

## Using the Concept Mapping: A Strategy to Assist Students in Vocabulary Acquisition

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### Abstract

This experiment was created to examine whether direct vocabulary instruction through the use of concept mapping would help students acquire social studies vocabulary. The authors of social studies textbooks assume more often than not that all students hail from similar reading levels and knowledge. The Nation's Report Card showed that 31% of students were below the basic levels in social studies achievement. There are several reasons, one being that textbooks are designed for students who are on basic reading levels. When students are not, this may lead to a lack of understanding of basic vocabulary. Social studies is a technical subject with many concepts that are interrelated. There has been research that demonstrated concept mapping as a successful strategy to help students with reading comprehension. A concept mapping tool was used to instruct students on social studies vocabulary to see if they acquired the vocabulary.

The social studies department at this site borrowed a vocabulary list from a major textbook company. The list was used to test students to determine their social studies vocabulary. In an effort to improve social studies test scores, student interest, and academic grades, students used concept maps to improve their achievement and understanding. The objective was to raise awareness for direct instruction of social studies vocabulary and improve social studies achievement. Students were administered a vocabulary pretest at the beginning of their 3rd marking period. Then students were administered the treatment. At the end of the 3rd marking period, the posttest was administered.

The results showed that students benefited from the treatment. Students' overall scores did increase from pre- to posttest. The meaning of some words proved to be difficult to acquire. The social studies teacher who was interviewed indicated that he may or may not use concept mapping in the future. He did believe that there was value for the use of the strategy. Limitations included small student sample size and teacher response to the strategy. The strategy should be used in other technical subjects to see if students may find the strategy helpful. This study raised awareness for direct vocabulary instruction.

ERIC Descriptors: Concept Mapping, Vocabulary Development, Social Studies, Middle School, Textbook Bias

## Introduction

The performance of students, according to the National Assessment for Educational Statistics (2012), revealed that the overall outcomes in the social studies content area showed no significant differences in performance. Specifically, 31% of students are scoring at the basic level. At the fundamental level, vocabulary is a necessity for a student to be successful (i.e., to pass) in any subject, especially the technical subject of social studies. Novak and Canas (2008) studied success in vocabulary acquisition in other technical subjects like science, and concluded that, in general, vocabulary acquisition is helpful in understanding difficult content. For the purpose of this applied dissertation study, students were administered both a pretest and posttest on a social studies vocabulary test with the intervention of concept mapping to see if this strategy produced desirable results in vocabulary acquisition.

Social studies department members at this particular study site took the initiative to meet the standards for the New York State Education Department (2010) and Common Core Learning Standards (CCLS, New York State Education Department, 2013). The concern for educators was to increase student vocabulary, reading comprehension, and achievement. The New York State Education Department provided the CCLS that outlined the need for vocabulary acquisition. With the implementation of CCLS, social studies teachers were forced to focus and provide urgent attention to solicit students' vocabulary acquisition through the use of best practices.

**The topic.** Concept mapping has been widely used in the field of education and has been found to be successful in helping students learn technical knowledge in various subjects. The focus of this applied dissertation was to assess the vocabulary acquisition of seventh-grade students using concept mapping for direct vocabulary instruction, particularly in social studies. Specifically, this study examined whether the utilization of concept maps with seventh-grade students increased their social studies vocabulary acquisition as measured through pre- and posttests.

**The research problem.** There are many middle school students who are underachieving in social studies, according to Nation's Report Card (National Assessment for Educational Statistics, 2012). There has been a tremendous focus on the CCLS to the point that a concentrated effort was brought forth on behalf of social studies teachers to implement the call for rigorous vocabulary acquisition. On the 1st-year implementation of CCLS in the state of New York, there was no research that examined direct vocabulary instruction in the acquisition of social studies vocabulary under this new mandate.

**Background and justification of the problem.** There are several aspects of social studies achievement that cause problems for educators. One of these was vocabulary acquisition, which was the main focus of this study. When teachers become certified, they are usually certified in their discipline alone. For instance, a teacher who passes the certification for social studies does not automatically have his or her certification in reading and language arts as well. Various disciplines in the field of education require different certification; however, it is a known fact that most of these disciplines are interconnected. Technical subjects, such as social studies and science, can be best taught and understood if an educator has at the very least a good literacy background. As such, there is a need to explore augmentation in other fields for teachers who possess the required literacy certification in technical subjects, such as social studies or science. Moreover, because vocabulary and reading skills are related to students' academic performance, for students who strongly lack reading skills and social studies vocabulary, it means that they do not have the necessary background on basic levels needed for processing the words and information in their textbook.

In line with this, Snow (2009) purported that many adolescents in the United States struggle with reading and comprehension. According to the National Center for Educational Statistics (2009), "at grade eight, the average Reading score in 2009 was one point higher than in 2007, and four points higher than in 1992, but was not

consistently higher than in all the assessment years in between” (p. 3). Brown (2007) and Snow suggested that authors of textbooks, during the creation of their respective books, mistakenly assume that all students possess the same levels of reading skills, vocabulary base, and prior historical knowledge. Moreover, about 25% of eighth-grade students showed low basic levels of proficiency. This value could approach 40% in large urban districts. Such assumptions that all students have the same reading skills would ultimately lead to some students having difficulty in understanding the concepts being taught in the classroom; hence, they could not cope with the pace of the other students who possess higher reading skills.

Further, Brown (2007) purported that “understanding social studies textbooks does not receive sufficient attention” (p. 185). Nevertheless, comprehending social studies concepts is undeniably important because it is necessary for future discussions on the subject. However, there are no formal tests to evaluate properly and accurately a student’s understanding of these technical concepts. When students are hindered by the insufficient understanding of textbooks, it can limit their achievement as reflected on report cards, class discussions, and state test scores. Furthermore, textbooks offer constructive activities and homework questions, such as defining the terms, by using the glossary from the back of the book; however, these activities are meant for students who grasp concepts spatially or at a specific reading skill or knowledge level.

There is no established standardized set of social studies concepts that students are expected to know, and this absence is considered a problem. Students who do not know integral concepts that belong to a particular subject will have difficulty in the future as the subject becomes more complex. This applied dissertation study aimed to influence and contribute to current research by highlighting what level of vocabulary is necessary for seventh-grade students to help them better understand social studies material.

The objective of the applied dissertation study was to examine the effectiveness of a reading technique, known as concept mapping, on social studies vocabulary acquisition. For a subject like social studies that utilizes abstract reasoning and a multitude of concepts concept mapping was deemed useful for categorizing the concepts. Daley et al. (2010) listed multiple areas where concept mapping can be most useful, which included the acquisition of concepts, teaching and learning, assessment and scoring, knowledge development, software development, professional development, and research methods. This research study examined whether the application of concept mapping could successfully assist seventh-grade students in assigning meaning to key concepts and better understand the relationships of these social studies concepts.

The study site’s district was located 25 miles north of New York City with an area of 8 square miles and a population of approximately 20,000 residents. According to the school district records in 2010, 58% of the student population were African American, 27% were Hispanic, and 9% were Caucasian. In 2008, the racial breaking in the city where the study site was located included 74.3% Caucasian, 15.1% Hispanic, and 12.3% African American. The middle school was close-knit where many people from the community worked (New York State Education Department, 2010). The Hispanic population was increasing along with non-English-speaking students from multiple backgrounds. A mismatch between the language of textbooks and first language of students may be a determining factor that causes poor vocabulary acquisition and reading comprehension. Thus, the study focused on determining demographic factors inherent in students that may have had an effect on students’ reading and vocabulary skills.

**Deficiencies in the evidence.** Hairrell et al. (2010) and Willits (2002) conducted studies regarding the usefulness of concept mapping in relation to social studies and other subjects that have only focused on reading comprehension. This applied dissertation study aimed for relevance by reinforcing that direct vocabulary instruction being taught with concept mapping had an effect on vocabulary acquisition in social studies. The intervention used in this study was through Inspiration Software (2010), which assisted students who may have encountered difficulty in social studies. Also, it must be noted that there was limited research about the use of Inspiration Software and concept mapping in social studies.

**Audience.** The audience who may find this helpful is educators teaching under the new mandate of the CCLS. The CCLS directed teachers to take a new look at how students acquire social studies vocabulary. Researchers, concept mapping software designers, and state education officials may also be interested in the outcomes of this study especially in what social studies vocabulary was difficult or not. Nevertheless, seventh-grade male and female students who were struggling in social studies may be the ultimate beneficiaries of this study. Social studies students and teachers may possibly benefit from the use of concept mapping as a strategy in increasing vocabulary acquisition and reading comprehension.

### **Purpose of the Study**

The purpose of the study was to determine if there were significant differences between outcomes of the pretest and posttest vocabulary assessments that used concept mapping strategies in a social studies classroom that was composed of seventh-grade male and female students. The extent to which concept mapping was useful in a social studies classroom was the focus of this study. In the advent of the implementation of the CCLS, this study served as an effort in addressing the need to augment the acquisition of vocabulary for students in social studies. The CCLS is an accountability movement to ensure teachers use best practices. Typically, textbook presentation of vocabulary offers one approach of learning the vocabulary, which, more often than not, does not suit all students' reading abilities. Students come from varying backgrounds that have differing perceptions and past knowledge. These various perceptions and knowledge then affect the way they interpret history. In addition, they often have different reading-skill levels. If a student does not learn how to read, he or she will not read to learn; this includes vocabulary. If students do not assign meaning to the technical words of vocabulary, they will not be able to understand social studies text, which limits reading-skill development. Given this situation where students carry different reading ability, it is the responsibility of the teachers to strive to put extra effort to extract information from the textbook in an objective fashion so that students comprehend the significant relationships and concepts and help connect these ideas to come up with a meaningful interpretation of a concept.

### **Conceptual Framework**

Humans tend to relate concepts to other concepts when they are thinking. For this study, the instructor asked students what they thought of when certain words were mentioned. If one would say *sports car*, the students said “fast,” “powerful,” “expensive,” and “cool.” They associated concepts to each one naturally. This strategy of concept mapping used a physical map to show connections. This was helpful for students in social studies to see those connections through the use of concept mapping. Concept mapping can help students acquire vocabulary.

**Concept mapping.** Ausubel (2000) provided the notion that students can learn using concept maps, specifically by using a representation diagram. A user represents his or her thoughts or patterns of thought through the use of a diagram that they can change and revise as the problem becomes more defined. Canas (2003b) and Novak and Canas (2008) provided a fresh look at what concept maps are. Their studies also included the literature behind concept maps and technologies that are available to help facilitate and create concept maps. Novak and Canas created a software program concept mapping tool. Novak and Canas from the Florida Institute for Human and Machine Cognition conducted research based on how humans and machines think. Concept mapping is an integral framework that allows students to understand and easily analyze each detail needed in order to make progress in their research. Furthermore, Novak and Gowin (1984) and Canas (2003a) believed that Ausubel's (2000) cognitive psychology theory was the basis for what concept maps attempt to achieve. Students use concept maps to learn a concept's meaning and how it relates to another concept, which is the primary idea of cognitive psychology theory. The relationship of the concept to another concept is where the development of understanding progressed. Novak (2002) wrote extensively about the construction of meaning for concepts and how concept mapping leads to a learner's command of social studies concepts and their meanings.

Novak (2010) suggested the use of concept mapping as a facilitative tool in schools and corporations and showed how a school in Costa Rica demonstrated improved test scores because of the use of concept maps. Novak (2002) also showed that the “process of meaningful learning builds an integrated framework of concepts” (p. 22).

The reasons why students are successful with concept maps are because they allow students to understand social studies concepts thoroughly and thus make the extensive technical vocabulary easier to understand. O'Donnell et al. indicated that students with vocabulary and reading deficits recall information better through the use of maps versus reading text for tests. As for Leake et al. (2004), they demonstrated the importance of concept maps and how they have permeated the study of knowledge and concept acquisition. They designed a tool for concept mapping that is done electronically. As mentioned earlier, Canas (2003a) was heavily involved in concept software development. One can download the concept software and use it. According to Leake et al., this also allows the user to use a “suite of tools to support and generate concept map tools in electronic form, interconnecting those maps, and annotating them with additional materials such as images, diagrams, and video clips to develop rich browsable knowledge models” (p. 1).

Canas et al. (2004) furthered the study of concept mapping and aimed to have a web of concept maps that helped not-for-profit organizations develop concept maps and concept map servers so people could access and build other maps. The long-term goal is to have a map where people may weave their maps together, creating a collective map. An easier way to create a collective map is through the use of cloud technology, which is an electronic database of information. This may contain songs, photos, and documents, but in this case, it would be a collective of concept maps that is ever evolving and growing. The maps would align with each other using each concept as the link to the next map or maps.

In the future, the goal for the cloud technology would be to have a holographic projector that is interactive. Ghuloum (2010) wrote about learning in this type of environment. The user would stand in the middle of the controlled space room where one would be able to manipulate a list or host of holographic images. The user would be able to manipulate and change the location of the images using sensors, such as an Ipad. Each hologram would represent a concept that the designer arranged or moved in the air to link up with another concept. The controlled space room would be like the current concept mapping done in a two-dimensional way on a Smartboard or an Ipad. The mapping would be done in real time and operate in a three-dimensional environment with a person standing in the middle of a holograph projector and by voice command could bring up the list of concepts and be able to manipulate them. If a human could interact with the text or concepts in a new manner other than the traditional pen and pencil and reading information from the book, it could revolutionize the way humans learn and interact with technology. The futuristic process of manipulating the concepts in the air would lend itself to the user truly experiencing the learning in a physical kinesthetic manner. Social studies teachers around the world would finally be able to bring the text alive and shatter the old paradigm of being bound to the classroom and two-dimensional technologies. From the perspective of the social studies teacher, the need has always been to get away from the textbook and be able to take all the students to some place to teach them in a real-world and real-time atmosphere.

Prior research by Novak and Gowin (1984) and other authorities on the subject (Brown, 2007; Frye, Trathen, & Wilson 2009; Robinson et al., 2006) established the use of concept maps as beneficial in reading comprehension and vocabulary acquisition in several subjects and an aid in solving problems. As of now, the further exploration of vocabulary acquisition and acquisition of a technical set of vocabulary in social studies needs to be done. In addition, the notion that there may be a standard set of social studies concepts across grade levels throughout the curriculum should be established. Concept mapping has been the established tool to help vocabulary acquisition (Porter & Herczog, 2009). Software programs are also available to aid in the creation of concept mapping. In this applied dissertation, Inspiration Software (2010) was used.

**Textbook designs.** Textbook companies face the difficulty of designing their product in such a way so it is usable for most readers. The high costs that are involved make this essential. There may be students who are not interested in social studies, and indifference does not foster comprehension. Students may also lack motivation because of their reading competencies or lack of interest. A teacher can acquire students who may come from different teaching styles and schools or may enter schools at different skill levels. Students may not have a sufficient understanding of concepts because they have not been previously exposed to technical writing at the middle-school level. Social studies can become more difficult as the school year progress as more and more information is introduced. In textbooks, as chapters progress, the concepts can increase in number. A chapter may have only four to five important concepts and then when students progress they may find that the next chapter has 10 to 15 concepts. Some concepts can be introduced in a beginning chapter, used in the remaining chapters of the textbook, or in some cases never be used again.

Porter and Herczog (2009) wrote, “With each grade level, subjects become more complex, text becomes more difficult, school becomes more demanding, and students fall further and further behind” (p. 53). Porter and Herczog highlighted symptoms of the problem that are integral to what the problem is: Reading levels and textbook design cannot always be controlled. Students experience difficulty as they move up to a new grade or new book in each subsequent year. When students have difficulty with the previous year’s information, it may be difficult for them to build on the understanding or have limited understanding they obtained from the previous year. Students who have not been exposed to technical social studies vocabulary as they progressed might have a problem in the end. It is imperative that they have a firm grasp of what they are reading at each level.

There has not been an expectation of students learning a set of social studies vocabulary concepts (Hedrick et al., 2004). Captains know parts of a boat when they communicate the names of these parts to their crew the crew understand what the captain means. When the teacher uses the technical words in social studies, it is imperative that

students know what the important words mean because they should have been taught beforehand. This is the entry level into any further exploration of a subject. Therefore, a set of vocabulary words should be established as a set of accepted information before one can graduate to another level of understanding of the subject.

**Student vocabulary comprehension.** The transition from elementary to middle school can be a time of adjustment, and new schools mean new textbooks that are more advanced. Reading skills and a sufficient vocabulary are very important when it comes to learning social studies. Joftus (2002) also reported, “less than 75 % of all eighth-graders graduate from high-school in five years, and in urban schools these rates dip below 50%” (p. 1). Students have difficulties because they may not fully comprehend important vocabulary. That is why teachers are there to explain. If students had a better vocabulary, they would most likely have more success in understanding sentences, comprehending paragraphs, and eventually writing essays and answering exam questions. Students who lack social studies vocabulary experience obstacles to their achievement and growth in the subject. Chant (2009) provided insight on teaching reading as a social studies teacher. A 1st-year social studies teacher is not prepared to teach if not also trained as a reading teacher. This is in response not only to the difficulties of the social studies text but also to the reading deficiencies reported by the National Center for Educational Statistics (2009) and echoed by teachers around the country. Joftus said that there is nothing new about using different reading-comprehension strategies. Joftus highlighted how there are problems through reading comprehension, which is the case of social studies because of the technical vocabulary.

Biancarosa and Snow (2006) performed a study that included several reading comprehension interventions with fifth-grade students. The No Child Left Behind Act of 2001 (2002) was a motivator for all teachers to close the achievement gap. Biancarosa and Snow indicated that there is a reading-comprehension problem, and it is rooted in the lack of vocabulary. Vocabulary needs to be built within a subject, and this can be done using writing and reading strategies in any academic subject. Now that there is a core standards initiative, this notion has changed. Reading and writing activities are being stressed in and across all subjects.

Williams, Hall, and Lauer (2004) reconfirmed what other researchers have concluded: There is a wide range of reasons why students do not grasp technical texts. They found that students are sensitive to text structure. Proficient readers can grasp text when concepts are organized. There needs to be a focus on text structure, but again students must understand the concepts to have them make sense in varied text structures. Williams et al. (2004) also reported that three variables--text structure, content familiarity, and reading comprehension--affect performance.

Ogle, Klemp, and McBride (2007) wrote that students may be disengaged and have different interest levels in social studies, particularly when students' cultures are addressed. This may explain why student interest and motivation are hindered. Some students are disenfranchised because American history textbooks often neglect to mention other cultures (other than the majority) and their contributions. There may be a geocentric viewpoint conveyed by textbooks, and cultural history may be portrayed in an unappealing manner. At times, textbooks can cast cultures in a light that may be hurtful to a student of that culture. For example, African American students may be disenfranchised because American history textbooks often neglect African American leaders and the culture tends to be portrayed as low-class citizens, which may hinder a student's interest. Conversely, Caucasian students may become sensitive when textbooks refer to slave holders as all being Caucasian and that these individuals pushed Native Americans from their land. Any student is subject to these sensitivities resulting from how students' backgrounds are portrayed in a textbook, which could possibly hinder his or her motivation in social studies.

McCabe (2003) indicated the connection between student performance and the textbook's appearance. Students can become unmotivated if the textbook is kept in bad appearance with regard to conveying information. Missing pages, bent book corners, and broken book spines are among the culprits that show students that the information is not held in high regard. Brown (2007) stated that it is impossible to construct a book that caters to all reading levels primarily because concepts are different. Students can miss context, and social studies can seem abstract to them, especially concepts or relationships that words may have with one another. When these concepts occur in different time periods, the time difference also hinders their learning because students can believe the history is not relevant to them and immediately want to question why they are learning such material. Hedrick et al. (2004) wrote that passages of social studies textbooks can be difficult to understand when students lack basic background knowledge.

Students who are having difficulty in understanding social studies will struggle with the wealth of information that present textbooks give. As noted earlier, Brown (2007) wrote that “understanding social studies textbooks does not receive sufficient attention” (p. 185). The research on the use of mapping has been favorable on

concept mapping, and people in many fields support the use of concept maps. There are several reasons why concept maps are utilized, including deficiencies of textbooks, lack of reading in the home, student interest, and so forth. In the academic community, there is a host of concerns in social studies learning in regard to common everyday civics knowledge, and these are basic concepts. Robelen (2011) believed that middle school students lack civics proficiency on the National Assessment of Educational Progress. The conclusion was that there was no significant change when it came to eighth graders in the subject of civics from 1998 to 2006; social studies and civics are similar. News channels from time to time poll the public to see what their knowledge is of current events, and the general public does not seem to have basic civics knowledge. In order to be good democratic citizens, students must have social studies knowledge.

Kim, Vaughn, Wanzek, and Wei (2004) produced a study on how graphic organizers or concept maps as visual displays help students with learning disabilities by organizing their verbal information and thus improve their recall. Social studies vocabulary acquisition research is important because of lack of motivation, learning disabilities, and textbook design. Seemingly, the use of concept maps may help alleviate a wide variety of problems.

Biancarosa and Snow's (2006) report summed up all of the issues with reading and vocabulary achievement. The lack of incentive and engagement also explains why skilled readers and writers often do not progress in reading and academic achievement in middle and high schools. Another cause may have been that reading is not taught by itself and is entwined with language arts. Perhaps reading itself could be maintained as a separate discipline. The fact that subjects are infused simply highlights the fact that there are all types of problems when extracting meaning from textbooks. Incentives are weak for students to learn anything aside from gaining a basic public education. Teachers' usual complaint of apathy for school is important but simply an example of one more problem that hinders growth.

Gallavan and Kottler (2007) wrote of using concept maps when reinforcing spatial intelligence, a concept from Gardner's multiple intelligences, to help augment reading comprehension. The use of a spatial tool such as concept maps can be helpful and alleviate the boredom or lack of interest of students. The use of multiple intelligences would be a suitable way to increase student achievement and interest in social studies. With the use of concept maps, students who are better at using spatial stimuli particularly excel. To overcome the problem of poor social studies concept knowledge, social studies teachers need to use a variety of strategies. One viable tool Gallavan and Kottler suggested was the use of graphic organizers. They said, "They are useful for reading difficult material, highlighting information, valuing cultural diversity, meeting needs of special populations, and supporting language learning" (p. 117). There are various types of concept maps that may be used for different exercise situations.

### **Need for Further Research**

Derbentseva, Safayeni, and Canas (2006) wrote that focus questions are important to guide the instruction and use of concept maps. Focus questions are an integral piece that people overlook when using concept mapping. Focus questions help to guide the information students and teachers are attempting to glean. The questions set a structure instead of arbitrarily setting out and making meaning from nothing. These questions are important to drive the learning and extract the meaning out of concepts especially when using social studies concepts.

Harmon and Wood (2008) said that "middle level students need to engage in metacognitive thinking about what they do and do not understand as they encounter unfamiliar vocabulary" (Metacognition Is an Important Aspect of Vocabulary Learning section, para. 1). These researchers called for an expanded awareness of vocabulary. Similar to Fisher and Blachowicz (2007), thinking about what to do and how to think about vocabulary is important for the acquisition of vocabulary. When students are simply answering questions or defining vocabulary from the textbook glossary, they are not learning the word. Instead, they are just memorizing it. The undesirable fact is that it is the standard practice in a social studies classroom. Clearly, the implementation of vocabulary lists, incorporation of concept maps, and assessment of social studies technical vocabulary is important and leads to further understanding of subject comprehension, which means concept mapping is an acceptable way for students to perform and learn vocabulary thus building their comprehension. Vocabulary lists and identifying terms that students do or do not know are the backbone of teaching and learning social studies concepts. These metacognitive skills help. The research is lacking in terms of vocabulary acquisition and understanding that are imperative to understanding the subject.

When students are hindered by the anonymity of textbooks, it can limit their achievement in state testing and class assessment and lead to a poorly educated social studies student. Textbooks can offer activities and

homework questions; however, the book can only offer material at an average reading level. The book is simply a tool that has no bearing on feeling or knowing the student personally; therefore, the book cannot predict what vocabulary deficiencies or readings difficulties a student may have possessed. Consequently, the instructor is left to fill in the gap. In this case, concept mapping fills those deficits of low understanding and reading difficulties (Hedrick et al., 2004).

Hairrell et al.'s (2010) study addressed fourth graders' understanding of vocabulary in social studies. In this study, Hairrell et al. presented a framework of teaching and learning strategies that were introduced before and after social studies text reading. This applied dissertation was an effort to develop and relate vocabulary knowledge to social studies concepts. The strengths of the study done by Hairrell et al. were the methods introduced before, during, and after. Their study utilized four different strategies before reading. The first was to identify critical vocabulary. This applied dissertation study did that by way of vocabulary lists. The second was the use of anticipation guides. Anticipation guides were a way to activate prior knowledge and provide background knowledge. The third was using chapter overviews. That strength was repeated by providing a summary of concepts for a certain chapter with a list of vocabulary used. The fourth was the use of vocabulary maps. In this applied dissertation study, concept maps were used, which are similar to the vocabulary maps Hairrell et al. used.

During reading, Hairrell et al. (2010) employed the use of chapter overviews by revisiting them. McCoy and Ketterlin-Geller (2004) reiterated that middle-school students enter secondary-content classes with reading difficulties or reading below grade level. In their study, McCoy and Ketterlin-Geller believed there was a diverse population that entered middle school. Diverse referred to the variety of problems that students may arrive with in addition to poverty and poor instruction. McCoy and Ketterlin-Geller also called for text demands to be reduced. In their study, students should have to read more and have a variety of texts to use for practice. McCoy and Ketterlin-Geller had a different approach to the problem, which was one that was not suggested by this applied dissertation study. The goal was to learn as much vocabulary as possible and then augment it by using and implementing a variety of social studies texts. However, McCoy and Ketterlin-Geller called for a concept-based model that did have some relevance. The teacher determined what the important concepts were and worked to that end. This applied dissertation study attended to the urgency to practice social studies vocabulary with concept mapping, developed a vocabulary test that assessed a student's knowledge of this technical vocabulary, and worked with a master list that students were familiar with as they moved through social studies classes through their academic career.

### **Synthesis of the Findings**

Students in the same classes are expected to be on par with each other in terms of their reading comprehension and vocabulary skills, both of which are essential to any subject matter at this study site. This is the same assumption that textbook authors had. However, this was not true in the actual case of students enrolled in school. There were several students who did meet the expectations that textbook authors had in writing their books, and others fell short in performance especially in vocabulary and comprehension. These varying performance levels of students were brought about by their differences in racial mix, family background, and community perceptions and beliefs. Because this was not being addressed in textbooks, the possibility of having difficulty in understanding the concepts being taught through their textbooks was real. Students tended to underperform as they progressed through their schooling years, especially because topics and concepts tended to be more complex as students progressed through their subjects. For the case of social studies, understanding the concepts becomes difficult if students underperform in reading comprehension and vocabulary.

In line with this, concept mapping as a tool to present concepts graphically had been proven to aid students successfully who experience such difficulty in vocabulary acquisition and reading comprehension of the different concepts in their different subjects. Such being the case, the effectiveness of concept mapping in social studies, which had not yet been explored, was suggested to be investigated in this study.

In conclusion, based on the literature review performed, there was a need to determine if concept mapping was indeed a significant tool in improving vocabulary acquisition of students in their social studies classes. This was performed through the execution of the treatment (concept mapping activities) to students while taking note of their before and after performance through a pretest and posttest.

### **Research Questions**

The following research questions guided this study:

1. What were the statistically significant differences in the vocabulary scores of seventh-grade students between the pretest and posttest vocabulary test after introducing concept mapping?

2. From the outcomes of the pre- and posttest, was there a pattern of word acquisition in terms of difficulty? What words were they?
3. What were the teacher's perceptions about the use of concept maps as a tool for teaching vocabulary in a social studies class?

### Methods

The purpose of this study was to determine if there were significant differences between outcomes of pre- and posttest assessments of vocabulary after using concept-mapping strategies in a social studies classroom composed of seventh-grade male and female students. Specifically, this study aimed to help increase struggling students' daily performance on quizzes, homework, projects, and tests on social studies. The social studies department members had concluded that it was necessary to increase student vocabulary in the area of social studies through the use of concept mapping. The students were measured by the analysis of their pretest and posttest in vocabulary as designed by the department members.

Students were expected to master words as an indicator of their understanding of key social studies concepts. Using vocabulary master lists and the concept mapping Inspiration Software (2010), students were able to achieve better grades and understanding in social studies. Inspiration was an interactive computer program that functioned as an interactive blackboard, using a mouse instead of chalk. This software was provided by the district. This software program allowed the user to choose shapes in various colors, insert text and pictures, and manipulate these shapes to express definition and relationships among social studies concepts. Moreover, the program allowed the users to express themselves visually in many ways with just the use of the mouse. Spatial learners and students who were more active benefited from this because they were interacting with the text instead of copying or writing.

### Study Area

The district chosen for this study was located 25 miles north of New York City with a total area of 8 square miles and a population of approximately 20,000 residents. According to the 2006 district records report, there were 58% African American students, 27% Hispanic, and 9% Caucasian enrolled in the school district. The researcher's district was located within New York, and according to the 2005 U.S. Census Bureau, the population of New York was 73.8% Caucasian, 17.4% African American, and 16.1% Hispanic. The middle-school in this district was a close-knit school where many people from the community worked. The Hispanic population was increasing and so were non-English-speaking students from multiple backgrounds.

The school was composed of the middle school and high school. The middle school was on the third floor and consisted of the seventh and eighth grades, and the lower floors composed the high school. The student population did not exceed 500 for the entire school, and the middle school population did not exceed 240. Students had daily access to the computer and Internet. Also, students had a nine-period day with each period lasting for 40 minutes. There were also afterschool programs, and teachers stayed until afterschool hours every day to assist students in their learning. The middle school was an international baccalaureate school.

### Instruments

The social studies department instructors designed the vocabulary tests using vocabulary from McGraw-Hill (n.d.) and the Test Designer (Tribrio, 2011) Web site for the use of the seventh and eighth grades. For each concept choice on the test, there were four choices offered similar to that of a typical multiple-choice test. The definition choices were other definitions of the vocabulary. These test choices were pulled from other definitions of the concepts provided by McGraw Hill. The definitions were defined by the *Oxford Online Dictionaries* (Simpson, 2013) or *Creating America: A History of the United States* (Holt McDougal, 2001) if concepts originated from the text.

The test contained different concepts, and students attempted to match the concept with the definition just as they would do in a typical multiple-choice format. The English language art department teachers also reviewed the vocabulary test and used these words in their spelling lists because these subjects were interrelated in terms of aiming to improve the vocabulary of students. The social studies department teachers also had significant experience in creating and using chapter tests aided by the Holt McDougal (2001) software.

The qualitative instrument consisted of an interview with the social studies department chair who taught 1 seventh-grade class. This interviewee gave relevant input to this study because of the significant experience he had in the field. The questions that were asked of the social studies department chair were as follows:

1. "How do you like concept mapping as a teaching strategy?"

2. “Do you think you will use this strategy again?”
3. “What did you like or not like about the strategy?”

### Procedures

In general, the procedures entailed collecting data from student interaction with concept mapping, Inspiration Software (2010), and social studies vocabulary. Before the treatment, students were given a social studies vocabulary test in order to assess their technical knowledge of social studies prior to the implementation of the intervention. This was the pretest. The vocabulary test consisted of 35 multiple-choice-type questions with four different choices per question. Each question represented one concept in social studies. In the test, students attempted to match the definition with the concept (see Appendix A). This same test was used as a posttest after the intervention. The intervention was introduced during the third marking period equivalent to 10 weeks.

Social studies classes met five times per week. Students were exposed to concept mapping during class time and made at least one map for each class period. The class spent 15 minutes on the map of the most notable concept of the day for each class period.

The concept-mapping strategy was also employed in class with all the concepts of the current chapter in addition to relevant technical words from the master list (see Appendix B). A student’s grade was based on the results of the chapter tests, homework, and a project. This concept-mapping strategy was employed for any new concept introduced from the textbook chapter vocabulary or master list. Students had access to the treatment materials whenever they were at school. These students were exposed extensively to direct vocabulary instruction via concept mapping and Inspiration Software (2010) whenever available.

The concept maps were created by the students and instructor for the concept-map group as they learned a new concept. Students were exposed to the tools that aided them in the comprehension of social studies concepts, vocabulary from the master list that consisted of the McGraw Hill (n.d.) vocabulary list, concept maps, and the Inspiration Software (2010). Through the use of these tools, students were able to manipulate concepts and assign meaning to difficult and confusing social studies vocabulary terms, which aided them in understanding these terms more easily.

Adequate time was allotted to explain how to create concept maps to students. The instructor explained the process and modeled the activity on the board for the class when reviewing the vocabulary list and chapter vocabulary in order to encourage these students to replicate the practice in their homework and even other subjects. This process was explained as another form of note taking. The long-term objective was that concept-map making may be applied to other classes as well, especially when students encountered new concepts germane to that subject matter.

Each vocabulary word was chosen as one that would be an average word or most relevant word to what was studied in the third marking period. For each textbook chapter, concept mapping group students received a concept list germane to their chapter, but the list also contained words from the McGraw-Hill (n. d.) master list whenever applicable.

The third marking period, which was equivalent to 10 weeks, covered three textbook chapters. Students were taught how to use concept maps and were required to finish their homework vocabulary by creating the maps at the beginning of the chapter. Students were also required to practice for their chapter test essays using key words that they outlined and map their practice essays. At the end of each section, homework questions from the textbook were answered by the students using the concept mapping method for each section. Students were then given their chapter tests at the conclusion of each chapter.

The instructors for the classes were traditional lecturers who maintained a structured class. Reading together with note taking was the important aspect of the daily activity. There were group activities where students were dispatched using the jigsaw method, rubrics for different projects and essay writing, and various methods that were being utilized in addition to using the traditional methods as a guide. Test design was a standard form from the McDougal Littell (2004) test generator. The design consisted of 20 multiple-choice questions and an essay that counted for 5 points. Every other chapter test design was (a) a 10-word bank, (b) 10 multiple-choice or true and false questions, and (c) an essay, respectively. The pre- and posttest had 35 multiple-choice questions.

The textbook used for this study was *Creating America: A History of the United States*(Holt McDougal, 2001). Each chapter had an average of three sections. There were various pictures and reading selections in each section, and there were usually side questions that were meant to enrich the reading experience of the students. This book was written for seventh and eighth graders in middle school. Usually, a chapter contained three or four sections

at the maximum with each section having three to five pages. After each section, there were four homework tasks or questions meant for the students to answer. The first of the four was a set of vocabulary words, names, or terms to define. The second and third questions were critical-thinking questions containing three subset questions each. For example, they were listed as 3, 3a, 3b, and 3c, respectively. The fourth question asked for the opinion of the students. This demonstrated how textbook questions were provided to allow students to give their own input in order to encourage them to assign their own meaning to the concepts. This was important because it showed how a student answered questions from the textbook using the concept maps instead of arbitrarily using the glossary in the back of the book.

The chapters from the book that were used in this study are presented in chronological order: Chapter 7, The American Revolution; Chapter 8, Confederation to Constitution, Constitution Handbook; Chapter 9, Launching a New Republic. In Chapter 7, The American Revolution, students became familiar with the concepts of amendment, guerilla, and primary source. Chapter 8 had the words *amnesty*, *media*, *genocide*, *delegate*, *classical*, *ratify*, and *petition*. Chapter 9 covered the words *republic*, *quartered*, *domestic*, *imperialism*, *emigration*, *suffrage*, *capital*, *revenue*, *native*, *sovereignty*, and *alliance and unalienable*. The Constitution Handbook chapter covered the words *constituent*, *demographic*, *federal*, *nullify*, *jurisdiction*, *alien*, *bias*, *amendment*, *subsistence*, *topographic*, *bureaucracy*, *urbanization*, *coalition*, and *institution*. All words were used in any part of the chapter as necessary. This did not limit these words to the concept mapping; there were a total of 93 words that were on the list from McGraw-Hill (n.d.). These words were taught because they were on the test. These were the words that were integral to understanding social studies, which was the basis of American history for seventh graders.

As the instructor moved through the chapters and sections, the words were mapped that were on the vocabulary test. Some students may have had prior knowledge of the words or may have encountered them earlier in the year. All students had different strengths, reading capabilities, and backgrounds available that promoted their efficacy. When the word was encountered, the teacher led a focus question as Novak (2010) used in guiding students when learning about a word. At times, a word or concept was encountered in the reading. Also, in an effort to get the concept matriculated or at least highlighted from the book and curriculum, a word may have been interjected by the teacher when he believed the concept was germane to the material being taught.

Then the students were taught how to use the master list as a reference tool. The master concept list could have been as simple as a list of social studies concepts on a sheet of paper. The concept mapping was demonstrated in the library on a Smartboard or computer using Inspiration Software (2010). The Smartboard is an interactive learning tool that can be best described as a large iPad attached to the wall. This was, in effect, a digital blackboard. When in class, this was demonstrated using chalk and the blackboard or markers and butcher paper. The students were asked to also make concept maps when completing their vocabulary assignments for homework in lieu of definitions. They could also answer the regular questions in that manner if they chose. The study concluded after the third marking period. All students were then given the vocabulary posttest. At the conclusion of the second marking period, pretest and posttest scores were compared to see if there was an increase in the students' performance. The intent of this was for the subjects to exhibit growth, indicating that there was improvement in performance. Improvement would be exhibited as an increase on their vocabulary posttests in relation to their pretests. Hence, if the statistics were higher after implementation of concept mapping, this indicated that the treatment had a positive effect.

### Data Analysis

To analyze the data, scores were entered into Predictive Analytic Software for Windows (IBM, 2009). Descriptive statistics were extracted in order to show the sample characteristics and research variables. Means, standard deviations, minimum, and maximum values were used to characterize the research variables. Graphs and figures were supplied in order to substantiate the results. For this study, a quantitative approach with a one-group pretest-posttest design yielded the results to be measured. This design included a pretest measure followed by a treatment and posttest for a single group. The study involved a dependent sample *t*-test analysis. A power analysis was also conducted using G\*POWER 3.1.2 for a *t* test: difference between two dependent means, matched pairs (Faul, Erdfelder, Buchner, & Lang, 2008). A medium effect size ( $d = 0.50$ ) was selected, and alpha was set at 0.05 with power set at 0.80 for dependent sample *t* tests. Based on these calculations, the desired sample size for a dependent sample *t* test included 34 participants, but certainly, it could be more.

### Results

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At the beginning of the third marking period, students were pretested using a set of predetermined social studies concepts. Students were introduced to a strategy to assist them acquire the technical language of social studies. Students used the strategy with the set of predetermined concepts. At the end of the third marking period, the same students were posttested with the same test. The test was developed by the social studies department members at the study site. A participating teacher was interviewed about the use of concept mapping after the third marking period. The results, analyses, and relevant tables and figures are presented. One hundred and ten students and one teacher participated in the study. Data were screened for missing cases and univariate outliers. Data were assessed for missing test scores, and 13 students were eliminated. The presence of univariate outliers was tested by creating standardized residuals for the test scores and examining cases for values greater or less than the absolute value of 3.29 (Tabachnick&Fidell, 2012). No univariate outliers were found. The data from the remaining 97 participants were examined in the study.

### **Research Question 1**

Research Question 1 was the following: What are the statistically significant differences in the vocabulary scores of seventh-grade students between pretest and posttest vocabulary tests after introducing concept mapping? To assess Research Question 1, a dependent sample *t* test ( $\alpha = .05$ , two-tailed) was conducted to determine if there were significant differences between pretest and posttest vocabulary scores. Prior to analysis, the assumption of normality was assessed with two Kolmogorov-Smirnov tests. The results were not significant, indicating that the assumption of normality was met. The results of the dependent sample *t* test were significant,  $t(96) = 4.49$ ,  $p < .001$ , Cohen's  $d = 0.47$ , indicating that there was a significant difference between pretest and posttest scores: posttest scores were significantly higher ( $M = 17.78$ ,  $SD = 7.18$ ) than pretest scores ( $M = 15.64$ ,  $SD = 5.78$ ). An effect size of 0.47 indicates a small to medium difference between pretest and posttest scores (Cohen, 1988). The null hypothesis--there are no statistically significant differences in the vocabulary scores of seventh-grade students between pretest and posttest vocabulary tests after introducing concept mapping--was rejected. Figure 1 presents the means for pretest and posttest scores.

*Figure 1.* Means of pretest and posttest vocabulary scores.

### **Research Question 2**

Research Question 2 was the following: From the outcomes of the pre- and posttests, is there a pattern of word acquisitions in terms of difficulty? What words are they? To address Research Question 2, the frequencies and percentages for the number of items missed were presented for pretest and posttest. The items missed most frequently for pretest were Item 6 (75%), emigration, and 12 (77%), native. The item missed most frequently on the posttest was Item 6 (85%). Item 6 was consistently missed at pretest and posttest. In terms of largest improvement, there were 17 fewer misses on Item 4, bureaucracy, at posttest than pretest. Frequencies and percentages of the number of items missed are presented in Appendix C. Frequencies on the number of items missed are presented in Figure 2.

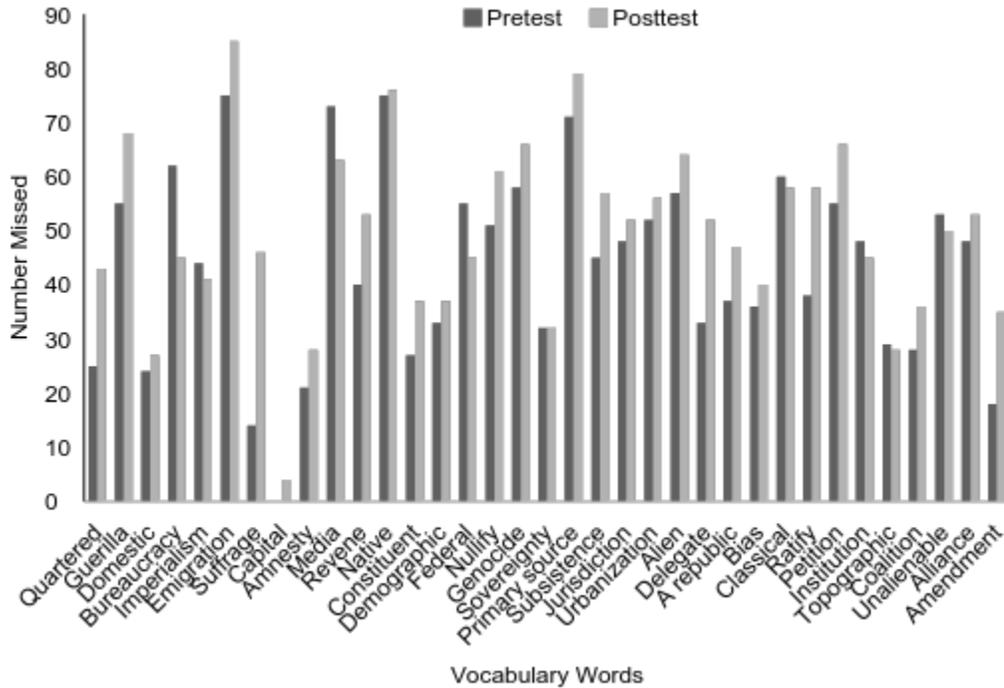


Figure 2. Number of vocabulary words missed on the pretest and posttest.

### Research Question 3

Research Question 3 was the following: What are the teacher’s perceptions about the use of concept maps as a tool for teaching vocabulary in a social studies class? To address Research Question 3, the responses to the three open-ended instructor interview questions were presented. Only one instructor responded. The first question was the following: “How do you like concept mapping as a teaching strategy?” The teacher responded, “I think it is an interesting concept.” The second question was the following: “Do you think you will use this strategy again?” The teacher responded, “Perhaps.” The final question was the following: “What did you like or not like about the strategy?” The teacher responded, “It can only work with subjects with which students are already familiar.”

The results showed overall that there was a benefit of using this strategy. From Research Question 1, there was an increase in scores when using this strategy. The results for Research Question 2 showed that there were frequencies of words that were often missed. Results for Research Question 3 provided limited information but showed that the strategy was a viable option for use in a social studies classroom from responses to questions from the instructor.

### Elaborations and Interpretations of the Results

For Research Question 1, there was a significant gain in vocabulary from pre- to posttest overall. The value showed for the invariable a standard deviation of 3.29. Any number above that number would be known as an outlier. The *p* value was .001, and this indicated that there was a significant difference. There was a higher *t* value, and it was lower than the *p* value. The *p* value difference had averages of 15.64 for the pretest and 17.78 for the posttest. This was an obvious increase in posttest scores. However, this researcher was hoping for larger numbers to this statistic. The Cohen’s *D* was 0.47, and this means that there was a small to medium difference, medium being a 0.5 difference. Again, it was the hope that the number would be greater and over 0.5 so one could claim at least a medium growth level in vocabulary acquisition.

For Research Question 2, there were several words that posed a problem for students. This researcher believed Item 8, the word *capital*, would be difficult, and it was. Students rarely got this correct pre- or posttest. If one examines Appendix C, there was minimal success with that particular word. Frequencies and percentages for the number of items missed are presented for pretest and posttest in Appendix C. The items missed most frequently for pretest were Item 6 (75%), the word *emigration*, and Item 12 (77%), the word *native*, and these were the words with

which students seemed to have difficulty. Item 6 was missed the most frequently on the posttest. If one examines improvements, there were 17 fewer misses on Item 4, the word *bureaucracy*, at posttest than pretest. Frequencies on the number of items missed are presented in Figure 2.

The results for Research Question 3 were inconclusive because there was only one participant in the interview. There were only two people in the social studies department, one of whom was the researcher. There were three open-ended questions for the interviewed teacher. That interview instructor thought that it was an interesting strategy that they may be used again. That teacher said that it can only work with subjects with which students were already familiar. In the case of this researcher, concept mapping will be implemented and used for acquiring vocabulary. The other instructor was a little reluctant to use this strategy but was successful in providing the instruction. Results of the data did indicate that students were successful using this strategy.

### **Conclusions and Summaries**

The overall results show that concept mapping was a viable way to teach students vocabulary. Teachers must use any strategies necessary to teach direct vocabulary instruction in technical subjects. There has not been enough research in the field of direct vocabulary instruction in technical subjects like social studies, science, or mathematics. The study was also an attempt to raise awareness for direct vocabulary instruction in technical subjects like social studies and science. Educators must explicitly target the vocabulary of a given subject and teach it to students in a manner that assists their learning.

### **Findings Linked to Relevant Research**

Ausubel's (2000) notion that students can learn using concept maps and Gowin's (1981) development in the subject made this a viable option for educators. Students did in fact acquire vocabulary in this dissertation study, demonstrating what Ausubel (2000) and Gowin indicated. Research by Gowin, Robinson et al. (2006), Brown (2007), and Frye et al. (2009) showed that students excel using concept maps for reading comprehension and vocabulary acquisition.

Robinson et al. (2006) reported that there was a relationship between mapping and increasing social studies vocabulary. Brown (2007) made the case for the use of concept maps when understanding social studies relationships. Frye et al. (2009) claimed that engaging in interactive comprehension activities helps comprehension and understanding of social studies content for students. Smith (2003) discussed how concept mapping was a technique that inspired young readers to build their vocabulary. Fisher and Blachowicz (2007) called for students to become more word aware and stressed the use and pursuit of defining a word no matter the subject. They also claimed that what has not been addressed thoroughly was how to think, know vocabulary, and know how to learn it. Harmon and Wood (2008) said that "middle level students need to engage in metacognitive thinking about what they do and do not understand as they encounter unfamiliar vocabulary" (Metacognition Is an Important Aspect of Vocabulary Learning section, para. 1). This dissertation aimed to examine and answer what researchers Fisher and Blachowicz and Harmon and Wood asked. It was difficult to find a study that found success in the acquisition of vocabulary in social studies until now.

### **Implications of the Findings**

The study has raised the vocabulary awareness of this educator's social studies department. The use of concept maps will continue. A vocabulary pre- and posttest will be administered each marking period. In addition, department members have determined that a set of words will be provided for mastery each semester. Other vocabulary strategies will be used to augment vocabulary growth and acquisition in social studies classes.

The researcher hopes that teachers will take direct vocabulary instruction seriously and aim to use this strategy more frequently. This strategy could be used in social studies and other technical subjects, such as mathematics. There were no established standardized sets of social studies concepts students were expected to know, and this absence was a problem. This absence has been exposed. Students who do not know integral concepts that belong to a subject will have difficulty in the future as the subject becomes more complex. This study aimed to influence and contribute to current research by highlighting what standard of vocabulary was necessary for all students to grasp the material, provide a strategy to help acquire vocabulary, and provide a way of testing for that strategy.

### **Recommendations for Future Research**

The study should be replicated on a larger scale to various grades in middle and high school. The study should also be conducted over more than one semester. It should be replicated in other content-rich subjects like

science and mathematics to see if there are similar results in vocabulary acquisition. Mathematics would be a candidate because there are technical terms in the subject, and it does not fit the traditional paradigm of word work because it is a subject dominated with numbers. Some may be apprehensive about the fact that vocabulary strategies are being used to teach about numbers. However, mathematics is conceptual and may benefit from explicit vocabulary instruction.

In summary, this was a strategy that has been used before but predominately for reading comprehension. Little if any direct vocabulary instruction in vocabulary acquisition has been used in social studies. With the call for CCLS and a focus on direct vocabulary instruction, this is a viable tool for vocabulary acquisition in social studies. There are limitations with this study, but they are limitations that warrant more research with more participants and in other subjects because this study demonstrated success.

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Frequencies and Percentages on the Number of Items Missed ( $N = 97$ )

Item	Word	Pretest		Posttest		Difference
		No.	%	No.	%	
1	Quartered	25	26	43	44	18
2	Guerilla	55	57	68	70	13
3	Domestic	24	25	27	28	3
4	Bureaucracy	62	64	45	46	-17
5	Imperialism	44	45	41	42	-3
6	Emigration	75	77	85	88	10
7	Suffrage	14	14	46	47	32
8	Capital	0	0	4	4	4
9	Amnesty	21	22	28	29	7
10	Media	73	75	63	65	-10
11	Revenue	40	41	53	55	13
12	Native	75	77	76	78	1
13	Constituent	27	28	37	38	10
14	Demographic	33	34	37	38	4
15	Federal	55	57	45	46	-10
16	Nullify	51	53	61	63	10
17	Genocide	58	60	66	68	8
18	Sovereignty	32	33	32	33	0
19	Primary source	71	73	79	81	8
20	Subsistence	45	46	57	59	12
21	Jurisdiction	48	49	52	54	4
22	Urbanization	52	54	56	58	4
23	Alien	57	59	64	66	7
24	Delegate	33	34	52	54	19
25	A republic	37	38	47	48	10
26	Bias	36	37	40	41	4
27	Classical	60	62	58	60	-2

28	Ratify	38	39	58	60	20
29	Petition	55	57	66	68	11
30	Institution	48	49	45	46	-3
31	Topographic	29	30	28	29	-1
32	Coalition	28	29	36	37	8
33	Unalienable	53	55	50	52	-3
34	Alliance	48	49	53	55	5
35	Amendment	18	19	35	36	17

*Note.* Percentages may not total 100 due to rounding error.