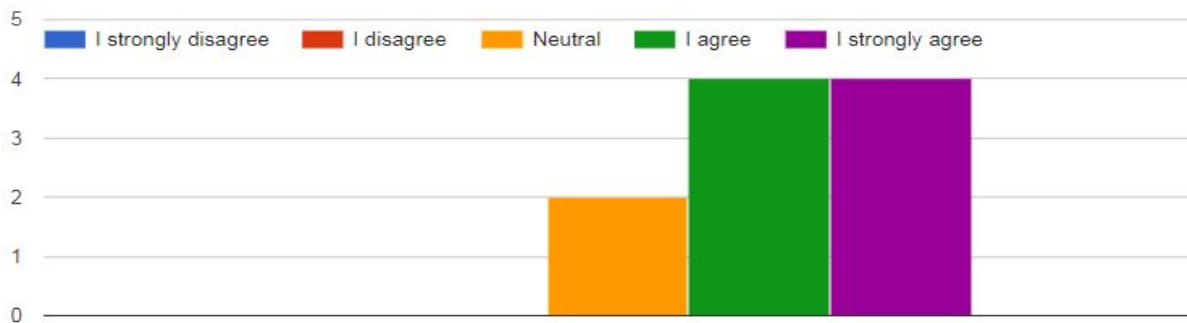
Table 19 - Survey: Application of morphemes

The lessons over past three weeks helped me learn how to apply (use) prefixes, roots, and suffixes (morphemes) to figure out words I might not know.
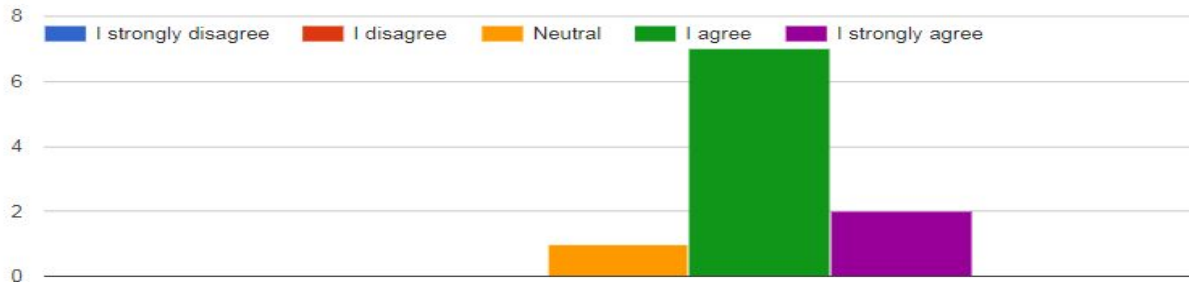
Second, morphemic analysis increased 90 percent of participants' belief in their ability to determine the meaning of unknown vocabulary as shown in table 20. Participants reported a strong opinion that using morphemes could help them determine the meaning of unknown academic vocabulary such as those encountered in their AP human geography class. It is noteworthy that many participants who posted low or no growth between assessments still believed that morphemic analysis could help them figure out words they were not familiar with.

Table 20 - Survey: Student perception of morpheme relevance

I believe that using prefixes, roots and suffixes (morphemes) in other classes such as AP Geography could help me figure out words I might not know.
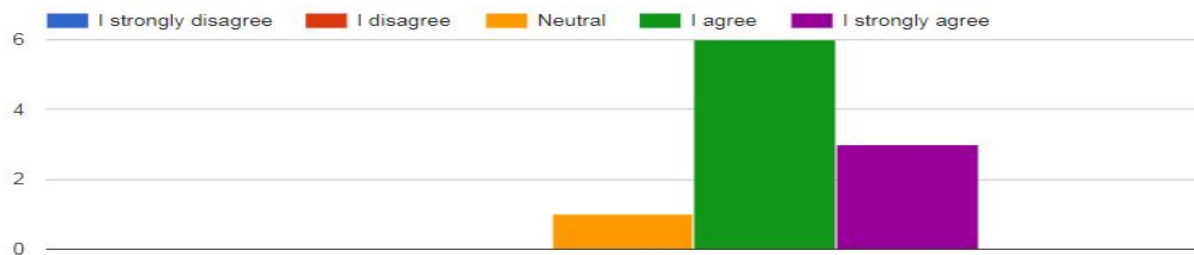
Third, morphemic analysis made 50 percent of participants feel more positive or encouraged about reading difficult texts in school as shown in table 21. While encouraging, it is also important to note that 30 percent of participants reported no change in attitude, and 20 percent reported disagree or strongly disagree to feeling more positive. Additionally, variables outside the scope of this study may have impacted participants responses regarding how they felt about reading difficult texts. As previously noted in chapter 3, participants in this study were part of a cohort of learners in which every student in their grade was enrolled in AP human geography. Some participants were initially resistant in the beginning of the school year, espousing a belief that being challenged at a college level was unfair as every 9th grader was enrolled in the program. Furthermore, of the responses regarding attitude towards challenging texts may additionally reflect past negative experiences reading a text above their reading level.

Table 21 - Survey: Student attitude towards challenging texts

The lessons about prefixes, roots, and suffixes (morphemes) made me feel more positive or encouraged about reading difficult texts like my AP Geography textbook.
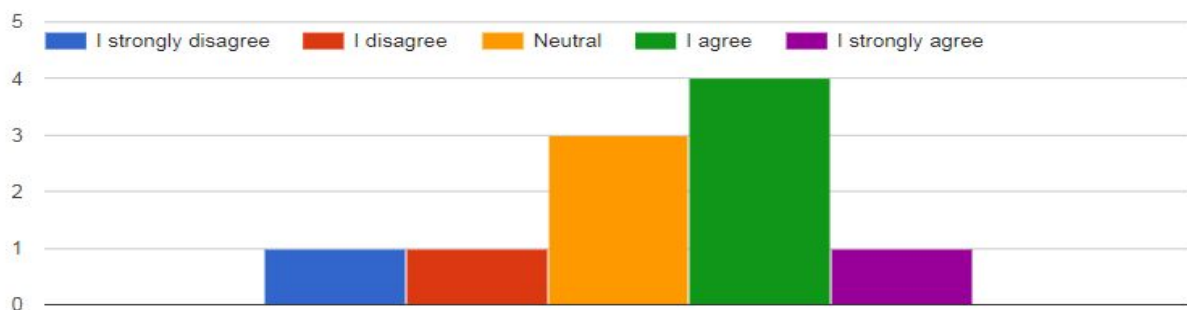
Summary of Results

Chapter four presented the outcomes and results of the intervention period. Outcomes growth between the pre-test and post-test showed an overall increased in success for most individual questions and nearly all individual participants Results showed that morphemic analysis affected students' ability to comprehend unknown academic vocabulary in two significant ways. Primarily, it increased participants' comprehension of unknown academic vocabulary and secondarily improved perceptions of their ability to understand unknown academic vocabulary and complex texts. Chapter five will analyze implications, review limitations, suggest avenues for further research, and summarize the major findings.

Chapter Five: Conclusions

The research in this study attempted to answer the following question: How does using morphemic analysis affect students' ability to comprehend unknown academic vocabulary in a diverse Midwestern high school? The concluding chapter explores the implications, reviews limitations, recommends future research questions, and summarizes the results of the study.

Implications of the Study

Several important implications resulted from this study. First, educators who integrate morphemic analysis into their curriculum may be well served by starting with prefixes and suffixes. Doing this would likely have the largest impact on student achievement while devoting the least amount of time when compared to teaching morphemic roots. Participants in this study had a significantly higher success rate with ascertaining the meaning of words that were prefix dependent than with words that were root or suffix dependent as discussed in chapter 4. According to previous studies, printed school English words with common prefixes and suffixes outnumber root words by almost four to one (White, Power, and White, 1989). These two data points indicate that while teaching common root words can significantly impact students ability to access academic language, a good place to start may be with prefixes and suffixes. Prefixes and suffixes are more common, result in a higher rate average rate of correct application, and are arguably easier for learners to identify given the location in the beginning or end of multisyllabic words.

Second, secondary teachers should increasingly embed morphemic analysis into core content classes to supplement all students ability to ascertain difficult vocabulary. Many students

are familiar with prefixes, roots, and suffixes, but also lack the ability to analyze morphemes to determine the meaning of unknown words. This study shows that when students shift from comprehension to application of morphemes, their ability to determine the meaning of academic vocabulary increases dramatically. This integration of morphemic analysis into core content areas would not only benefit English language learners, but many other types of learners as well.

Third, curriculum publishers should explicitly integrate morphemes into their textbooks in the same way they often highlight or bold important vocabulary. It is unrealistic for core content teachers to research, identify and apply morphemic analysis in their classrooms without it being fully integrated into the curriculum resources they use.

Fourth, teacher training programs, continuing education requirements, and professional development sessions should include morphemic analysis within their respective scopes. If teaching the language of the content area is a required paradigm shift in secondary education (Biancarosa, 2012), morphemic analysis training should be included for future teachers, especially secondary teachers in areas such as English language arts, math, science and social studies.

Limitations of the Study

Multiple factors limited the results of this study. One limitation of the study was that it contained a small number of only 10 participants. The limited number of participants makes it difficult to provide strong assertions regarding the applicability of the study to other contexts.

Another limitation was the time in which it was conducted. During the month of March 2018 in a northern region of the United States, multiple large snow storms reduced participant

attendance or canceled school all together. Additionally, in response to gun violence in other parts of the country, mass student protests led some participants to miss classroom instruction. Furthermore, some parents kept their children home from school in response to unsubstantiated threats of violence towards the school. This limited the results of the study by varying attendance data between participants, increasing the probability that students missed concepts, and varying the amount of practice participants received analyzing morphemes.

A third limitation was that only one chapter of one social studies textbook was used as the source for all of the measured multimorphemic vocabulary in the study. From that limited set, only 24 vocabulary words were measured for the results of this study. Furthermore, only non-fiction examples were used on the assessments as they were all taken directly from a geography textbook. The narrow breadth and genre of morphemes measured limits the possibility of broad conclusions.

Additionally, differing student test taking skills, academic stamina, prior experiences with morphemes, and reading levels were not taken into account when reporting data. Moreover, the impact of larger social realities on this study's results are difficult to account for. Fear of deportation, islamophobia, stress from economic struggles, and or living in a country whose president openly attacks communities with whom participants identify, are all possible examples of social factors impacting the results of this study. Furthermore, home life concerns such as diet, mental health, interrupted schooling, or feeling culturally disconnected from participants' home culture while engaging in the schools' dominant culture were not accounted for in this study and its results.

A final limitation relates to the fact that the application of morphemic analysis and how it affects students is difficult to measure. The study was able to measure the growth of students on an assessment that required students to apply their knowledge of morphemes, but the assessment tool cannot measure the countless other effects that the intervention period may have had on participants.

Recommendations for Future Research Questions

During this study, additional questions have arisen that are beyond the scope of this capstone. For example, how might morphemic analysis be taught in a more relevant way to include social justice issues, yet still focus on the target language of core content classrooms? Additionally, what would happen if foreign language teachers implemented morphemic analysis in classes such Spanish, French or German? It is possible that foreign language teachers are already implementing morphemic analysis, yet the way that academia is siloed by content limits the fields of second language, literacy and foreign language from extensive interaction. Furthermore, what would be the results of similar studies if they were conducted in secondary science or math classes? Lastly, how might morphemic analysis need to be taught differently when used for fiction short stories or novels commonly found in language arts classes? All of the previously listed questions and topics could add diversity and breathe to the research field of how morphemic analysis affects the fields of secondary education.

Conclusion

From the beginning of this study, I sought to record how teaching English learners who struggled to access academic texts would be affected by learning how to analyze morphemes. Prior to beginning the study, I assumed that teaching my students how to analyze morphemes would help their ability to read difficult texts. However, I anticipated the results would be modest at best. All of the research reviewed in chapter 2 suggested that morphemic analysis could be very helpful, yet many cautioned that it was not a silver bullet with which all literacy struggles could be addressed. At the conclusion of this study, I am astonished both by the large degree of success and the consistency with which the success was achieved. Participants' successful response rate between the pre-test and post-test was a shocking increase of 27.5 percent. Participants went from being able to determine the meaning of unknown vocabulary 38 percent of the time, to being able to determine the meaning slightly more than 65 percent of the time. While individual results varied, nearly every student grew with the exception of students "E" who achieved the same score twice.

Personally, I have run out of patience with social justice discourse that discusses the opportunity gap within education yet fails to offer meaningful research based strategies that can actually address the gap within my field of education. Morphemic analysis is more than an academic exercise for me, it is a way to act justly and lead by example. It is a chance for me to stop talking about the problem and start being a part of the solution.

Educationally, I believe that morphemic analysis could help shift the negative narrative surrounding many learners of English in which it is believed that these students simply cannot read academic texts. Perhaps if many of the implications discussed earlier in chapter 5 were

systematically implemented, the discouraging belief of "those students can't read that textbook" could shift a degree more positive to "they can't read that textbook YET".

Many twenty first century educators such as myself find ourselves in a losing battle in which we are expected to solve the many problems that plague our society such as poverty, racism and xenophobia, yet have so little control over the root causes of those aforementioned problems. At the same time, a dose of radical self reflection is also required in that there are actions we as educators can take that are within the locus of our control. There are practices that can have a real impact on the lives of the students we teach and on the culture in which we live. I believe there are glimmers of hope in sometimes mundane topics such as morphemic analysis. Paulo Freire (1972) once said that "the greatest humanistic and historical task of the oppressed was to liberate themselves." Perhaps exposing often marginalized students to academic texts through morphemic analysis is a way in which I can be an ally in supporting students' journey toward personal, communal, and societal liberation.

Appendix A: Pre-test and post-test assessment: Student version

Prefix Questions

Prefix	Meaning	Prefix	Meaning	Prefix	Meaning
a, ab, abs	away from	*in, il, ir, im, en*	into, within	*post*	after
a, ac, ad, af, ag, an, ap, ar, at, as	near	*in, il, ig, ir, im*	not	*pre*	before, earlier than
anti	against	*inter*	between, among	*pro*	forward, supporting
bi,bis	two	*mal, male*	bad, ill, wrong	*re*	back, again
circum, cir	around	*mis*	wrong, badly	*se*	apart
com, con, co, col	with, together	*mono*	one, alone, single	*sub*	under, less than
de	away from, opposite of	*non*	not, the reverse of	*super*	above, greater
dis, dif, di	apart, separate	*ob*	In front of, against	*trans*	across
epi	upon, on top of	*omni*	everywhere	*un, uni*	one
equ, equi	equal	*per*	through	*un*	not
ex, e, ef	out, from	*poly*	many		

Directions: Using the ***prefix*** morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Prefix Questions = #1-8:

1. *"The dictator took over the country that was **adjacent** to his northern border."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (a, ac, ad, af, ag, an, ap, ar, at as)
   a. Adjacent = the country that was far away from his northern border (boundary)
   b. Adjacent = the country was next to his northern border (boundary)
   c. Adjacent = the country was on the reverse side of his northern border (boundary)
   d. Adjacent = the country spying on him from the northern border (boundary)
   e. I do not know which of the above is best.

2. *"Saddam Hussein, the former ruler of Iraq, lived in a heavily fortified **compound** during the war against the United States in the 1990's."* Which of the following meanings would make the most sense using your knowledge of morphemes?

   (com, con, co, col)
   a. Compound = the place in which Saddam Hussein lived in was probably very small and had only one small building.
   b. Compound = the place in which Saddam Hussein lived was likely separated into small units to increase security and reduce attacks.
   c. Compound = the place in which Saddam Hussein lived was probably large and had multiple buildings closely linked or connected in some way.
   d. Compound = the place in which Saddam Hussein lived was likely underground and out of sight of spy planes from the United States.
   e. I do not know which of the above is best.

3. *"For many Muslims, the challenge has been to express disagreement with the policies (actions) of governments in the United States and Europe yet **disavow** the use of terrorism."* Which of the following meanings would make the most sense using your knowledge of morphemes?

   (dis, dif, di)
   a. Disavow = Muslims should refuse to use the word terrorism
   b. Disavow = Muslims should accuse the United States and Europe of also being terrorists.
   c. Disavow = Muslims should support the United States and Europe in creating distance between terrorists and citizens.
   d. Disavow = Muslims should stay away from and clearly show that they do not agree with the actions of terrorists.
   e. I do not know which of the above is best.

4. *"One of the main purposes of colonialism for Europeans was to **extract** useful resources in African and Asian countries"* Which of the following meaning would make the most sense using your knowledge of morphemes?

   (ex, e, ef)
   a. Extract = The purpose was to remove useful resources from Africa and Asia for Europeans to use.
   b. Extract = The purpose was to destroy useful resources in Africa and Asia so Europeans could not use them.
   c. Extract = The purpose was to grow additional resources from Africa and Asia for Europeans to use.
   d. Extract = The purpose was to reduce additional resources in Africa and Asia for Europeans could not use them.
   e. I do not know which of the above is best.

5. *"The majority of **inhabitants** of this area, known as Trans-Dniestria, are Ukrainian and Russian"* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (in, il, ir, im, en)
   a. Inhabitants = The people who travel outside of the area that is being referred to.
   b. Inhabitants = The people who live in the area that is being referred to.
   c. Inhabitants = The people who live near or around the area that is being referred to.
   d. Inhabitants = The people who are not allowed into the area that is being referred to.
   e. I do not know which of the above is best.

6. *"The absence of electricity in many parts of the country of North Korea hinders (makes difficult) the **promotion** of Democracy."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (pro)
   a. Promotion = The lack of electricity slows the destruction of democracy in North Korea.
   b. Promotion = The lack of electricity weakens the growth of democracy in North Korea.
   c. Promotion = The lack of electricity weakens those who are against democracy in North Korea.
   d. Promotion = The lack of electricity slows those who are desire to harm democracy in North Korea.
   e. I do not know which of the above is best.

7. *"Prolonged negotiations produced an agreement to degrade (reduce) Iran's nuclear capabilities in Western Asia providing the possibility of a better future of **reconciliation**"* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (Re)
   a. Reconciliation = The agreement created the possibility of the first war in Western Asia.
   b. Reconciliation = The agreement created the possibility of both sides having peace for the first time in world history.
   c. Reconciliation = The agreement created new hatred where it had not existed before.
   d. Reconciliation = The agreement is creating the possibility of both sides returning to a more peaceful way of life
   e. I do not know which of the above is best.

8. *"The Democratic system has replaced increasingly **irrelevant** monarchies (kings and queens) with elected governments that broaden individual rights and liberties."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (in, il, ig, ir, im)
   a. Irrelevant = Democracies have replaced monarchies that do not relate to the average citizen of the 21st century.
   b. Irrelevant = Democracies have replaced monarchies that are still very important to the average citizen of the 21st century.
   c. Irrelevant = Democracies have replaced monarchies, but the monarchies are still more reliable and significant to the average citizen of the 21st century.
   d. Irrelevant = Democracies have replaced monarchies that believed their Christian God had given them permission to rule over their citizens.
   e. I do not know which of the above is best.

Root Questions

Root	Meaning	Root	Meaning	Root	Meaning
act, ag	To do, to act	*equ*	equal, even	*sequ, secu*	to follow
apert	open	*fac, fact, fic, fect, fy*	to make, to do	*spec, spect, spic*	to appear, to look, to see
bas	low	*fer, ferr*	to carry, bring	*tact*	to touch
cap, capt, cip, cept, ceive	to take, to hold, to seize	*graph*	write	*ten, tent, tain*	to hold
ced, cede, ceed, cess	to go, to give in	*mit, mis*	to send	*tend, tens, tent*	to stretch
cred, credit	to believe	*par*	equal	*tract*	to draw
curr, curs, cours	to run	*plic*	to fold, to bend, to turn	*ven, vent*	to come
dic, dict	to say	*pon, pos, posit, pose*	to place	*ver, vert, vers*	to turn
duc, duct	to lead	*scrib, script*	to write		

Directions: Using the *root* morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Root Questions: #9-16:

9. *"The U.S. assertion that Iraq had weapons of mass destruction, as well as close links with terrorist groups, was refuted by most other countries, as well as ultimately by U.S. intelligence **agents**."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (act, ag)
   a. Agents = educational institutions that respond or participate for another person, group or organization
   b. Agents = businesses that respond or participate for another person, group or organization
   c. Agents = individuals that respond or participate for another person, group or organization
   d. Agents = organizations that respond or participate for another person, group or organization
   e. I do not know which of the above is best.

10. *"When Moldova changed from a Soviet republic back to an independent country in 1992, many Moldovans pushed for **reunification** with Romania, both to reunify the ethnic group and to improve the region's prospects for economic development."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(fac, fact, fic, fect, fy)
  a. Reunification = Moldovans pushed for the countries of Moldova and Romania to look forward to the first time both cultures could have peace.
  b. Reunification = Moldovans pushed for the countries of Moldova and Romania to look forward to a time when every culture would have its own country.
  c. Reunification = Moldovans pushed for the countries of Moldova and Romania to be brought back to a time when every culture had its own country.
  d. Reunification = Moldovans pushed for the countries of Moldova and Romania to be brought back together again as one country.
  e. I do not know which of the above is best.

11. *"Nonpartisan (neutral) employees of the United States legislature created the maps without **reference** to past election data."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(fer, ferr)
  a. Reference = Employees created new maps without using data from past elections.
  b. Reference = Employees created updated maps without using data from past elections.
  c. Reference = Employees created updated maps while using data from past elections to ensure accuracy.
  d. Reference = Employees created updated maps while predicting data for future elections to ensure accuracy.
  e. I do not know which of the above is best.

12. *"The most notable example of religion determining the boundaries of a nation-state was in South Asia, where the British **partitioned** India into the Hindu nation of India and the Islamic nation of Pakistan."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(Par)
  a. Partitioned = The British divided the area they controlled in Asia into separate parts to make it easier to control.
  b. Partitioned = The British added the areas of India and Pakistan in their quest to control as many religions as possible.
  c. Partitioned = The British abandoned the areas of India and Pakistan after discovering the difficulties of controlling multiple religions.
  d. Partitioned = The British increased the areas of India and Pakistan after learning more about the religions of Islam and Hinduism.
  e. I do not know which of the above is best.

13. *"Libya's long-time leader Muammar el-Qaddafi renounced terrorism in 2003 and provided compensation for victims of terrorism. However, his brutal attacks on protesters in 2011 eventually brought other nation-states of the world into active **opposition** with his leadership."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (pon, pos, posit, pose)
   a. Opposition = Myanmar's brutal attacks led other world leaders to remove support for those who were trying to end Myanmar's rule of Libya.
   b. Opposition = Myanmar's brutal attacks led other world leaders to actively support his leadership in Libya to defeat terrorism.
   c. Opposition = Myanmar's brutal attacks led other world leaders to increase their support of his leadership of Libya.
   d. Opposition = Myanmar's brutal attacks led other world leaders to remove their support of his leadership of Libya.
   e. I do not know which of the above is best.

14. *"While it was not a simple task, one of the major goals of Moldovans after the fall of the Soviet Union was to improve the region's **prospects** of economic development."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (spec, spect, spic)
   a. Prospects = one of the goals was to plan bring back businesses that had failed as a result of Soviet favoritism.
   b. Prospects = one of the goals was to learn from past business mistakes made by the Soviet Union.
   c. Prospects = one of the goals was to plan ahead for future business opportunities.
   d. Prospects = one of the goals was to improve the region's media, arts and literature networks.
   e. I do not know which of the above is best.

15. *"Iran has claimed that its nuclear program is for civilian and energy purposes, but other countries believe that Iran's stated **intentions** are not reliable sources of information."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (ten, tent, tain)
   a. Intention = Other countries believe that Iran is investing nuclear technologies that will not be worth the investment in the long term because they will not be reliable.
   b. Intention = Other countries believe that Iran is investing in nuclear technologies for reasons that Iran is not willing to admit publicly.
   c. Intention = Other countries believe that Iran is investing nuclear technology based on false research that will never lead to reliable energy solutions.
   d. Intention = Other countries believe that Iran is investing nuclear technology based on the assumption that nuclear technology will be the most efficient type of energy.
   e. I do not know which of the above is best.

16. *"In Yugoslavia, the breakup of the Soviet Union included a peaceful __conversion__ of Slovenia in 1991 from a republic in multinational Yugoslavia to a nation state"* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ver, vert, vers)

    a. Conversion = There was a demonstration that helped Slovenia believe that it should remain a nation state of Yugoslavia.

    b. Conversion = There was an undercover operation that allowed common Slovenians to continue using their freedom to be a multinational nation state.

    c. Conversion = There was a peaceful change process where Slovenians used their freedom to be a new nation state.

    d. Conversion = There was a peaceful protest movement that helped Slovenians resist the desire for change so they could remain a part of the multinational Yugoslavian nation state.

    e. I do not know which of the above is best.

Suffix Questions

Suffix	Meaning	Suffix	Meaning	Suffix	Meaning
able, ible, ble	able to	ion	the act or condition of	ment	the act of, the state of
acious, cous, al	like, having the quality of	ism	the practice of, support of	ness	the quality of
ance, ancy	the act of, a state of being	ist	one who makes, does	ory	having the nature of, a place or thing for
ant, ent, er, or	one who	ity, ty, y	the state of, character of	ous, ose	full of, having
ar, ary	connected with, related to	ive	having the nature of	ship	the art or skill of, the ability to
ence	quality of, act of	less	lacking, without	some	full of, like
ful	full of	logy	the study of	tude	the state of quality of, the ability to
ic, ac, il, ile	of, like, pertaining to				

Directions: Using the *suffix* morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Suffix Questions: #17-24:

17. *"Citing an agreement in 1935 between France and Italy, which then controlled much of Libya, Libya seized the Aouzou Strip in 1973. Chad regained control of the strip in 1987, and Libya withdrew its troops after the **International** Court of Justice ruled in favor of Chad's claim in 1994."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(acious, cous, al)
   a. International = A court that hears arguments inside countries.
   b. International = A court that hears arguments between countries.
   c. International = A court that hears arguments between continents.
   d. International = A court that hears arguments inside continents.
   e. I do not know which of the above is best.

18. *"In the name of protecting the principles of the revolution, the Committee of Public Safety, headed by Maximilien Robespierre, guillotined several thousand of its political **<u>opponents</u>**."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ant, ent, er, or)
    a. Opponent = Maximilien killed several thousand employees for the greater good of protecting the revolution of France.
    b. Opponent = Maximilien killed several thousand loyal soldiers for the greater good of protecting the revolution of France.
    c. Opponent = Maximilien killed several thousand challengers for the greater good of protecting the revolution of France.
    d. Opponent = Maximilien killed several thousand friends for the greater good of protecting the revolution of France.
    e. I do not know which of the above is best.

19. *"Timothy J. McVeigh was convicted and executed for the Oklahoma City bombing. For assisting McVeigh, Terry I. Nichols was convicted of conspiracy and **<u>involuntary</u>** manslaughter but not executed."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ar, ary)
    a. Involuntary = Nichols was found guilty of killing people without the desire or intent to kill people.
    b. Involuntary = Nichols was found guilty of killing people with the desire or intent to kill people.
    c. Involuntary = Nichols was found guilty of killing people who had volunteered to be murdered.
    d. Involuntary = Nichols was found guilty of killing people who wanted to kill him.
    e. I do not know which of the above is best.

20. *"The **<u>infantile</u>** military of Saddam Hussein was defeated within a few weeks after the Gulf War began in 1991."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ic, ac, il, ile)
    a. Infantile = a military that was old and not well equipped to defend itself.
    b. Infantile = a military that was young and not well equipped to defend itself.
    c. Infantile = a military that was out of shape and not well equipped to defend itself.
    d. Infantile = a military that was technologically superior but not well equipped to defend itself.
    e. I do not know which of the above is best.

21. *"Prior to the war, close-up spy photos of alleged munitions bunkers incorrectly labeled water trucks near the facilities as chemical **<u>decontamination</u>** trucks."* Which of the following meanings would make the most sense using your knowledge of morphemes? **(ion)**

   a. Decontamination = Trucks that helped destroy nearby munitions bunkers with their large amounts of artillery and rockets.
   b. Decontamination = Trucks that helped to pollute the environment through the heavy use of fossil fuels.
   c. Decontamination = Trucks that helped to add dangerous chemicals to the environment.
   d. Decontamination = Trucks that helped to remove dangerous chemicals from the environment.
   e. I do not know which of the above is best.

22. *"The Taliban, who gained power in Afghanistan in 1995, imposed strict Islamic **<u>fundamentalist</u>** laws on the population. Ironically, many Christians in the United States opposed the Taliban's rule also pushing for strict Christian fundamentalist laws"* Which of the following meanings would make the most sense using your knowledge of morphemes? **(ist)**

   a. Fundamentalist = basic laws that force people to follow rules set by a religion.
   b. Fundamentalist = complicated laws that force people to follow rules set by a religion.
   c. Fundamentalist = basic laws that encourage people to follow rules influenced by science and philosophy.
   d. Fundamentalist = complicated laws that encourage people to follow rules influenced by science and philosophy.
   e. I do not know which of the above is best.

23. *"**<u>Hostility</u>** between the United States and Iran dates from 1979, when a revolution forced abdication (removal) of Iran's pro-U.S. leader Mohammad Reza Pahlavi."* Which of the following meanings would make the most sense using your knowledge of morphemes? **(ity, ty, y)**

   a. Hostility = The relationship between Iran and the United States has been complicated since 1979.
   b. Hostility = The relationship between Iran and the United States has been friendly and kind since 1979.
   c. Hostility = The relationship between Iran and the United States has been unfriendly and mean since 1979.
   d. Hostility = The relationship between Iran and the United States has been distant but friendly since 1979.
   e. I do not know which of the above is best.

24. *"Some national governments are better able than others to provide the leadership needed to promote peace and prosperity. A **repressive** government's ability to respond is considerably different than a government who is not **repressive**."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ive)

    a. Repressive = A government who has limited human rights for its citizens in the past at least one time.

    b. Repressive = A government who consistently limits or takes away the human rights of its citizens.

    c. Repressive = A government who consistently provides human rights for its citizens.

    d. Repressive = A government who consistently encourages it citizens to exercise their human rights.

    e. I do not know which of the above is best.

Appendix B - Pre-test and post-test assessment: Teacher version

Prefix Questions

Prefix	Meaning	Prefix	Meaning	Prefix	Meaning
a, ab, abs	away from	*in, il, ir, im, en*	into, within	*post*	after
a, ac, ad, af, ag, an, ap, ar, at, as	near	*in, il, ig, ir, im*	not	*pre*	before, earlier than
anti	against	*inter*	between, among	*pro*	forward, supporting
bi,bis	two	*mal, male*	bad, ill, wrong	*re*	back, again
circum, cir	around	*mis*	wrong, badly	*se*	apart
com, con, co, col	with, together	*mono*	one, alone, single	*sub*	under, less than
de	away from, opposite of	*non*	not, the reverse of	*super*	above, greater
dis, dif, di	apart, separate	*ob*	In front of, against	*trans*	across
epi	upon, on top of	*omni*	everywhere	*un, uni*	one
equ, equi	equal	*per*	through	*un*	not
ex, e, ef	out, from	*poly*	many		

Directions: Using the ***prefix*** morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Prefix Questions = #1-8:

1. *"The dictator took over the country that was **adjacent** to his northern border."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (a, ac, ad, af, ag, an, ap, ar, at as)
   a. Adjacent = the country that was far away from his northern border (boundary)
   b. Adjacent = the country was next to his northern border (boundary)
   c. Adjacent = the country was on the reverse side of his northern border (boundary)
   d. Adjacent = the country spying on him from the northern border (boundary)
   e. I do not know which of the above is best.

2. *"Saddam Hussein, the former ruler of Iraq, lived in a heavily fortified **<u>compound</u>** during the war against the United States in the 1990's."* Which of the following meanings would make the most sense using your knowledge of morphemes?

> **(com, con, co, col)**

    a. Compound = the place in which Saddam Hussein lived in was probably very small and had only one small building.

    b. Compound = the place in which Saddam Hussein lived was likely separated into small units to increase security and reduce attacks.

    c. **Compound = the place in which Saddam Hussein lived was probably large and had multiple buildings closely linked or connected in some way.**

    d. Compound = the place in which Saddam Hussein lived was likely underground and out of sight of spy planes from the United States.

    e. I do not know which of the above is best.

3. *"For many Muslims, the challenge has been to express disagreement with the policies (actions) of governments in the United States and Europe yet **<u>disavow</u>** the use of terrorism."* Which of the following meanings would make the most sense using your knowledge of morphemes?

(dis, dif, di)

    a. Disavow = Muslims should refuse to use the word terrorism

    b. Disavow = Muslims should accuse the United States and Europe of also being terrorists.

    c. Disavow = Muslims should support the United States and Europe in creating distance between terrorists and citizens.

    d. **Disavow = Muslims should stay away from and clearly show that they do not agree with the actions of terrorists.**

    e. I do not know which of the above is best.

4. *"One of the main purposes of colonialism for Europeans was to **<u>extract</u>** useful resources in African and Asian countries"* Which of the following meaning would make the most sense using your knowledge of morphemes?

(ex, e, ef)

    a. **Extract = The purpose was to remove useful resources from Africa and Asia for Europeans to use.**

    b. Extract = The purpose was to destroy useful resources in Africa and Asia so Europeans could not use them.

    c. Extract = The purpose was to grow additional resources from Africa and Asia for Europeans to use.

    d. Extract = The purpose was to reduce additional resources in Africa and Asia for Europeans could not use them.

    e. I do not know which of the above is best.

5. *"The majority of **inhabitants** of this area, known as Trans-Dniestria, are Ukrainian and Russian"* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (in, il, ir, im, en)
   a. Inhabitants = The people who travel outside of the area that is being referred to.
   b. **Inhabitants = The people who live in the area that is being referred to.**
   c. Inhabitants = The people who live near or around the area that is being referred to.
   d. Inhabitants = The people who are not allowed into the area that is being referred to.
   e. I do not know which of the above is best

6. *"The absence of electricity in many parts of the country of North Korea hinders (makes difficult) the **promotion** of Democracy."* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (pro)
   a. Promotion = The lack of electricity slows the destruction of democracy in North Korea.
   b. **Promotion = The lack of electricity weakens the growth of democracy in North Korea.**
   c. Promotion = The lack of electricity weakens those who are against democracy in North Korea.
   d. Promotion = The lack of electricity slows those who are desire to harm democracy in North Korea.
   e. I do not know which of the above is best.

7. *"Prolonged negotiations produced an agreement to degrade (reduce) Iran's nuclear capabilities in Western Asia providing the possibility of a better future of **reconciliation**"* Which of the following meanings would make the most sense using your knowledge of morphemes?
   (Re)
   a. Reconciliation = The agreement created the possibility of the first war in Western Asia.
   b. Reconciliation = The agreement created the possibility of both sides having peace for the first time in world history.
   c. Reconciliation = The agreement created new hatred where it had not existed before.
   d. **Reconciliation = The agreement is creating the possibility of both sides returning to a more peaceful way of life**
   e. I do not know which of the above is best.

8. *"The Democratic system has replaced increasingly **irrelevant** monarchies (kings and queens) with elected governments that broaden individual rights and liberties."* Which of the following meanings would make the most sense using your knowledge of morphemes?

(in, il, ig, ir, im)

    a. **Irrelevant = Democracies have replaced monarchies that do not relate to the average citizen of the 21st century.**

    b. Irrelevant = Democracies have replaced monarchies that are still very important to the average citizen of the 21st century.

    c. Irrelevant = Democracies have replaced monarchies, but the monarchies are still more reliable and significant to the average citizen of the 21st century.

    d. Irrelevant = Democracies have replaced monarchies that believed their Christian God had given them permission to rule over their citizens.

    e. I do not know which of the above is best.

Root Questions

Root	Meaning	Root	Meaning	Root	Meaning
act, ag	To do, to act	*equ*	equal, even	*sequ, secu*	to follow
apert	open	*fac, fact, fic, fect, fy*	to make, to do	*spec, spect, spic*	to appear, to look, to see
bas	low	*fer, ferr*	to carry, bring	*tact*	to touch
cap, capt, cip, cept, ceive	to take, to hold, to seize	*graph*	write	*ten, tent, tain*	to hold
ced, cede, ceed, cess	to go, to give in	*mit, mis*	to send	*tend, tens, tent*	to stretch
cred, credit	to believe	*par*	equal	*tract*	to draw
curr, curs, cours	to run	*plic*	to fold, to bend, to turn	*ven, vent*	to come
dic, dict	to say	*pon, pos, posit, pose*	to place	*ver, vert, vers*	to turn
duc, duct	to lead	*scrib, script*	to write		

Directions: Using the *root* morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Root Questions: #9-16:

9. *"The U.S. assertion that Iraq had weapons of mass destruction, as well as close links with terrorist groups, was refuted by most other countries, as well as ultimately by U.S. intelligence **agents**."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(act, ag)
   a. Agents = educational institutions that respond or participate for another person, group or organization
   b. Agents = businesses that respond or participate for another person, group or organization
   c. **Agents = individuals that respond or participate for another person, group or organization**
   d. Agents = organizations that respond or participate for another person, group or organization
   e. I do not know which of the above is best.

10. *"When Moldova changed from a Soviet republic back to an independent country in 1992, many Moldovans pushed for __reunification__ with Romania, both to reunify the ethnic group and to improve the region's prospects for economic development."* Which of the following meanings would make the most sense using your knowledge of morphemes? **(fac, fact, fic, fect, fy)**
   a. Reunification = Moldovans pushed for the countries of Moldova and Romania to look forward to the first time both cultures could have peace.
   b. Reunification = Moldovans pushed for the countries of Moldova and Romania to look forward to a time when every culture would have its own country.
   c. Reunification = Moldovans pushed for the countries of Moldova and Romania to be brought back to a time when every culture had its own country.
   d. **Reunification = Moldovans pushed for the countries of Moldova and Romania to be brought back together again as one country.**
   e. I do not know which of the above is best.

11. *"Nonpartisan (neutral) employees of the United States legislature created the maps without __reference__ to past election data."* Which of the following meanings would make the most sense using your knowledge of morphemes? **(fer, ferr)**
   a. Reference = Employees created new maps without using data from past elections.
   b. **Reference = Employees created updated maps without using data from past elections.**
   c. Reference = Employees created updated maps while using data from past elections to ensure accuracy.
   d. Reference = Employees created updated maps while predicting data for future elections to ensure accuracy.
   e. I do not know which of the above is best.

12. *"The most notable example of religion determining the boundaries of a nation-state was in South Asia, where the British __partitioned__ India into the Hindu nation of India and the Islamic nation of Pakistan."* Which of the following meanings would make the most sense using your knowledge of morphemes? **(Par)**
   a. **Partitioned = The British divided the area they controlled in Asia into separate parts to make it easier to control.**
   b. Partitioned = The British added the areas of India and Pakistan in their quest to control as many religions as possible.
   c. Partitioned = The British abandoned the areas of India and Pakistan after discovering the difficulties of controlling multiple religions.
   d. Partitioned = The British increased the areas of India and Pakistan after learning more about the religions of Islam and Hinduism.
   e. I do not know which of the above is best.

13. *"Libya's long-time leader Muammar el-Qaddafi renounced terrorism in 2003 and provided compensation for victims of terrorism. However, his brutal attacks on protesters in 2011 eventually brought other nation-states of the world into active **opposition** with his leadership."* Which of the following meanings would make the most sense using your knowledge of morphemes?
    (pon, pos, posit, pose)
    a. Opposition = Myanmar's brutal attacks led other world leaders to remove support for those who were trying to end Myanmar's rule of Libya.
    b. Opposition = Myanmar's brutal attacks led other world leaders to actively support his leadership in Libya to defeat terrorism.
    c. Opposition = Myanmar's brutal attacks led other world leaders to increase their support of his leadership of Libya.
    d. Opposition = Myanmar's brutal attacks led other world leaders to remove their support of his leadership of Libya.
    e. I do not know which of the above is best.

14. *"While it was not a simple task, one of the major goals of Moldovans after the fall of the Soviet Union was to improve the region's **prospects** of economic development."* Which of the following meanings would make the most sense using your knowledge of morphemes?
    (spec, spect, spic)
    a. Prospects = one of the goals was to plan bring back businesses that had failed as a result of Soviet favoritism.
    b. Prospects = one of the goals was to learn from past business mistakes made by the Soviet Union.
    c. Prospects = one of the goals was to plan ahead for future business opportunities.
    d. Prospects = one of the goals was to improve the region's media, arts and literature networks.
    e. I do not know which of the above is best.

15. *"Iran has claimed that its nuclear program is for civilian and energy purposes, but other countries believe that Iran's stated **intentions** are not reliable sources of information."* Which of the following meanings would make the most sense using your knowledge of morphemes?**(ten, tent, tain)**
    a. <u>Intention</u> = Other countries believe that Iran is investing nuclear technologies that will not be worth the investment in the long term because they will not be reliable.
    b. <u>Intention</u> = Other countries believe that Iran is investing in nuclear technologies for reasons that Iran is not willing to admit publicly.
    c. <u>Intention</u> = Other countries believe that Iran is investing nuclear technology based on false research that will never lead to reliable energy solutions.
    d. <u>Intention</u> = Other countries believe that Iran is investing nuclear technology based on the assumption that nuclear technology will be the most efficient type of energy.
    e. I do not know which of the above is best.

16. *"In Yugoslavia, the breakup of the Soviet Union included a peaceful __conversion__ of Slovenia in 1991 from a republic in multinational Yugoslavia to a nation state"* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ver, vert, vers)
   a. Conversion = There was a demonstration that helped Slovenia believe that it should remain a nation state of Yugoslavia.
   b. Conversion = There was an undercover operation that allowed common Slovenians to continue using their freedom to be a multinational nation state.
   c. **Conversion = There was a peaceful change process where Slovenians used their freedom to be a new nation state.**
   d. Conversion = There was a peaceful protest movement that helped Slovenians resist the desire for change so they could remain a part of the multinational Yugoslavian nation state.
   e. I do not know which of the above is best.

Suffix Questions

Suffix	Meaning	Suffix	Meaning	Suffix	Meaning
able, ible, ble	able to	ion	the act or condition of	ment	the act of, the state of
acious, cous, al	like, having the quality of	ism	the practice of, support of	ness	the quality of
ance, ancy	the act of, a state of being	ist	one who makes, does	ory	having the nature of, a place or thing for
ant, ent, er, or	one who	ity, ty, y	the state of, character of	ous, ose	full of, having
ar, ary	connected with, related to	ive	having the nature of	ship	the art or skill of, the ability to
ence	quality of, act of	less	lacking, without	some	full of, like
ful	full of	logy	the study of	tude	the state of quality of, the ability to
ic, ac, il, ile	of, like, pertaining to				

Directions: Using the *suffix* morpheme chart above for reference, answer the below questions to the best of your ability. If you do not know the answer or don't have an educated guess, it's ok to answer "e" to communicate that you don't know the correct answer.

Suffix Questions: #17-24:

17. *"Citing an agreement in 1935 between France and Italy, which then controlled much of Libya, Libya seized the Aouzou Strip in 1973. Chad regained control of the strip in 1987, and Libya withdrew its troops after the __International__ Court of Justice ruled in favor of Chad's claim in 1994."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(acious, cous, al)
    a. International = A court that hears arguments inside countries.
    b. International = A court that hears arguments between countries.
    c. International = A court that hears arguments between continents.
    d. International = A court that hears arguments inside continents.
    e. I do not know which of the above is best.

18. *"In the name of protecting the principles of the revolution, the Committee of Public Safety, headed by Maximilien Robespierre, guillotined several thousand of its political <u>**opponents**</u>."* Which of the following meanings would make the most sense using your knowledge of morphemes?

(ant, ent, er, or)

    a. Opponent = Maximilien killed several thousand employees for the greater good of protecting the revolution of France.

    b. Opponent = Maximilien killed several thousand loyal soldiers for the greater good of protecting the revolution of France.

    c. Opponent = Maximilien killed several thousand challengers for the greater good of protecting the revolution of France.

    d. Opponent = Maximilien killed several thousand friends for the greater good of protecting the revolution of France.

    e. I do not know which of the above is best.

19. *"Timothy J. McVeigh was convicted and executed for the Oklahoma City bombing. For assisting McVeigh, Terry I. Nichols was convicted of conspiracy and <u>**involuntary**</u> manslaughter but not executed."* Which of the following meanings would make the most sense using your knowledge of morphemes?

(ar, ary)

    a. Involuntary = Nichols was found guilty of killing people without the desire or intent to kill people.

    b. Involuntary = Nichols was found guilty of killing people with the desire or intent to kill people.

    c. Involuntary = Nichols was found guilty of killing people who had volunteered to be murdered.

    d. Involuntary = Nichols was found guilty of killing people who wanted to kill him.

    e. I do not know which of the above is best.

20. *"The <u>**infantile**</u> military of Saddam Hussein was defeated within a few weeks after the Gulf War began in 1991."* Which of the following meanings would make the most sense using your knowledge of morphemes?

(ic, ac, il, ile)

    a. Infantile = a military that was old and not well equipped to defend itself.

    b. Infantile = a military that was young and not well equipped to defend itself.

    c. Infantile = a military that was out of shape and not well equipped to defend itself.

    d. Infantile = a military that was technologically superior but not well equipped to defend itself.

    e. I do not know which of the above is best.

21. *"Prior to the war, close-up spy photos of alleged munitions bunkers incorrectly labeled water trucks near the facilities as chemical **decontamination** trucks."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ion)
   a. Decontamination = Trucks that helped destroy nearby munitions bunkers with their large amounts of artillery and rockets.
   b. Decontamination = Trucks that helped to pollute the environment through the heavy use of fossil fuels.
   c. Decontamination = Trucks that helped to add dangerous chemicals to the environment.
   d. Decontamination = Trucks that helped to remove dangerous chemicals from the environment.
   e. I do not know which of the above is best.

22. *"The Taliban, who gained power in Afghanistan in 1995, imposed strict Islamic **fundamentalist** laws on the population. Ironically, many Christians in the United States opposed the Taliban's rule also pushing for strict Christian fundamentalist laws"* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ist)
   a. Fundamentalist = basic laws that force people to follow rules set by a religion.
   b. Fundamentalist = complicated laws that force people to follow rules set by a religion.
   c. Fundamentalist = basic laws that encourage people to follow rules influenced by science and philosophy.
   d. Fundamentalist = complicated laws that encourage people to follow rules influenced by science and philosophy.
   e. I do not know which of the above is best.

23. *"**Hostility** between the United States and Iran dates from 1979, when a revolution forced abdication (removal) of Iran's pro-U.S. leader Mohammad Reza Pahlavi."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ity, ty, y)
   a. Hostility = The relationship between Iran and the United States has been complicated since 1979.
   b. Hostility = The relationship between Iran and the United States has been friendly and kind since 1979.
   c. Hostility = The relationship between Iran and the United States has been unfriendly and mean since 1979.
   d. Hostility = The relationship between Iran and the United States has been distant but friendly since 1979.
   e. I do not know which of the above is best.

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24. *"Some national governments are better able than others to provide the leadership needed to promote peace and prosperity. A **repressive** government's ability to respond is considerably different than a government who is not **repressive**."* Which of the following meanings would make the most sense using your knowledge of morphemes?
(ive)

    a. Repressive = A government who has limited human rights for its citizens in the past at least one time.

    b. **Repressive = A government who consistently limits or takes away the human rights of its citizens.**

    c. Repressive = A government who consistently provides human rights for its citizens.

    d. Repressive = A government who consistently encourages it citizens to exercise their human rights.

    e. I do not know which of the above is best.

Appendix C - Participation consent forms from parent/guardian

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: _Tamika Williams_   Date: _2-8-18_

Signature: _Tamika BWilliams_

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: _Lalinda Jayamanne_   Date: _02/07/18_

Signature: _Jayamanne_

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: _Marcela Lora_   Date: _2/7/18_

Signature: _Meeorl_

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

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Parent Name: _Heydy Contreras_   Date: _2-8-18_

Signature: _Heydy Contreras_

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: Michael Daoheuang   Date: 2/8/18

Signature:

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: Absal Jimenes Gvl   Date: 2-8-18

Signature:

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: Molly Stevens   Date: 2.8.18

Signature: MStevens

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: Patricia G. M   Date: 2-6-18

Signature: Patricia Garcia M.

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: _CRISTOBAL DELGADO CHAVEZ_   Date: _2-7-18_

Signature: _Cristobal Delgado_

Informed Consent Signature Sheet – **Researcher copy** (return to Jon Avery)

I have received and read a letter of informed consent about the research in which my child has been asked to participate in. I understand the study is a part of the reading curriculum and may benefit the reading skills of my child. I understand that my child's participation will involve a three week unit teaching her or him to use word parts to comprehend new academic vocabulary. I understand that my child's identity will remain anonymous throughout the study. I understand that my child's participation in this study is voluntary and that I may withdraw her or him at any point in time.

Parent Name: _ASMO Ahmed_   Date: _2/9/18_

Signature: _Aml_

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Appendix D - Pre-test results

Student	Total Score	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
A	5	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0
B	8	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
C	6	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
D	7	1	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
E	14	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1
F	9	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	1	0	1
G	14	1	1	1	1	1	0	1	1	1	0	0	1	0	0	0	0	1	1	0	0	1	0	1	1
H	12	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	1	1	0	1	0
I	9	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	0
J	8	1	0	1	1	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0
	Test Question	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
	% Correct	100	60	80	90	50	20	40	40	40	10	10	60	20	0	10	40	30	40	10	20	50	30	40	30

Appendix E - Post-test results

Student	Total Score	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
A	16	1	0	1	1	1	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0	0
B	18	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0
C	14	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	1	0	0	0
D	22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1
E	14	0	1	1	1	0	0	1	1	1	1	0	0	1	1	0	1	1	0	1	0	1	0	0	1
F	11	1	0	1	0	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1
G	19	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1
H	16	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	1	0	1	0	1	1	0	1	0
I	11	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	1	0
J	16	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	1	0	1	1	1	1	0	1	0
	Test Question	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
	% Correct	90	70	100	90	80	40	70	80	90	80	40	70	60	50	30	70	60	80	50	60	90	40	40	40

Appendix F: Survey of student experience of teacher and intervention period

My Teacher was...
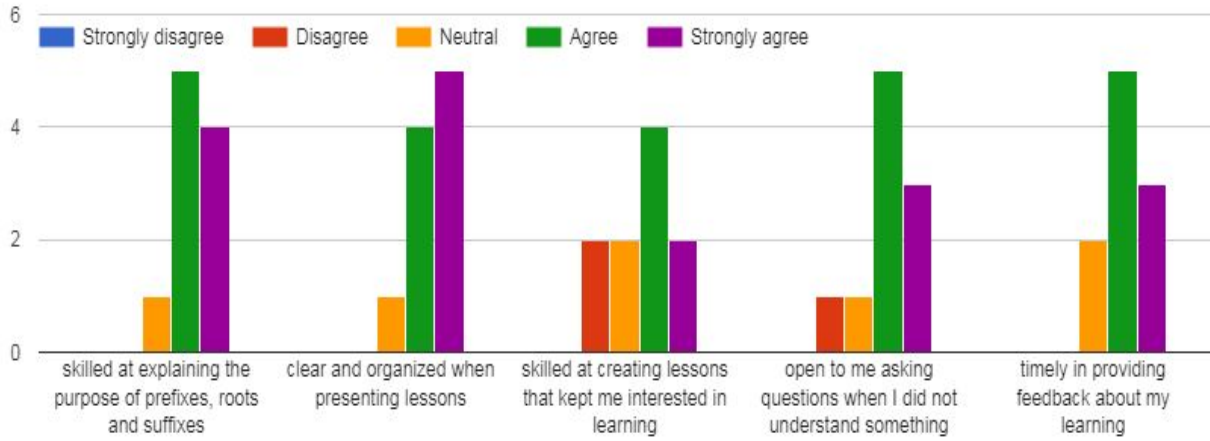
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