Winter 2-27-2020

The Type of Questions Being Promoted in a 10th Grade Social Studies Textbook

Christie A. Vanderhook
Seton Hall University, cvanderhook@optonline.net

The Type of Questions Being Promoted in a 10th Grade Social Studies Textbook

Christie A. Vanderhook
Seton Hall University

Dissertation Committee

Dr. Christopher Tienken

Dr. Wendiann R. Sethi

Dr. Gerald Fitzhugh, II

Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education

Department of Education, Leadership, Management and Policy
Seton Hall University
2020

COLLEGE OF EDUCATION AND HUMAN SERVICES
SETON HALL UNIVERSITY

APPROVAL FOR SUCCESSFUL DEFENSE

Christie Vanderhook has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ed.D. during this **Spring Semester 2020**.

DISSERTATION COMMITTEE
(please sign and date beside your name)

Mentor:
Dr. Christopher Tienken _____ 2/27/2020
Date

Committee Member:
Dr. Wendiann Sethi _____ 2/27/2020
Date

Committee Member:
Dr. Gerald Fitzhugh _____ 2/27/2020
Date

The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

Abstract

The importance of questioning is a crucial skill for the 21st century learner. The importance of having questioning designed to develop higher order thinking is critical. Much of today's educational research notes the importance of the competitive skills and knowledge students must obtain in order to be successful academically in college entry courses, in vocational training programs, and ultimately, when navigating the real world. Questioning within the classroom setting can help students develop critical thinking ideas, scaffold classroom discussions, and guide students to an advanced level of cognition. Through the skillful art of questioning, teachers can establish students' prior knowledge while simultaneously identifying the gaps in knowledge. In an effort to foster critical thinking, an environment must be created that encourages students to take risks and support critical thinking while both valuing and rewarding it as well. School environments must create mini-critical societies in their classrooms based on open mindedness, empathy, truth, autonomy, rationality, and self-criticism. When classroom environments are created that support critical thinking, students learn to believe in the power of their own ability to identify and solve problems independently. Students also begin to learn the efficacy of their own thinking and therefore, thinking for themselves becomes something they do not fear but rather embrace. In an attempt to expose students to higher order thinking, the New Jersey Student Learning Standards (NJSLS) have embedded these types of skills into the state teaching standards. Research suggests that a majority of the questions being asked are lower cognitive questions that would generally be placed on the lower level of Bloom's Taxonomy known as Knowledge or Remember. These types of questions are mostly fact based, closed, direct, recall related and questions that measure knowledge which are not promoting higher order or critical thinking. *"The New Jersey Student Learning Standards were developed with the intent to*

encourage problem solving, critical thinking, reasoning, and real-world application in order to prepare students for the workplace and are expected to be embedded consistently in classroom practice and learning" (NJDOE, 2019). This research design utilized a mixed method, including qualitative content analysis using the Hess Cognitive Rigor Matrix to code the type of questions being asked on tests and quizzes in a 10th grade social studies textbook.

Keywords: critical thinking, teacher questioning, higher order thinking, 21st century skills, cognitive complexity, metacognition

DEDICATION AND ACKNOWLEDGEMENTS

"Anything is walking distance if you have the time." A friend shared this statement with me more than 30 years ago. This phrase has been a source of inspiration for me throughout my life. I began my career in public education as a secretary to the superintendent from 1991-2001. Those 10 years were the most instrumental in achieving this goal. During that time, I began studying to become a teacher. While working full time and attending college part time, I managed to graduate Cum Laude in four short years. This was a huge accomplishment for me at the time.

Shortly after, I obtained an elementary teaching position. After eight years of teaching, I was appointed to the position of grammar school principal. Although this journey has lasted 26 years, I know that my educational path is still not complete.

I am grateful for my parents for their endless love and support. My father taught me how to be a warrior and never give up. My mother taught me how to love people unconditionally and see the best in everyone. They have truly been a lifelong inspiration.

I am beyond grateful to my husband Brian who has supported my dreams and goals since the day we met. He has always believed in my dreams and most importantly, believed in me.

I am also thankful for my amazing group of lady friends, Danielle, Jenny, Dria, Carrie, Kelly and Lisa. These ladies are the true rock stars in life, and I am so beyond blessed to be a part of their lives. We have always been there to remind each other what strong women are truly capable of.

I would also like to acknowledge my mentors throughout the dissertation process, Dr. Christopher Tienken and Dr. Gerald Fitzhugh, who I am beyond lucky to have been given the opportunity to work with. They are both such renowned professionals in the field of education.

Throughout this entire process, they have not only kept me on track, but provided me with motivation to move forward in my research with much persistence, determination, and, most importantly, confidence. They opened my mind to new ideas in education, and I would have truly been lost without them. I greatly value their insight and support, and I have learned so much throughout my time working with them. I will forever be grateful to them for helping me achieve this life-long goal. Additionally, I would be remiss if I did not acknowledge the tremendous amount of support and inspiration shown to me by Dr. Theodore Creighton. Without his vast knowledge and experience of APA editing, I do not know what would have become of this dissertation. Dr. Creighton, I hope to one day meet you so I may thank you in person for all you have done for me.

Lastly, I want to thank my children, Jeremy and Joshua for inspiring me to achieve my dreams. Regardless of how hectic our lives became, they were supportive and respectful of my goals. You understood when I needed to temporarily remove myself from our family activities to continue with my school work. I hope that through this process I have modeled for you what it means to set goals and achieve them. I hope that I have shown you that through determination and drive anything is possible. I hope that through the work I have accomplished I have paved the way for you both to achieve even more in your lifetime than I have. Most importantly, I hope that I have represented the true meaning of how "anything is truly walking distance if you have the time." All of my love, Mom.

TABLE OF CONTENTS

LIST OF TABLES

List of Figures

CHAPTER 1
INTRODUCTION

Background

According to the New Jersey Department of Education NJDOE (2019), the New Jersey State Board of Education adopted the state's first set of mandatory academic standards in 1996. These standards were called the New Jersey Core Curriculum Content Standards (NJCCCS). These content standards were developed in an effort to help describe what students should know and be able to do at each grade level and upon completion of a 13-year public school education. Since then, these academic standards have provided the groundwork for New Jersey's local district curriculum, which is used by teachers as a guideline when preparing for their everyday lessons.

The New Jersey curriculum standards, which are estimated at being revised every five years, provide local school districts with expectations for student output in nine content areas. The original NJCCCS were developed and reviewed in 1996 by panels of 200 educators, parents, business persons, and other citizens in the community. According to the NJDOE website (2019), the creation of competitive standards was inevitable as a result of the age of bursting knowledge and ever-changing technology, information exchange, and communications. As a result of these rapid changes taking place in our society, the demand for internationally competitive workers, and for an educational system designed to meet that demand was crucial. In the near future, these students will eventually be employed through the middle of the 21st century and will require an advanced level of knowledge and skill. To gain and retain high-income employment that provides job satisfaction, students will also need to continually build upon their knowledge base by being lifelong learners.

According to Tienken (2017), the original set of NJCCCS and state mandated standardized tests were implemented as a result of New Jersey's former governor, Christine Todd Whitman. During Whitman's time in office her administration lost a public-school funding lawsuit, known as *Abbott v. Burke*, (1985) which prompted the courts to charge them with the task of determining how much a "thorough and efficient" education would cost in New Jersey to meet the resource input mandates in the Comprehensive Educational Improvement and Financing Act (known as CEIFA). CEIFA was a school funding formula in New Jersey that focused on schools located in New Jersey's lowest socioeconomic areas, which argued that the children in these areas were not being offered the input necessary to provide them with a thorough and efficient education (p. 15).

The creation of content standards was also, in part, as a result of such historical court cases, such as *Brown v. Board of Education*, (1954) and *San Antonio Independent School District v. Rodriguez*, (1973) to financially define a state sponsored education. In New Jersey, education is judged against the "Thorough and Efficient Education" mandate, as guaranteed in 1875 by the New Jersey Constitution. Currently, the standards are intended to prepare students for college and careers in tomorrow's world by highlighting the focus on the much needed high-level skills, such as critical thinking, creativity, and communication (NJDOE, 2019).

Since 1996, the New Jersey state standards have been revised and renamed several times. For example, in June 2010, the New Jersey State Board of Education adopted the Common Core State Standards (CCSS), which replaced the original NJCCCS. The CCSS present content expectations for English Language Arts and mathematics. They also include expectations for the infusion of English Language Arts content into the humanities but there are no specific CCSS for subject matters such as history. The CCSS underwent another review in New Jersey in 2015,

which produced minor changes that were adopted by the State Board of Education on May 2016. Additionally, Next Generation Science Standards (NGSS), also national standards, were adopted by 26 states, including New Jersey, the Lead State Partners in 2014. The NJDOE website offers guidance for all nine fields of K-12 content areas: Life and Career, 21st Century, Integral Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, and World Languages.

Social studies education, according to the NJDOE website, has been fully updated to encourage 21st century students to participate in borderless learning using modern technology. This creative method enables students to observe historical events, almost by transcending the time and location limits. Through this extension of learning networks, educators, and other students around the world are now in a position to participate in digital collaboration. Students in New Jersey now have the chance to develop a deeper understanding of our international society through the teaching of social studies. At the same time, the understanding of American democracy and nationality's fundamental principles and values provides the conceptual framework that enables them to make informed decisions on issues and challenges, locally, nationally, and internationally (New Jersey Education Department, 2019).

The NJDOE website also states that it is the intent of the social studies standards for all students to receive social studies instruction from preschool to grade 12. The challenges of education of the 21st century are complex, global, and connected to people, places, and past events (NJDOE, 2019). In order to prepare New Jersey students to become 21st century employees, they must be exposed to authentic learning experiences, enabling them to apply content knowledge, develop citizenship skills, and work with students from all over the world. The natural integration of engineering in curriculum in social studies (Social Studies Learning

Guidance of the New Jersey, 2009) allows students to overcome geographic borders, apply scientific and mathematical analysis to historical and contemporary issues, recognize cultural diversity, and experience events by examining primary sources. That aspect focuses on a profound understanding of concepts that allows students to think objectively and systemically about local, regional, national, and global problems (p. 1).

Higher Order Thinking

Higher order thinking (HOT) is typically referred to as thinking on a level that is higher than memorizing facts or retelling something the way it was told. When students memorize and give back information without having to think about it, this is known as rote memory. This type of thinking is much like a robot, that does what is programmed and does not require critical thinking. Higher order thinking takes thinking to higher levels than simply restating facts. HOT requires students to do something with the facts presented to them. Students are required to understand, infer, make connections to other facts and concepts, categorize, manipulate, and put facts together in new ways in an effort to seek new solutions to new problems.

An essential skill, such as questioning, is an important component of the teaching and learning process. Questioning as an educational strategy can help the teacher develop critical thinking skills, support in-depth discussions, and progress students to a higher level of cognition (Lennon, 2017). Tofade, Elsner, and Hanies (2013) stated that using questions as a strategy to teach is an age-old practice and has been the cornerstone of education for centuries. Asking the right questions verbally, and in the form of written prompts at the appropriate time, is not innate, rather, a skill that must be researched and developed by the teacher. Research indicates that while posing lower-level questions requiring recall and rote memory has some value initially, these questions do not effectively stimulate critical thinking. The American Heritage Dictionary

(online) defines a question as “a sentence, phrase, or gesture that seeks information as a reply.” We already know that teachers ask the majority of the questions in a classroom, and research reveals that most of their questions have little impact on learning, since they focus mainly on lower-level questions requiring recall, which does not promote higher order thinking skills.

Frameworks of Higher Order Thinking

There are two frameworks that have been historically used to identify the type of thinking that is being promoted within classrooms: (1) Bloom’s Taxonomy (Revised) and (2) Webb’s Depth of Knowledge (DOK). Karen Hess and colleagues developed another framework in 2005, the Hess Cognitive Rigor Matrix (CRM), which combines the two existing models for describing rigor and deeper learning.

Bloom’s Taxonomy, developed by Benjamin Bloom in 1956 and revised by Lorin Anderson in 2000, is a framework used to classify learning based on different cognitive rigor and complexity. Bloom’s Taxonomy (Revised) is usually presented in a triangle with the higher cognitive processes located on top. The levels of complexity are based on actions and contain six levels of complexity, ranging from the most basic task of remembering information to the highest level of creating. As displayed in Figure 1, the levels are Creating, Evaluating, Analyzing, Applying, Understanding, and Remembering.

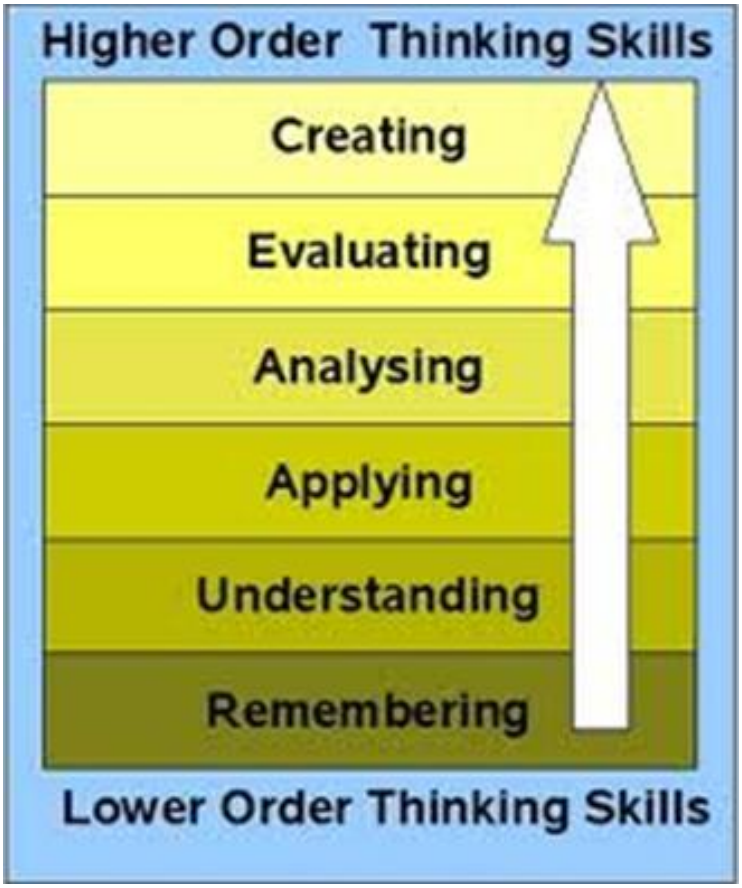


Figure 1. Levels of complexity (Anderson and Krathwohl, 2001).

Another framework is Webb's Depth of Knowledge developed by Norman Webb in 1997. This framework is a model used to analyze how deep students must think to answer questions and complete activities. Webb's DOK is a way to think about content complexity rather than content difficulty. This model is usually presented in a four-level circle. These levels include recall and reproduction, skills and concepts, strategic thinking/reasoning, and extended thinking.

Completed in 2005, the Hess Cognitive Rigor Matrix is the latest tool developed by Karin Hess that blends Bloom's Taxonomy with Webb's Depth of Knowledge levels. Hess designed this matrix to assist teachers in recognizing what cognitive rigor might look like in the classroom. Not only does the Hess Cognitive Rigor Matrix help educators apply cognitive rigor

to their daily lessons, but it also guides test developers in designing test items and performance tasks. The Hess Cognitive Rigor Matrix was designed with content specific descriptors in each level that are used to categorize and plan for the multiple levels of thinking, analysis, and mental processing required of assessment questions and learning tasks. For this study, the Hess Cognitive Rigor Matrix will be utilized to determine the type of thinking that is being promoted in a 10th grade social studies textbook.

Statement of the Problem

In an effort to revise the original NJCCCS, the State Board of Education adopted the New Jersey Common Core Standards (NJCCS) in 2010. The Common Core Standards were created to promote higher level thinking by implementing the use of higher order thinking questions that are open ended, interpretive, evaluative, analytical, inquiry based, inferential and synthesis based. According to recent research articles, questioning is the key component that allows teachers to uncover what students already know, identify gaps in knowledge, and scaffold the development of their understanding in an effort for them to attempt to close the gap between what students already know and the learning goals. Dr. Judith Nappi, (2018) asks "So why is it that with more than 60,000 questions being asked in one classroom on a yearly basis, only approximately 12,000 encourage students to engage in higher order thinking?" (p. 30)

Effective questioning is crucial for teachers to plan and develop higher order level interactions for students that are structured and purposeful. Tienken, Goldberg, and DiRocco (2009) focused on the procedures of questioning and noted differences in the cognitive processes the brain uses when students are asked recall or lower-level questions as opposed to being asked higher-level questions that required students to analyze, synthesize, evaluate, categorize, and/or apply information has been found to be particularly advantageous to student learning, yet higher-

level questions are rarely used (Peterson & Taylor, 2012; Tienken, et al., 2012). Tofade, Eslner, and Hanies (2013) stated the possibility that teachers simply do not value higher order questions and feel they are not effective. Perhaps teachers lack the formal training on how to formulate and develop higher-level questions to stimulate learning. Tienken, Goldberg, and DiRocco (2009) reported that "results from empirical research have shown that during observations of classroom-based questioning, lower-level questions are more frequently used than high-level questions that promote critical thinking" (p. 31, Nappi).

Students who engage in higher order thinking go beyond the basic levels of comprehension of a text. Once students engage in higher order thinking, they are reading at complex levels requiring the analyzing, synthesizing, evaluating, and interpreting of text. Students can process text at deeper levels, make judgments, and detect shades of meaning. Students can also make critical interpretations and demonstrate high levels of insight and sophistication in their thinking. Students are able to make inferences, draw relevant and insightful conclusions, use their knowledge in new situations, and relate their thinking to other situations and to their own background knowledge. These students fare well on standardized tests and are considered to be advanced. Indeed, these students will be prepared to function as outstanding workers and contributors in a fast-paced workplace where the emphasis is on using information rather than just knowing facts.

Because many high-paying jobs in the 21st century will require employees to use the four highest levels of thinking, which are application, analysis, synthesis, and evaluation, it is all the more important for educators to promote higher order questioning within the classroom to stimulate critical thinking. The previous economic focus on 19th century skills for the industrial revolution has shifted to competencies associated with creativity, innovation, and

entrepreneurship (Wagner, 2008; World Economic Forum, 2013). According to Tienken (2017), "It is now a focus on diversity of talents, not the homogenization of talent that is necessary for the uncertain future. The U.S. economy is vastly more diversified than it was at the turn of the nineteenth century and a wider range of skills and dispositions are necessary" (p. 44).

Purpose of the Study

The purpose of this case study with mixed methods was to determine how the language of written question prompts and activities in a 10th grade social studies textbook series, associate with the language of higher order thinking found in the research literature. The research employed a mixed-method approach with qualitative and quantitative content analysis methods. Specifically, the language from question prompts for all tests and quizzes given in a 10th grade social studies textbook were analyzed and compared with the language associated with higher order thinking found in the research literature.

Research Questions

The study was guided by the following overarching question: What are the types of thinking being promoted in a 10th grade social studies textbook?

The following two questions guided the specific inquiry of the study, as follows:

1. In what way(s) does the language found on tests and quizzes of a 10th grade social studies textbook associate with language that promotes higher order thinking found in the research literature?
2. What is the frequency and percentage of higher order thinking, as described by the Hess Cognitive Rigor Matrix, embedded in social studies questions presented on 10th grade tests and quizzes from one textbook series.

Methodology Overview

For the current study, all 287 questions were analyzed from a 10th grade social studies textbook series, specifically, U.S. 1 History, chapter tests and quizzes, that have been aligned with the New Jersey Student Learning Standards (NJSLS). Two coders collected data by reviewing each selected question and aligning it with the language found in the various cells of the Hess Cognitive Rigor Matrix. After all questions were aligned, the two coders compared the frequency and distribution of selected questions within the Hess Cognitive Rigor Matrix, focusing on the frequency of questions that fell into the category of higher level thus requiring higher order thinking skills. Similarly, a focus was also on the frequency of questions that fell into the category of lower-level questions requiring students to simply recall or reproduce. This study is composed of a mixed-method research, with an emphasis on quantitative statistics, to explain the percentage of questions that fall within the cell of the Hess Cognitive Rigor Matrix.

The Hess Cognitive Rigor Matrix and 10th grade social studies assessments were selected as the focal points of this analysis study. Consequently, the grade level equivalency was selected predicated on the lack of specific research in high school 10th grade social studies, particularly in the area of U.S. History 1 curriculum. A further explanation of the coding scheme and procedure will be provided in Chapter III.

Conceptual Framework

The Hess Cognitive Rigor Matrix was employed as the conceptual framework for the present study. The Hess Cognitive Rigor Matrix created an alignment between Bloom's Taxonomy and Webb's Depth of Knowledge, identifying each of the different levels and presenting a more concise focus for educators when determining the type of language found on tests and quizzes and its association with language that promotes higher order thinking.

According to Hess, Carlock, Jones and Walkup (2009), "Cognitive rigor encompasses the complexity of content, cognitive engagement with that content, and the depth and scope of the planned learning activities" (p. 12). The Hess CRM was developed with the intention to be an educational tool that would enhance assessment planning and instructional practices at the classroom level (Hess, Carlock, Jones, & Walkup, 2009). Using the Hess CRM provided a means of analyzing the language being used on tests and quizzes and determining if this language promotes higher order thinking.

At the lowest level of the Hess Cognitive Rigor Matrix is where Bloom's remember or recall facts and Webb's Level 1: recall and reproduction align. At both of these levels, the goal is to recall basic facts and concepts through rote memorization. The second level of Bloom's Taxonomy is understanding, which is found at each of the four levels of Webb's Depth of Knowledge. Because the Hess Cognitive Rigor Matrix is a blend of both Bloom's and Webb's DOK it provides a look at both the level of cognitive complexity an activity requires and the tasks associated with a particular level of understanding. Using this educational tool, educators are able to more accurately analyze and differentiate learning tasks, resulting in the creation of more effective lesson plans. Educators can now effectively foster deeper levels of learning by challenging students to use information in new and complex ways. In 1956, Benjamin Bloom developed his original taxonomy as a way to classify intellectual behavior that he believed was important in learning and assessment. In 2001, Bloom's Taxonomy was revised applying dimensions of cognitive processes by changing the previous nouns, like knowledge to verbs such as "remember," in an effort to articulate educational objectives. This restructuring of the original taxonomy recognizes the importance of the interaction between the content taught and the thought processes used in learning, for example, specifying what students need to do. Even the

Bloom's Taxonomy Revised has some shortcomings, as sometimes verbs/processes can seem similar in differing levels; and thinking processes, even at higher levels, do not necessarily translate to deeper understanding of content. Bloom's Taxonomy categorizes activities based on their level of cognitive complexity, but it does not define the types of thinking necessary to process information during a given activity. Webb's DOK defines the depth of understanding that is demonstrated based on the complexity of tasks within an activity.

Schools in the 21st century must prepare students by exposing them daily to basic and complex activities. Today's students must be provided with a curriculum that spans a wide range of the cognitive rigor matrix (Hess, 2009). By working with the Bloom's model alone, two tasks may fall into the same category and seem very similar, with little to distinguish them, though they may vary greatly in rigor and complexity. Because higher order thinking is regarded as a crucial component of 21st century learning, there is a necessity to analyze the learning tools provided for students (Fitzpatrick & Shultz, 2016). Developing effective objectives and learning goals are essential to establishing a pedagogical exchange, so that both teachers and students understand the purpose of the exchange. By doing this, educators can ensure that they are planning and implementing appropriate instruction, designing valid assessment tasks and strategies, and aligning their instruction to state standards. By using the Hess CRM instead of solely using Webb's model or Bloom's Taxonomy, a more accurate assessment of the type of thinking skills required by students when responding to the language found on social studies tests and quizzes can be made.

Significance of the Study

With new standards embedded into the NJSLS, CCSS, NJCCCS, educators are constantly faced with the challenge of enhancing and developing higher order thinking skills among students in an effort to prepare them for 21st century demands. Previous studies have been conducted utilizing Webb's Depth of Knowledge in order to evaluate complexity of thinking in regard to the CCSS. Research indicates that the educational standards alone will not bring rigor into the classroom. The purpose of this study is to extend research in the area of social studies and New Jersey State Standards, as there is little research regarding this topic. Conducting research in this area will provide educators with the resources necessary to develop the curriculum and assessments and to promote classroom discourse aligned to higher levels of cognitive demand. This body of work intends to examine the language found on tests and quizzes of a 10th grade social studies textbook and how that language associates with higher-order thinking. This study offers examples of the Hess Cognitive Rigor Matrix employed to analyze the cognitive expectations demanded by standards and assessment tasks. Assessment language will be categorized based upon the cognitive demands required to produce an acceptable response.

Limitations

As with any research project, limitations exist that the researcher cannot control and will place restrictions on the methodology and conclusions. The design of this case study is a one textbook study and focuses only on 10th grade assessments and quizzes. The results are not generalizable to other schools, grade levels, or textbooks. The results are only applicable to the school, subject, textbook, and grade levels studied. Another limitation is that only two coders were used. Three coders would have provided a higher level of reliability.

Delimitations

Delimitations of this study include grade levels and subject matter selected. The study focused specifically on U.S. History 1 in grade 10. The researcher chose to examine questions in the subject of social studies. Other content areas will not be studied in this high school. Another delimitation could be the number of questions analyzed. Only questions that are aligned to the NJSLS and NJCCCS were selected. Individual student learning styles were not examined, or teaching styles of individual teachers, and, finally, school culture, which all play a significant role in affecting student learning. It must be mentioned that the majority of my own teaching and leadership experience has been primarily working with students in grades pre-k through 5, and thus my familiarity with high school content and question prompts is limited. Another delimitation of this study was the researcher's choice to only analyze test and quiz questions in grade 10. This study only reviewed questions presented on tests and quizzes from a 10th grade social studies textbook used within one district. Results cannot be generalized to other schools and districts.

Definitions of Terms

Cognitive complexity is the difference of responses, including the type and level of thinking and reasoning, that is given to particular stimuli, such as a question or problem (Bieri & Blacker, 1956).

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend

subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence good reasons, depth, breadth, and fairness (Scriven & Paul, 1987).

Higher level cognitive questions are those that invite students to manipulate bits of information previously learned to create and support an answer with logically reasoned evidence.

Higher order thinking is the incorporation of reasoning and judgment, as well as intellectual empathy, fair mindedness, and persistence, to complete tasks and solve problems (Shultz & Fitzpatrick, 2016).

Lower level cognitive questions are more basic and often asked mostly by teachers. These questions simply ask students to recall word-for-word material previously presented — rote memory. Lower cognitive questions are generally fact based, closed, direct, recall related and questions that measure knowledge. Much research has been done in an effort to determine which types of questions are most effective in the classroom.

Teacher questioning is typically referred to as the interaction between the teacher and learners and often viewed as the most important feature of the classroom. For teachers, questioning is a critical skill that anyone can learn to use well if modeled appropriately. Teacher questioning, when skillfully planned, is a way of helping students develop their own ability to pose and formulate questions that engage students in authentic classroom discussions (Nappi, 2016).

Organization of the Study

Chapter II includes a literature review on the history of the type of questions primarily being asked by teachers within the classroom, theories regarding higher order thinking, and how higher order thinking has been promoted through the use of teaching questioning, tests, and quizzes.

Chapter III expands upon the overview provided in Chapter I and further explains the design methods and procedures for the study. Data collected from tests and quizzes from one 10th grade social studies textbook series will be paralleled with the Hess Cognitive Rigor Matrix.

Chapter IV organizes and reports the study's main findings, including the presentation of relevant data.

Chapter V summarizes the statistical findings and analyzes the data further through the development of implications for schools, teachers, and students who are interested in developing higher order thinking through high-level questioning. Recommendations and conclusions will also be presented along with suggestions for future research that could investigate this topic.

CHAPTER II

REVIEW OF THE LITERATURE

For this mixed-methods study, the purpose of this literature review was to critique the existing literature regarding higher order thinking and the importance of questioning in developing higher order thinking skills. The literature review will also present a review of definitions of higher order thinking in school curriculum and research literature. Additionally, this literature review identifies analyses of higher order thinking and its alignment with the Hess Cognitive Rigor Matrix.

Educational policy documents around the world currently highlight the goal of teaching higher order thinking (HOT), even more predominantly than in earlier times. This trend is reflected in numerous standards and curricular documents (Zohar, 2013). Yet, most classrooms worldwide are still predominantly characterized by a pedagogy of knowledge transmission that focuses on lower order cognitive levels. Numerous studies reveal that despite decades of efforts to implement HOT, it is still far from being a predominant way of teaching and learning. The combination of challenges of scaling up educational innovations with the challenges involved with teaching thinking, in particular, seems immense. Several researchers note that scaling up the "thinking curriculum" is a huge challenge that is still awaiting educational systems all over the world (e.g., Fullan & Watson, 2011; Osbourne, 2013; Resnick, 2010; Zohar, 2013). Accordingly, despite the abundance of research about small-scale efforts to teach thinking, there is still a gap in the research literature about how to scale up the efforts across many schools and whole educational systems (Cohen & Zohar, 2016).

Literature Search Procedures

The literature search process included the gathering of work in line with my purpose for this study. Through the process of reviewing multiple sources, I utilized the Seton Hall Library Database in order to research many peer-reviewed online articles relevant to my study. I was able to find additional articles utilizing EBSCO, ERIC, SAGE, ProQuest, and Google Scholar. In order to find articles aligned to my theory of thought, I keyed in search terms such as, *higher order thinking, critical thinking, social studies, Hess Cognitive Rigor Matrix, 21st century skills* and *teacher questioning.* I included peer-reviewed and non-peer-reviewed literature for keywords and statements that assisted with expanding the scope of my research and definitions of higher order thinking skills. I focused my search on peer-reviewed literature, but I did review non-peer-reviewed literature for key words and statements that assisted with expanding definitions of complex theories of thought.

Overview of Current Literature

The overview of current literature relevant to higher order thinking skills as it relates to the language found on tests and quizzes in a 10th grade social studies textbook, and how that relates to the language that promotes higher order thinking skills found in research literature, provides several themes. The first part of the literature review involves the review of the keywords *21st century skills, higher order thinking,* and *critical thinking* resulted in a plethora of substantial peer reviewed articles. The selected literature included quantitative studies that were experimental, quasi experimental, correlational, and meta-analyses. Definitions were also extracted from the literature found in these searches. Much of the mainstream education literature is written with the assumption that the audience understands higher order thinking, and the literature does not provide a specific definition.

The second part of the literature review focused on searching for literature about the significance of teacher questioning and its relation to higher order thinking skills and cognitive complexity: keywords were used including *teacher questioning, Socratic style of questioning,* and *high/low level questions,* to name a few. Much of the literature resulted in studies that focused on higher order questioning techniques and/or centered around critical thinking skills used in classrooms. Many of the studies found in these searches were small case studies, either focused on one school district or a few schools in a specific area. Some of the studies were also comparative between two districts or between two specific schools of differing demographics.

The third purpose aimed to provide relevant theories of higher order thinking and theories about how specific language found on tests and quizzes can promote this type of thinking among students.

Criteria for Inclusion of Literature

- Published peer-reviewed studies that focused on higher order thinking, critical thinking, teacher questioning
- Classic literature
- Dissertations
- Theoretical literature
- Peer-reviewed and non-peer-reviewed articles on the New Jersey Student Learning Standards and the New Jersey Common Core State Standards in social studies
- Peer-reviewed and non-peer-reviewed sources about higher order thinking and teacher questioning
- Empirical research focused on questioning in regard to higher order thinking skills

- Works published by theorists regarding taxonomies, frameworks, and/or models for higher order thinking

Methodological Issues in Studies of Higher Order Thinking

There were various issues regarding higher order thinking, particularly in the lack of a formal definition of higher order thinking. Similarly, many of these articles referred to critical thinking and problem solving as synonyms with higher order thinking, failing to distinguish differences between each of these terms. A lack of clarity exists between the key terms and definitions of *higher order thinking*, *critical thinking*, and creative thinking. While each definition seems to be similar in theory and/or idea, and at times, almost interchangeable, there is still an ambiguity that appears to exist here. On the contrary, there appears to be no confusion in defining lower level thinking. Much, if not all, of the research literature clearly defines lower level thinking as thinking that demands only routine or mechanical "rote" application of previously required information, such as listing information previously memorized and/or inserting numbers into a previously learned formula—basically, concluding the regurgitation of information derived from rote memory only.

To further add to the confusion of defining higher order thinking, the literature noted that higher order thinking can be viewed as subjective. Newmann makes an important point when he states that each child is an individual and each child differs in the types of problems they find challenging, therefore resulting in the conclusion that higher order thinking is relative (1990). For example, what might require higher order thinking to accomplish a task by one student, may only require another student to use lower order thinking skills. Additionally, the inconsistent use of the term *critical thinking* has further contributed to the confusion surrounding the definition of higher order thinking. The term *critical thinking* has been attached to at least three separate

meanings. For example, this term can be associated with *critical thinking* as problem solving, critical thinking as evaluation or judgement, and, lastly critical thinking as a combination of evaluation and problem solving (Lewis & Smith, 1993).

Much of the literature provided examples of higher order thinking, including specific tasks students can perform in the classroom that use higher order thinking.

Review of Literature Topics

21st Century Skills

Within the non-peer-reviewed literature, 21st century skills are commonly defined as 12 skills grouped into three categories that are intended to help students keep up with today's economy. Each skill is unique in how it helps students, but these students all have one quality in common—they are in the age of the internet. The first category is Learning Skills also known as the 4 C's, include creativity, critical thinking, collaboration, and communication. These four skills are designed for students to use throughout their lifetimes to adapt to any situation they can encounter in the workplace. The second category, Literacy Skills, includes information, media, and technology literacy. These skills all deal with students reading and understanding information online. The third category is known as Life Skills, which includes flexibility, leadership, initiative, productivity, and social skills (FLIPS). These skills students can use as they go through their lives dealing with solving problems in a variety of ways. Twenty-first century skills are to ensure that students will have the adaptive qualities necessary to keep up with a business environment that is constantly evolving (Applied Educational Systems AES, 2019).

Education trends, policies, and strategies are constantly changing in the 21st century. Students today should be able to think critically about events taking place, collaborate with peers

and adults, and use digital tools creatively to express their thoughts, instead of relying on the teacher's instruction, lecture, and textbooks. According to Suzi Boss (2019), the need for 21st century training has come to rest for over two decades as academic experts, blue-ribbon committees, legislators, and entrepreneurs started to denounce the existing stagnation of education methods. Yesterday's strategies, focusing primarily on memorizing and rote learning, will not prepare today's students for our ever-changing world, which is increasingly educated. The manner in which schools should respond to this issue is still open for discussion with many groups.

The National Education Association (NEA) is a founding member of the Partnership for 21st Century Skills, a national organization that promotes education and offers the use of tools and resources to encourage the infusion of technology in schools, districts and states. The NEA website notes that 21st century learning consists of six essential components, including an emphasis on core topics, learning skills, the application of tools for 21st century learning, teaching and learning in a 21st century context, the teaching and the learning of new contents of the 21st century, and the use of 21st century assessments to measure core subjects and skills.

Likewise, a coalition of business leaders and educators, the U.S-based Partner of 21st Century Skills (P21), proposed a 21st Century Learning Framework, which identified essential skills and knowledge that students must have to succeed in the workforce and life, as well as the support systems necessary for the outcomes of 21st century Learning. Those basic skills include the "4C's" acronym. The 4C's contribute to communication, collaboration, critical thinking, and creativity to be learned within the core areas and trends of the 21st century. It is essential to note that the importance of many of the skills and structures presently in demand for organizations, like the Alliance for 21st Century Skills, were illustrated by John Dewey over 100 years ago

(1899; 1902; 1916; 1929). Almost all the skills and dispositions commonly referred to as 21st century skills have indeed remained timeless. Dewey's (1916) statement, "Learning is a social process, learning is growth, education is not preparing for life, but for life itself" (p. 239) is, for example, related to 21st century skills that are currently focused on in education. When carefully looking at Dewey's argument, one can infer that he applies to the 4C's teaching. Dewey has criticized traditional education in his novels, that are typically focused on how to teach young children. He promoted "hands-on and mind-on" learning experiences, and a curriculum that promotes critical thinking, problem solving, imagination, interaction, and collaboration, all based on 21st century skills. Today, our educational situation is very different and much more complex than it was in 1900, but Dewey and his colleagues launched a campaign that, for 50 years, had a huge impact on public education in the United States. Dewey's vision and ideas for education set the stage for many of today's educational strategies such as project learning, inquiry-based instruction, flipped classrooms, spaces for builders, interdisciplinary study, differentiated training, and even STEM/STEAM.

By the 1950s, the traditional approach to teaching and learning began to dominate within the classroom and progressive education movement was lost. It makes sense, at this point, to pay close attention to any of the lessons John Dewey taught us that promoted and sustained educational change in K-2 classrooms (Hoisington, 2016). Most of these ideas that Dewey wrote about were in the late 19th and early 20th centuries, and yet, as educators we can still learn much from them today. In today's times, technology and society moves so fast that one of the major challenges is providing students with the necessary skills before students graduate high school. Many of Dewey's educational ideas were well ahead of their time for example, establishing an educational philosophy encouraging continuous learning has never been more

needed.

According to Larson and Miller (2011), "21st century skills which are defined as skills students will need for the society in which they will work and live shouldn't be thought of as "one more thing to teach," but rather training integrated across all curricula" (p. 121). Since the birth of public education, there has always been a strong emphasis on teaching basic knowledge, such as reading, writing, and mathematics. While these skills are still important, the current focus is on teaching children 21st century skills in an effort for students to be responsive to an ever-changing society. In a press release, U.S. Secretary of Education Arne Duncan (2009) referred to 21st century skills as "skills that increasingly demand creativity, perseverance, and problem solving combined with performing well as part of a team" (p. 121).

The Partnership for 21st Century Skills, which is a leading advocacy organization that promotes the infusion of 21st century skills into education, developed a framework for 21st century learning. This framework describes the skills, knowledge, and expertise students need to successfully enter today's workforce. According to Larson and Miller (2011), 21st Century Themes, Learning and Innovation, Information, Media, and Technology, and Life and Career are some of the core subjects being promoted in this framework. (Partnership for 21st Century Skills, 2009). Similarly, the International Society for Technology in Education (2007) further promotes that as students grow and develop in an increasingly digital world, they will need skills in the areas of creativity and innovation, communication and collaboration, research and information fluency, critical thinking, problem solving and decision making, digital citizenship, and technology operations and concepts in both the workplace and everyday life (p. 122).

Although there are multiple definitions of 21st century skills, they all generally focus on what students can do with the knowledge they have obtained and how they can apply that

knowledge in real-life situations. Strong communication and collaboration skills, expertise in technology, innovative and creative thinking skills, and an ability to solve problems are the reoccurring themes that today's employers are seeking (Larson & Miller, 2011).

Finally, the New Jersey Department of Education website states that in the global economy today, students need to be lifelong learners who can adjust to a changing workplace and environments that thrive. To meet these demands, the State of New Jersey created Standard 9 which describes 21st Century Life and Careers. Standard 9, outlines the 12 Career Ready Practices, establishing clear guidelines for what the students need to learn and be able to do in order to be successful and gain financial freedom in their future careers (NJDOE, 2019). NJDOE says that the goal and mission of 21st Century Life and Career Skills is to enable students to make informed decisions in an effort to participate as active citizens in a diverse global society and to successfully address mthe challenges and opportunities of the worldwide workforce of the 21st century. The vision is to apply 21st century life and professional skills through the K-12 curriculum and Career and Technical Education (CTE) to help develop a population of students who are self-reflective and focused on continual improvement of essential life and career strategies that lead to success, use effective communication and collaboration skills and resources to interact with a global society; are financially literate and financially responsible at home and in the broader community; are knowledgeable about careers and can plan, execute, and alter career goals in response to changing societal and economic conditions; and seek to attain skills and content mastery to achieve success in a chosen career path (NJDOE, 2019).

Students must have opportunities to grasp career principles and financial literacy for college and career preparation, which includes helping students to focus on their future social, employment, work, and financial goals informedly. Through incorporating Standard 9 into

teaching, students from New Jersey can gain the academic and life skills required to not only excel individually, but to also contribute to the development of our society (NJDOE, 2019).

Thinking for Reflection

Dewey (1916) believed that developing students' intellectual powers is necessary, but that this should not be the primary goal of education. Authentic schooling should prepare students to live fulfilled lives and become lifelong learners. Schooling should also prepare students to have the capability to fulfill their potential and contribute to society. Dewey was concerned that the traditional approach to curriculum and instruction was not effective in preparing students to think critically and/or solve problems. Dewey was further concerned that the traditional approach to schooling promoted passive and compliant students instead of reflective, independent, and knowledgeable decision makers. He believed that the one critical purpose of education was the development of the mind in an effort to motivate young people toward maturity and wisdom, enabling them to be effective citizens able to transmit culture from one generation to the next and transform it in the face of change. Dewey (1916) stated, "What nutrition and reproduction are to physiological life, education is to social life" (p. 14).

Throughout his writings, Dewey (1916) often highlighted the connections between democracy and education, as he was an advocate of democracy. Democracy is not just about equal voting rights, effective participation, and enlightened understanding, but it must also equip citizens with the ability to take on the responsibility to make informed, intelligent choices and decisions on behalf of the greater good. Dewey believed that democracy is not just a political system but an ethical model consisting of active and informed participation by all citizens. Established beliefs and theories should be critically questioned and revised in the light of developments, logically evolving to meet the needs of changing times. If democracy is to work it

requires informed, knowledgeable, and wise citizens resulting in education having a moral purpose. Classroom teachers and schools have a responsibility to not only teach knowledge and skills but to nurture and develop the moral character of their students.

Dewey professed that education is meant to prepare students for an uncertain future, and, as a result, a high importance should be given to developing effective habits, the learning ability to adapt to new and uncomfortable situations, and, ultimately learning how to learn. Dewey's perspective is significant considering that during his lifetime, most people's lives were relatively predictable. In the early 1900s, education was focused on preparing individuals for a particular role in a fairly predictable workplace due to mass production and industrialization. Today, in our modern globalized world it is quite the contrary, as our world is highly unpredictable. People are often feeling overwhelmed and stressed due to lack of job security and multiple careers. Coping with uncertainty has never been more significant in today's world.

Dewey viewed teachers as needing to be creative professionals, demonstrating not only an understanding of their subject matter, but a passion for knowledge, intellectual curiosity, and understanding of the learning process and the children in their care. Dewey understood that excellent teachers challenged students to think critically by posing open-ended questions requiring well-thought-out responses supported by logic. Excellent teachers also responded swiftly to students' responses as indications of their current level of understanding, a direct result of students constructing knowledge out of their own experiences.

Dewey's description of constructivism as a theory helped to explain how deep learning happens and how people know what they know. At the core of learning, thinking, and development is problem solving. As people solve problems and discover the consequences of their actions, they begin to construct their own understanding. In an effort to adjust teaching to

the individual learner, consequences, such as engaging and challenging students, connecting learning to experience, and listening to their ideas, will only enable the educator to gain a better understanding of how students think. Dewey's concern for a need to balance both the learner's interest while simultaneously developing a depth of knowledge and understanding continues to resonate today as educators still debate about how to effectively organize curriculum.

In today's uncertain global age of information, it has never been more urgent for students to understand the relationship between effective democracy and education, which was yet another one of Dewey's areas of concern. It is imperative that education focuses on providing the students with the necessary skills and abilities needed to cope with uncertainty. It is essential that students learn how to learn not just for school, but for life. Students must understand that education is a moral enterprise that has taken on the responsibility of developing informed citizens who are capable of making informed choices and decisions throughout their lives.

The concepts of creativity in education also go back to Dewey's writings (1916). Dewey has made us aware that all students must be active in comprehensive efforts to reform, and that they must "not obtain inferior education based on recitation and unwillingness to accept a disjointed body of evidence" (Orlich & Tienken, 2013, p. 5). Dewey believed in a democratic system of schools that encouraged the development and resolution of issues that would help society to move forward. Tienken and Orlich (2013) warned of a student "dual society," which allows intellectual capital to succeed in comparison to those which are not (p. 19). Standard education proponents say they will provide equal opportunities and find balance in our unbalanced education system. Nevertheless, the strong differences between autocratic standardization and democratic creative and critical thinking must be recognized to maintain a balance between learning in an effort to not create a "dual system" (Adams-Burke, 2007, p. 58).

Like Dewey, Meier (2000) was in favor of a progressive public-school system, and argues that standards "will not contribute to robust democratic lives or help our fellow citizens who are most vulnerable" (p. 2). The criteria clearly do not encourage schools to exemplify and teach, or to develop different viewpoints, "squeezing out those schools and educators that seek to demonstrate alternative possibilities and explore other paths" (p. 2).

Higher Order Thinking

The current push for 21st century learning in the classroom stresses the importance of higher order thinking, a skill that students are expected to develop throughout elementary school and their entire educational career (Sydoruk, 2018). In today's information age, thinking skills are regarded as critical in order for educated people to cope with the myriad of daily changes in the world. Many educators believe what is more important to tomorrow's workers will be the ability to learn and make sense of new information. No longer is specific knowledge useful in navigating the world around them. (Bol, Fischer, & Pribeesh, 2011).

In today's classrooms, teachers are expected to develop more than just basic skills. Lewis and Smith (2001) stated, much confusion in specifically defining the terms *higher order thinking*, *critical thinking*, problem solving, rational thought, and reasoning. During my review of literature, I became confused as well. There appears to be many variations in the definition of higher order thinking. While no one definition is exactly the same there are similarities that exist between them. For example, in my opinion, basic knowledge (Bloom's Taxonomy) or remembering (Bloom's Taxonomy Revised), which is understood as opposed to directly stated, must be present and/or mastered in order for higher order thinking to take place. According to Tienken (2017), a standardized curriculum based on teaching and learning eventually leads to convergent thinking that reduces educators and students' intellectually taking risk. This does not

mean that the traditional knowledge of basic content is not important. When used as a part of a larger, more varied approach to the curriculum that facilitates creative and complicated thinking, traditional basic knowledge of the content, such as mathematical computation or literal comprehension in reading, is important.

In an effort to define higher order thinking Cuban (1984) notes, "Defining thinking skills, reasoning, critical thought and problem solving is troublesome to both social scientists and practitioners. Troublesome is a polite word; the area is a conceptual swamp" (p. 676). Additionally, it appears that not much progress has been made in clarifying this "conceptual swamp" since Cuban's statement (Lewis & Smith, 2001). According to Brookhart (2010), higher order thinking is defined as students "being able to relate their learning to other elements beyond those they were taught to associate with it" (p. 5), for example, students having the ability to relate the content to prior knowledge or making connections outside of the curriculum. This example implies that there is much subjectivity into the degree to which a student can master this skill. Higher order thinking requires construction of knowledge through the use of disciplined inquiry, to produce discourse, or performances that have value beyond school. Brookhart identified three perspective—transfer, critical thinking, and problem solving. Higher-order thinking as transfer gives students the ability to connect or relate their learning to other elements beyond those they were taught to associate with it into more complex ways in new or different settings (Brookhart, 2010).

To Brookhart's point, Newmann makes an important point that since individuals differ in the kinds of problems they find challenging, higher order thinking is relative a task requiring higher-order thinking by an individual may require lower order thinking by someone else. Accordingly, "to determine the extent to which an individual is involved in higher order

thinking, one would presumably need to know something about the person's intellectual history (p. 45). Lewis and Smith (2001) make note that not every discipline uses higher order thinking to add to its bank of knowledge. Philosophy and psychology are two disciplines that have made considerable contributions in specific ways of understanding higher order thinking. Because philosophy and psychology are two very difference disciplines, they have a diverse and distinct interpretations regarding such basic ideas as the nature of truth, how it is described, and how it is located. They are reflective of the two cultures identified by Charles Percy Snow (1964) in the humanities and the sciences. Philosophy is associated with the humanities, and psychology with the sciences. It is because of this diversity that both fields have been capable of making significant contributions to the field of higher order thinking. The contribution of philosophy to higher order thinking dates back to the time of Socrates, Plato, and Aristotle. Socrates believed that in order to stimulate critical thinking, people should engage in a form of debate or argumentative discussions focused on asking and answering questions. Ever since then, philosophers have believed that critical thought could be used as a moral compass to promote good.

Brookhart (2014) further states that higher order thinking can be defined as students having the ability to relate their learning to other fundamentals beyond those in which they were taught to associate with it. Students must have the ability to problem solve in an effort to obtain specific goals. Additionally, students who engage in higher order thinking have the ability to construct knowledge through the use of disciplined inquiry. They must be able to produce discourse, products, and display performances that have value beyond school. Lastly, students must have the ability to control their own ideas. In essence, in order for students to truly display critical thinking skills, they must be independent thinkers and problem solvers who question

what is taught and possess the capability to apply prior knowledge to real-life situations.

According to Thomas and Thorne (2009), higher order thinking is thinking that goes beyond rote memorization of facts and details and basic comprehension of a concept. Higher order thinking requires skills such as reflection, logic, critical thinking, problem solving, and creativity. In the 21st century, school curricula have placed much emphasis on teaching higher order thinking skills to students. In the United States, curriculum standards, such as the Common Core State Standards (CCSS), encourage teachers to push students to even higher levels of thinking. The ultimate goal is to teach students to think critically about what they learn, take the concepts they learn and transfer them to new situations, and figure out how to work through and solve problems. These are skills that students need not only to succeed in school but also to succeed in life. Although many frameworks for higher order thinking exist, a common one that educators use to teach students these thinking skills is Bloom's Taxonomy.

Similarly, Newmann, (1988) states that based on a review of philosophical, psychological and educational literature, researchers have defined higher order thinking as the interpretation, analysis, or manipulation of information to answer a question that cannot be resolved through the routine application of previously learned knowledge (p. 1). According to this definition, higher order thinking takes place whenever students respond to non-routine intellectual challenges. There is no guarantee that students will meet the challenges of higher order thinking successfully when offered. Therefore, teachers must be able to identify the types of resources their students need to resolve higher order problems proficiently by accessing a useful pedagogical conception of thinking. Teachers must also be able to implement strategies for their students that will help them develop those resources, such as, in-depth knowledge, intellectual skills, and dispositions of thoughtfulness (Newmann, 1990).

Additionally, Thomas and Thorne (2009) stated higher order thinking, or "HOT," will allow students to take their thinking to higher levels than just simply restating the facts. HOT requires that students actually do something with the facts that they have previously acquired. In order for students to demonstrate HOT, they must understand the facts, infer from them, connect them to other facts and concepts, categorize them, manipulate them, put them together in new or novel ways, and, ultimately, apply them as in an effort to develop new solutions to new problems.

Additionally, researchers and educators not only believe, but embrace the idea that higher order thinking skills are an essential component of a modern education and must be implemented in the classroom. Bol, Fischer, and Pribesh (2011) state, perhaps most importantly in today's information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world (p. 1). Many educators believe that specific knowledge, such as basic facts, is no longer important in our society today. Students who will be part of tomorrow's workforce must possess the ability to learn and make sense of new information in order to be successful.

A study conducted by (Newmann, 1991) examined social studies departments in 16 high schools in an effort to determine to what extent HOT was promoted and how obstacles were overcome in the more successful departments that were demonstrating HOT. This overview article presented a conception of HOT grounded in nonroutine intellectual challenges; a discussion of the role of knowledge, skills, and dispositions in meeting them; and the observation scheme used to assess classroom thoughtfulness. In developing markers of classroom thoughtfulness (CLT), the authors rated lessons on 15 possible dimensions of CLT. Some of the dimensions included were a critical examination of a few topics instead if an overview of many topics, the lesson displayed substantive coherence and continuity. Students were given an

appropriate time to think, and the teacher asked challenging questions while acting as models of thoughtfulness, and, lastly, students offered evidence supporting their conclusions.

Critical Thinking

The term critical thinking probably derived from the Indo-European root *ker* or *kere* (to grow) via the Latin *creation* or *creates* (to make grow) and, ultimately, means to "bring something new into being" (Glaveanu, 2013, p. 69; Weiner, 2000, p. 8). A researcher can unpack literature in the field of creativity and creative thinking and get a thousand different definitions. It may be because the idea of creative thinking does not have one right answer, but many different answers and the way of arriving at the conclusion of a problem. This is what makes the art of critical thinking so creative. Research has shown that originality is not the only source needed for a person to be creative, the activity must also be purposeful in order for students to engage. While many researchers, scientists, and educators offer their own definitions of critical thinking, many over-lapping characteristics are noted throughout their research. The following definitions and/or interpretations are just a few noted in this review of literature.

A statement by Michael Scriven and Richard Paul (1985), presented at the 8th Annual International Conference on Critical Thinking and Education Reform, Summer 1987, define critical thinking as the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action Scrivens and Paul (as cited by Xu 2011, p. 136). According to Scrivens and Paul (1985), in its basic form, critical thinking is based on universal intellectual values that go far beyond subject matter sections such as clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness. Scrivens and Paul further define critical

thinking as an approach to thinking about any subject, content, or problem in which the thinker improves the quality of thinking by skillfully taking charge of the structures fundamentals in thinking and imposing intellectual standards upon them.

According to Paul and Elder (2007), critical thinking is just one of the various forms of higher order thinking skills. Higher order thinking skills go beyond basic observation of facts and memorization, serving as an umbrella term for terms such as, *critical thinking*, problem solving, rational thought, and reasoning. These skills are what educators are referring to when they want their students to be evaluative, creative, and innovative. Critical thinking is more than just thinking clearly or rationally but about thinking independently. It means formulating one's own opinions and drawing conclusions regardless of the outside influences. Critical thinkers focus on the discipline of analysis and seeing the connections between ideas, and displaying an openness to other viewpoints and opinions. Starting with a question is the most straightforward approach to initiating the critical thinking process in the classroom.

One misconception of critical thinking, according to non-peer-reviewed literature, is that, a person's words or the words of others are intended for "criticism" or debate in an argument, when, in fact, all it means is that they are criteria based. These criteria require that students distinguish fact from fiction; synthesize and evaluate information; and clearly communicate, solve problems, and discover truths. According to William Gormley Jr. (2017), critical thinking is an open-minded effort to answer a question by combining both fact-based evidence with creative ideas. Although some critical thinking may result in a negative judgement of someone else's ideas, it also includes self-critique, which encourages analyzing and synthesizing information for a new judgment of ideas. Basically, critical thinking may sometimes require a thinker to abandon their ideas and beliefs and invite to embrace those of someone else's while

also demanding a close review of significant evidence. If that inquiry confirms someone else's preferred beliefs, then a true critical thinker will follow the data.

Higher order thinking as critical thinking means students can apply insightful judgment or produce a logical critique to reflect, provide reason, and make thorough decisions. Higher order thinking as problem solving is the manual strategizing needed for reaching a goal that cannot be achieved by utilizing basic rote memory to obtain a solution. According to Paul and Elder (2007), much of our own thinking, contains biases and is partial, uninformed, and will contain unavoidable prejudices. Ironically, the quality of our life and what we produce, make, or build relies precisely on the value of our thought. Critical thinking is, in essence, the basic foundation of a strong education.

How We Think (Dewey, 1910) examined what differentiates fundamental thinking, a human function we normally take for granted, from thinking well, and what it takes to master the art of thinking. Above all, Dewey clarified how we can productively channel our natural curiosity in the face of a flood of information. Dewey also looked at how people might learn to understand facts in order to make meaning. Dewey (1910) stated that more of our waking life than we should care to admit, even to ourselves, is likely to be whiled away in this inconsequential trifling with idle fancy and insubstantial hope (p. 2). Dewey thus suggested how "all people think" irrespective of their intellectual level. Apart from Dewey's fundamental thought that is simply all that reminds us of or goes through our heads, is known as the process called reflection.

> "*Reflection involves not simply a sequence of ideas, but a* con*sequence or a consecutive ordering in such a way that each determines the next as its proper outcome, while each in one another and support one another; they do not come and go in a medley. Each phase*

*is a step from something to something — technically speaking, it is a term of thought. Each term leaves a deposit which is utilized in the next term. The stream or flow becomes a train, chain, or thread." (*Dewey, circa *1910)*

Dewey described reflective thought as our most effective antidote to misconceptions. He said that effective, continuous, and deliberate analysis of any doctrine or supposed source of wisdom is a reflection of thinking in light of the reasons that justify it and its further conclusions. It is a conscious and willing effort to establish faith on a strong basis of reason.

Dewey argued that thinking is a natural and organic action, just like the body's lungs breathe in air and the heart beats. According to Dewey, teaching someone to think is impossible because thinking is an automatic action. Conversely, helping to develop someone's thinking is possible, by developing a mind that is creative, curious, and inquisitive. In an effort to foster this development, schools must teach information and foster interactions that challenge external reality. Instead of teaching facts through rote memory, schools can create encouraging environments that will fully support the already creative mind through stimulation into further creative thinking (Dekel, 2014). Dewey maintained, if we truly want to think, then we must understand not just how convictions are derive but how they influence our behavior, which they eventually do. Dewey (1910) stated that the best way of thinking is to take the foundation and consequences of beliefs into account.

This reasoning, Dewey argued (1910), constitutes a relational framework for the connection and validation of different pieces of knowledge. Good thinking means building fruitful ties. In all reflective or distinctly intellectual thinking the function by which one thing means or indicates another, and thus it leads us to consider how far one may be seen as a guarantee of faith in the others. Reflection therefore involves believing in or disbelieving in

something not on one's own account, but through something else that stands as a testimony, evidence, voucher, or warranty; that is as a basis for faith (1910). That which flows organically from this notion is that this thought is also about accepting fear and understanding the force of ignorance. Dewey explained that "thinking is defined as the operation where current facts suggest other facts (or truths) in a way that leads to belief in the latter on the ground or warrant of the former." They are not necessarily assured that inference is the best degree of assurance. Saying I think so means that I don't know this yet. The inferential presumption can later be validated and believed, but it always has a certain conclusion in itself.

Dewey (1910) often believed that certain subprocesses were involved in each reflective operation. These were: (a) a state of perplexity, confusion, doubt; and (b) an act of quest or inquiry to discover more evidence, which can be seen to validate or nullify the suggested belief. Reflection allows us to find ourselves, to analyze and seek knowledge when we are unsure. Dewey concluded that the spark of imagination is a sort of psychological restlessness rooted in confusion. Thought begins in what can very reasonably be called a situation on the forked path, an unclear condition that presents a problem and proposes alternatives. As long as our activity glides smoothly between one thing to another, or as long as we permit our imagination to enjoy fancies, there is no need to reflect. Nevertheless, threat or hindrance to a belief brings us to a pause. In the face of uncertainty, we climb the tree metaphorically; we try to find a place from which to analyze further facts and determine, having a better view of the situation, to determine how the facts are interrelated. Request for a solution to perplexity is the constant and driving factor throughout the reflection process. This need to solve perplexity also governs Dewey's form of investigation. The art of critical thinking at this stage is crucial. Like the scientist, whose exclusive role is to remain skeptical and explore insights, the thinking person must build a

capacity not only to accept but also to seek doubt. Dewey wrote: “If the proposition that occurs is adopted at once, we have an uncritical thinking superficial reflection” (1910). Taking it into account, reflecting means finding additional evidence, new data, that will either deliver the idea, as we say, or make clear its absurdity and significance. In short, reflective thought implies judgment that has been paused through further investigations, because anticipation is likely a little awkward. The essential elements of philosophy are to maintain the state of uncertainty and to conduct a rigorous and comprehensive inquiry (Dewey, 1910).

Dewey also believed this reflexive thinking acted as a solution for autopilot because it allows the only escape method from purely impulsive or repeated behavior. Dewey (1910) said thought can go both wrong and right, and therefore it requires security and training. Dewey cautioned us against the presumption that one’s intellect prevents the process from going wrong and, if anything, the relationship between imagination and deceit suggests that the most intelligent people are often those most skilled at rationalizing their erroneous beliefs and the resulting actions. Maybe the greatest gift of thought, Dewey pointed out (1910), is that it enables us to imagine things not yet achieved based on what we know in and about the current state, and gives us the capacity of “systematic foresight,” which allows us to behave on the grounds of the absent and the future. Dewey (1910) said that the method of reaching out to those absent from the present is particularly error-prone; that nearly any number of unknown and unaware variables can be influenced by the past experience, the assumed dogmas, the excitement of self-interest, passion, pure mental laziness, and a social environment full of skewed norms and false expectations. Attention essentially means the sense in which an idea occurs and the conditions under which it is attributed, knowing why we believe what we believe. Dewey argued that this is a function of critical thinking that is the result of something that we cannot be sure of is true.

Proving a thing specifically means trying and testing. Not until something has been tried or "tried out," do we know that it's true in everyday language. It might be pretense, a trick until then. Nevertheless, what was victorious in a court or test of power has its credentials; it is acknowledged because it has been verified (Dewey, 1910).

Most profoundly, Dewey explained how we store our "inventory of knowledge and truth" through one of the greatest gifts of humans the innate curiosity, "the ability for the fullness of our encounters." Children not only provide a blueprint for positive risk taking and overcoming fear of failure, but their relentless curiosity, he suggests, is precisely what we have to reawaken to foster fertile thought. From there comes the next stage of development; the what/why always exasperates parents and teachers, but provides the basis for critical thinking. Dewey (1910) wrote, under the influence of social stimulus, a higher level of interest arises. If the child learns that he can relate to others, so that if things do not respond to his experiences with interest, he can invite others to provide interesting material, a new age begins. "What is that?" and "Why?" become the unfailing signs of the life of a child. Again, Dewey reminded us that this rare human gift is focused on our sensitive desire to accept both uncertainty and unknown things which adults tend to give up over the years.

In the context of study, most pedagogic methods are one dimensional, which do not promote "critical thinking" and/or "reflective thought." The point of Dewey's article is that it is important for students to have the skills to understand the world and what it entails in teaching and learning. Teachers should engage students in philosophical inquiry and rational discussion in order to understand this. Critical debate is most effective when it takes the form of peer discussion. But as Freire (1995) pointed out, true dialog cannot occur until they engage in critical thinking.

A seminal study conducted by Glaser (1941) identified three characteristics of critical thinking. First, the student must have the predisposition to consider problems in a thoughtful way that may relate to one's own experiences. Students must also possess the knowledge and strategies of how to logically inquire and reason. Lastly, students must possess some skill in applying those methods. Critical thinking requires a consistent effort of examination of any belief or believed form of knowledge, while taking into consideration the evidence that supports it and the further conclusions to which it tends (Glaser, 1941). To employ the components of critical thinking, as identified by Glaser, students must develop the ability to recognize problems, collect all the necessary information and data that will allow them to address the problem logically, debate issues against beliefs, and make accurate decisions (Nappi, 2017).

Higher-order thought refers to logical, inference, and analysis processes and is typically used in tasks like problem solving, reasoning, learning, judging, and concluding (Bloom, 1956). Educators and researchers (e.g., Fahim & Masouleh, 2012; Gamble & Yang, 2013) have emphasized the value of the teaching of thinking. Higher order analysis is, in practice, an effective tool used to compete on the global labor market. In addition, the development of higher learning among students has become an essential part of education curricula and an advisable aim in higher education in many countries, including Taiwan. Providing students with high analytical ability to think critically and proactively has become the aim of current educational reforms in these countries, in order to reduce the use of traditional learning. In Taiwan, for example, a primary objective of English language learners is to practice all four language skills, including listening, talking, reading, and writing, using highly cognitive thinking skills, such as reasoning, evaluation, and problem solving to allow students to objectively communicate and speak while expressing their opinions. Higher order thinking has also become a part of reading

texts and composition, and several textbooks have embraced it in written or spoken exercises.

Socratic Style of Questioning

The Socratic style of questioning, according to Paul and Elder (2007), also encourages critical thinking. Socratic questioning "is a systematic method of disciplined questioning that can be used to explore complex ideas, to get to the truth of things, to open up issues and problems, to uncover assumptions, to analyze concepts, to distinguish what we know from what we don't know, and to follow out logical implications of thought" (p. 35).

Socratic questioning is most often implemented in the form of scheduled discussions about assigned material. Socratic questioning can also be used on a daily basis by incorporating the Socratic questioning process into daily interactions with students. Teachers need to understand the conceptual tools that critical thinking brings to Socratic questioning, and they need to foster student understanding of them. In teaching, Paul and Elder (2007) supply at least two fundamental purposes to Socratic questioning within the classroom. The first fundamental purpose would be for students to deeply explore their thinking. Through the deep exploration of thinking, students begin to differentiate between what they do and do not know or understand, which, in return, helps to develop intellectual humility in the process. Second, Socratic questioning foster students' abilities to ask probing questions by allowing them to gain the powerful tools of dialog. These two fundamental purposes are tools that students can use in everyday life while questioning themselves and others.

Additionally, Paul and Elder (2007) state that Socratic questioning teaches us the importance of questioning in learning. Throughout his writings, Socrates often noted that questioning was the only defensible form of teaching. Questioning teaches students the difference between organized and fragmented thinking. Questioning teaches students how to dig

deep beneath the surface of their ideas by making connections between prior and newly acquired knowledge in an effort to solve problems. Through this process, students learn the significance of developing a questioning mind through the cultivation of deep learning. Socratic questioning is closely connected with critical thinking because the art of questioning is important to quality of thought. The art of questioning alone is typically defined as the purposeful process of asking good questions. When the word "Socratic" is added to the art of questioning, it brings a depth and systematic process to assessing the truth or plausibility of things.

Critical thinking and Socratic questioning both share a common thread. Critical thinking provides the conceptual tools for understanding how the mind functions, and Socratic questioning makes use of those tools in framing questions essential to the pursuit of meaning and truth. Establishing an additional level of thinking to student's thinking is the ultimate goal of critical thinking. Through the art of critical thinking, students develop the ability to access their inner voice of reason, allowing them to monitor, assess, and reconstruct their thinking, feeling, and action in a more logical way. When teachers engage their students in Socratic discussion, they begin to foster their inner voice through a clear focus on self-directed, disciplined questioning (Paul & Elder 2017).

According to Lennon (2017), teacher directed classroom discussions and critical thinking exercises are a crucial concept in the social studies classroom (p. 14). The teacher should establish a dialogic sequence of inquiries by manipulating the prompts and questions and following a designed structure whereby students can learn irrespective of being active or passive participants in the discussion. In addition, the teacher should guide students to the right level of inquiry or at least help them to move through higher levels of thought by guiding the direction or flow of the discussion. Nevertheless, it is important to remember that a response to the issues

being discussed is not inherently the result that is needed or even desired, but rather the process of engaging critical thinking in an open, discussion-based setting. These skills and capabilities are crucial for higher cognition and understanding (Lennon, 2017).

The higher order questioning efficacy debate implies that questioning behavior itself has several learning disadvantages. One way to involve students in higher order thinking is to ask them questions of higher order. Excessive questioning behavior, for example, may cause a conversation to resemble an "inquisition" (Rowe, 1974), leading to nervous tension among students. Moreover, questioning cannot always be used to get student responses successfully (Wu, 1993). In addition, conventional questioning is conducted primarily in a way that teachers ask questions and students provide answers that cause passive learning behavior, whereby higher cognition is performed passively rather than proactively. Such behavior of teacher questioning also reduces the number of interaction opportunities for individual students. Researchers have argued that the effect of higher order questioning on speech and cognitive development is limited without addressing these concerns (Chen, 2016). Throughout this research study, the role of essential questions recurs. They inspire curiosity and contribute to a deeper understanding of the great ideas that allow students to better understand how the past interacts with the present.

Higher/Lower Level Questioning

In many secondary social science classrooms, the design and implementation of questioning, particularly with regard to a higher level of thinking, is common practice (Bickmore & Parker, 2012). Questioning can help teachers develop critical thinking concepts, scaffold discussions, and prod students toward and upward cognition levels (Bill, Newby, & Yang, 2005). Questioning can also help guide group discussion and help students gain a rational understanding of a topic or idea (Byun, Cerreto & Lee, 2014; Goddrey & Grayman, 2014). Many educators

may feel limited or unprepared for this practice in their conception and ability. In some respects, the confusion is merited, as questioning is a skill that is not easily mastered or understood (Lennon, 2017).

One cannot ignore the importance of the role of questioning in an effort to develop critical thinking skills in the classroom. Higher level questioning requires students to further analyze the concept(s) being examined using implementation, analysis, interpretation, and synthesis, whereas lower level questioning requires students to simply collect and recall information. Lower level questions are easier to produce for teachers, but do not encourage students to engage in higher level or critical thinking (Tienken, et al., 2010).

Tienken, Goldberg, and DiRocco (2009) focused on questioning procedures and noted a difference in the cognitive processes used when asked to remember or lower level questions, as compared with higher level questions that allowed students to interpret, synthesize, assess, categorize, and/or apply information, which were found to be of particular benefit to student learning. Generally speaking, higher level questions are not answered correctly, but encourage students to engage in critical thinking. Lunday (2008) found that it is essential for student learning to address higher level questions. Lewis (2015) found that asking higher level questions gives teachers more information about the understanding of students. The implications are that teachers need to strategically plan to encourage students to further investigate the concepts being studied in order to gain a deeper understanding. Historically, teachers ask two types of questions of their students— those who require skills of higher-level thinking and those who need cognitive skills of lower level thinking. Higher level cognitive questions are those that invite students to manipulate bits of previously learned information with logically reasoned evidence to create and support a response. The New Jersey Common Core Standards were created in 2009 to

promote higher level thinking by implementing open-ended, interpretive, evaluative, analytical, inquiry- based, inferential, and synthesis-based questions based on higher order thinking.

Lower cognitive issues are more fundamental and are often asked by teachers. These questions simply require students to remember the previously submitted word-for-word material or rote memory. In general, lower cognitive issues are factual, closed, direct, recall-related and knowledge-measuring questions. Much research has been undertaken to determine which questions in the classroom are most effective.

Newmann (1991) described higher order thinking as challenged and expanded use of mind and lower order thinking as routine, mechanical use, and restricted use of the mind in a more general and abstract way. He clarified that higher order thinking takes place when a student interprets, examines, and manipulates data, and, conversely, lower order thinking involves routine, mechanical application of knowledge previously learned and memorized. Newmann claimed that his definition of higher order thinking is not a specific conception but a broad concept, for example critical thinking and informal reasoning. Lewis and Smith (1993) agreed that the term higher order thinking can be used to refer to critical thinking, creative thought, problem solving and decision making.

The principles of creativity in education find their origins in John Dewey's dissertation (1916). He pointed out to us that all students must be involved in progressive reform efforts, focused not just on problem solving but "not on the repetition and unthinking acceptance of a disjointed body of facts" (Orlich & Tienken, 2013, p. 5). Dewey believed in a democratic scholastic system that encouraged the development and resolution of issues that would help society to move forward.

In a study by Sean Lennon 2017, "*Questions for Controversial and Critical Thinking Dialogues in the Social Studies Classroom*," he engages his 11th grade government students in an assignment to "solve" the Israeli/Palestine peace process in an effort to promote higher order thinking skills. Teams were set up and students were given an explanation of the topic and days to research and brainstorm the issue. In this case, the students were given an unsolvable problem. After a few days, in monologic format, the students would share their ideas with the teacher. During the classroom discussion, the teacher responded to the students with answers such as "been tried before," "wouldn't work because…," "would be genocide," etc. As one can imagine, students became extremely frustrated, and the teacher would take over with a directive in an effort to bring the class back to order. The students' frustration was openly discussed with the class, and the teacher stated that this type of discourse would be similar in passion to the "differing groups" they were just discussing. The strength in this methodology is how critical thinking skills are being promoted and fostered in a subtle fashion through higher level questioning techniques. This technique lends itself to more of an experiential style of learning as students are asked to critically think about a way to solve a problem by taking similar steps without even knowing it until the lesson is over.

Results from a study by Robert Steinberg suggested the importance of teaching creativity; however, amid the countless pleas to the teacher to teach creatively, very few do so. A study by Kiss, Jiaotong, and Wang in the *Journal of International Social Studies* (2017, pp. 55-69) argues that there may be some correlation between teaching experience and the types of questions being asked in the classroom. Both studies determined that even though there were higher level questions being asked by teachers, lower level questions still tend to dominate the classroom. During this study, both interviews and classroom observations were conducted to gather the

information necessary. The study conducted by Kiss, et.al. (2007) uses two samples, "John and Jane." John being the experienced teacher and Jane being the novice one. One weakness might be that there were only two participants for this study. While the results revealed that John asked more higher-level questions than Jane it was determined that years of experience may influence the questioning technique, although, this may not always be the case.

School Culture and Higher Order Thinking

School culture is one of the most complex and important concepts in education. School culture is considered the basic essence of an organization's existence. It sustains the organization's structure on a deeper level, thriving off basic assumptions and shared beliefs by members of the organization. These shared beliefs often operate unconsciously and in a basic "taken for granted" fashion of how the organization views itself and its environment. One could assume that a positive school culture dedicated to high standards which are embedded in the school philosophy would be successful on many levels. Frieberg and Stein (1999) describe school climate as the heart and soul of the schools and the essence of the school that draws teachers and students to love the school and want to be a part of it (p. 75). According to Hoy and Tarter (1997), there are significant characteristics found in both healthy and unhealthy schools. Healthy schools are generally found to promote high academic standards, provide appropriate leadership and encourage collegiality, creating a climate that promotes student success and achievement (Hoy et al., 1990). A past study by MacNeil, Prater, and Busch (2009) reveals that unhealthy schools typically lack effective leaders and, as a result, teachers are unhappy and academically unmotivated. For an organization to work successfully, it needs to understand explicitly why it exists and what it must do to maintain such principles. Things work poorly if concepts, values and beliefs are deficient and incongruous. Therefore, it can be concluded that

schools participating in structural change without addressing cultural change are more than likely to fail.

The MacNeil, Prater, and Busch (2009) school culture study measured school climate participants from 29 schools in the large suburban school district of Southeastern Texas with three assessments to improve the academic performance of the school. The Texas Education Agency gave one of the three ratings (exemplary, recognized, and acceptable) based on student performance on the Texas Academic Skills Assessment (TAAS). Test results were obtained from 24,684 participants. During this analysis, teachers were also asked to assess the organizational health of the school with the Organizational Health Inventory (OHI). To achieve this ranking, 1,727 teachers completed a questionnaire to achieve this ranking. Exemplary schools reported that acceptable schools were outperformed on student performance in accordance with the TAAS. Each school showing higher student accomplishments with an exemplary classification also showed a better school environment than the schools with an appropriate classification. It is fair that schools that show better student performance have generally demonstrated a safer school environment. A small sample size of 29 schools consisting of no low-performance schools could be a limitation in this report. The survey was also a combination of high schools, middle schools and elementary schools. A larger sample with one school level can show different data.

In addition to school culture, classroom environment also plays an integral part in the development of higher order thinking skills. Both the environment and culture in the classroom are key to the success of every discussion and to the overall success of the student. Before starting the questioning, Lennon stated that teachers should prepare the students with the rules of classroom and the necessary climate for the successful implementation of conversational subjects (2017). A successful culture in the classroom is one in which students are involved cognitively

and have a common belief in the importance of learning. The teacher has high expectations and focuses on hard work for all students. Students are responsible for the high quality of their work by making changes and helping their peers do the same when necessary (Danielson, 2011). In particular, in a student-centered, dialogic debate format, classroom culture is crucial to the development of critical and reflective thought concepts (Deal & Peterson, 1999; Harjunen, 2012; Marshall & Smart, 2013). The environment in the classroom must be conducive and secure for all students to openly share their ideas. No preferential treatment should be shown to any party. Teachers should be free of prejudice, or activities will fail before they start (Lennon, 2017).

Social Studies Standards (CCCS/NJSLS):

Founded in 1921, the National Social Studies Council (NSSC) is a country's largest association dedicated entirely to education in social studies. The NCSS assists and encourages teachers in the creation and promotion of social studies. The NCSS serves as an association of primary, secondary and university teachers in history, civics, geography, economics, political science, sociology, psychology, anthropology, and law education. Composed of members from all 50 states, Columbia, and 35 countries, the NCSS membership includes K-12 teachers, university, administrators, curriculum developers and experts, supervisors of social studies, and representatives in the various social studies disciplines.

Social studies is an integrated social science and humanities research to promote civic skills. Social studies within schools offers a coordinated and systematic research in areas including anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology and in the related fields of humanities, mathematics and natural science. The primary purpose of social studies is to help young people in an interdependent and cultural environment to improve their ability to make informed and

reasonable decisions for the public good as citizens. Social studies primarily encourages awareness and engagement in public affairs. And because municipal problems, such as health care, crimes, and foreign policies are multidisciplinary in nature, multidisciplinary learning is needed to recognize them and create resolutions. Such characteristics are the main determinants of social research (NCSS, 2010).

Fundamentally, social studies have been designed to create a humane society, to teach students how to be global citizens and to decide their position in society. Social studies is a term that covers broader disciplines, including anthropological, archaeological, economic, geographical, historical, law, philosophical, political, psychological, religious, and sociological studies, intended to teach group dynamics — the way people interrelate and learn to work together for productive society. During an informal conversation with a former secondary school teacher with 15 years of experience, the cause and effect of things is an essential skill in the teaching of social studies. For example, a debate without a clear answer is better than listing the 10 reasons for the occurrence of Pearl Harbor because it encourages critical thinking, not memorize facts and dates. Asking questions like, “Was the United States justified in dropping an atomic bomb on Japan?” or “How does Pearl Harbor apply to 911?” invites students to think critically in order to get the answer, even though the particular topic is not discussed in the classroom. Through social studies teaching, students develop critical thinking skills that enable them to use what they have previously learned in different situations in order to discuss possible outcomes and/or resolutions. Social studies teaching allows all students to acquire knowledge and expertise to focus analytically on the form of American identity through past and present interactions between people, cultures and the environment. This knowledge and these skills enable students to make informed choices reflecting basic rights and core democratic values as

productive citizens in local, national, and global communities.

Historically, social studies has always been about the study of our past, the economic conditions of our country, the political system that we are bound to and the surroundings that we live in. When students learn history, and study the successes and failures of the past, the hope is that they may be able to learn from past mistakes in an effort to avoid repeating the same mistakes in the future. This is the one of the fundamental goals of teaching social studies. Another goal of social studies teaching is to help students develop the ability to make informed and logical decisions for the greater good as responsible citizens of a culturally diverse, democratic society in an interdependent world. Additionally, students learn politics to understand the system of the world around them, to be able to make informed choices, to know the role they play in the system, and to gain a rich understanding of how the world works and why it works that way (personal communication, Lou Sera 5/17/19).

Through the teaching of social studies, students learn that in a world of income inequality and limited resources, economics is concerned with helping individuals and society to decide on the proper allocation of our limited resources. The goal of teaching geography is learning about different cultures and traditions to gain a better understanding of our society, while also understanding the principles and phenomena that affect our everyday lives. Thus, learning social studies makes a student an asset for our country and helps them in serving society better.

As previously stated, state standards in nine subject areas, known as the New Jersey Core Curriculum Content Standards (NJCCCS), have existed since the 1990s. The New Jersey State Education Board volunteered in 2010 to replace the previous English Language and Mathematics Standards with the Common Core State Standards (CCSS). The New Jersey Student Learning Standards (NJSLA) have recently been reviewed and renamed to provide educators with a

clearer roadmap to outline which skills students must learn at each grading level.

According to the New Jersey Department of Education (NJDOE), website at the threshold of the 21st century, New Jersey struggled, together with the rest of the nation, to educate its future internationally competitive citizens. The introduction of a state system of "Thorough and Efficient" public schools in New Jersey has faced a specific constitutional challenge. In 2010, the Common Core State Standards were voluntarily adopted in New Jersey, together with 42 other states and Washington, DC, by the National Governors Association and the Chief State School Officers Council. The Common Core replaced the previous New Jersey Core Curriculum Standards for Education in English Language Arts and Mathematics for all K-12 students. The remaining seven curricular areas of NJ CCCS remain unchanged (NJDOE, 2014).

New Jersey has a 120-year-old constitutional guarantee that its children will receive a "Thorough and Efficient" education regardless of their residency. Over time, the state developed into approximately 600 independent school districts that practiced significant "local controls," so it was a question of how to ensure the "T&E" education for all children. The fact that each district has established its own system has compounded this challenge. Core curriculum content standards were an attempt to define the meaning of "Thorough" in the context of the 1875 State constitutional guarantee that students would be educated within a Thorough and Efficient system of free public schools. These standards described what all students should know and be able to do upon completion of a 13-public education. The standards are specifically designed to prepare our students for college and careers by stressing the high-level skills required for the world of tomorrow (para. 2).

Released during the Reagan administration in 1983 by Terrel H. Bell, *A Nation at Risk: The Imperative for Educational Reform* created a public-school crisis that erupted into the first Bush administration and contributed to the President's call for clarity on "economic performance goals" (Bush, 1989). According to Tienken (2017), George H. W. Bush used his declaration as presidents before him to draw a line that linked economic security and national security principles through the use of precision doctrine. The President further defined seven areas to be covered by national performance goals. The President stated, by performance, we mean targets which, if achieved, will ensure that we are internationally competitive, such as readiness for children to start school; student performance in international tests of achievement, in particular, in mathematics and science; reducing dropout rates and improving academic performance, particularly among at-risk students; functional literacy of American adults; training level required to ensure competitive workforce; provision of qualified teachers and up-to-date technologies; and creation of safe, disciplined, and drug-free schools (p. 12). The seven areas identified by Bush at the Educational Summit eventually become a centerpiece of the President's State of the Union address on January 31, 1990. By then, the areas had morphed into six specific goals to be achieved by 2000.

By the year 2000, it was determined that every child must start school ready to learn. The United States must increase the high school graduation rate to no less than 90% ensuring that our schools' diplomas mean something. In critical subjects at the fourth, eighth, and 12th grades, we must assess our students' performance. By the year 2000, U.S. students must be first in the world in math and science achievement. (Bush, para.1)

According to Tienken (2017), those educators working in New Jersey prior to 1995 lived through the transformation from an input-guaranteed system to the output-guaranteed

environment that now exists (p. 15). Tienken (2017) further states, former Governor Christine Todd Whitman imposed the original set of New Jersey Core Curriculum Content Standards (NJCCCS) and state-mandated standardized tests as part of a public school funding lawsuit that her administration lost, known as *Abbott v. Burke*. The court instructed her administration to decide how much a "thorough and efficient" education would cost New Jersey to satisfy the resource feedback requirements outlined in the Comprehensive Educational Improvement and Finance Act (CEIFA). CEIFA was the emphasis of a government-funded system in New Jersey where school districts in the poorest communities in New Jersey complained that their children were not receiving the necessary input to provide an effective education to their children (p. 15).

Social studies standards have changed over time; for example, the NJCCSS were content standards that were based solely on teaching the content itself. These standards basically outlined what the students needed to know and by when. The State of New Jersey has since revised these standards multiple times throughout the past two decades and they went from being content-focused standards to being New Jersey Student Learning Standards and the skills students need to know. There is a great difference between content and skills. For example, knowing who our first president was would be a demonstration of lower level thinking requiring memorization of content. Comparing and contrasting two American presidents would be a demonstration of higher order thinking requiring a student to analyze, evaluate, and make judgement. Reading primary sources is a skill that is more focused on today and demonstrates a student's ability to extend students thinking and reasoning by synthesizing and analyzing single or multiple sources.

Cognitive Complexity

Cognitive complexity is a component of personal construct psychology introduced by James Bieri in 1955. Bieri (1954) notes, cognitive complexity refers to a person's ability to

interpret and react to variables based on previous experience and personal constructs. A basic understanding of personal constructs is required, in order to fully understand the concept of cognition as it applies to human psychology. The fundamental mental structures that individuals use to perceive and respond to the world are personal constructions, as understood by modern psychological experts. An individual develops a specific construction for each set of similar events with the capacity to adapt to future events within or reasonably close to the construct. How each of these constructs influence, relate, and overlap each other determines the cognitive complexity. An individual that can distinguish and respond to very subtle nuances in the same or similar construct between events scores high in this classification.

Metacognition

Metacognition "is the act of thinking about your own thinking" (Baviskar, Hartle, & Smith, 2012, p. 33). During teaching and learning, metacognition is frequently ignored in traditional classrooms, although it has many beneficial effects on education (Bissell & Lemons, 2006; Chen & Wang, 2014). An aspect of constructivism is effective thinking or cognition, which helps students to establish appropriate actions within a given environment and therefore to create awareness that can be used in future situational contexts. In addition, students are motivated in a constructivist environment to become conscious, self-mediated and self-regulating (Broyles, Porr, & Splan, 2011). The students can know their metacognitive abilities and should know what they know, what they do not know, their style of learning, and their shortcomings in relation to course materials (Jonassen, Luft, Marra, & Palmer, 2014; Abrami, Asian, Deault, Meyer, Wade, 2010; Chen & Wang, 2014).

Jonassen, Luft, Marra, & Palmer (2014) have reported that there are two metacognition components: reasoning knowledge and self-regulation. Awareness of cognition needs three

different forms of knowledge: (1) metacognitive knowledge, or skills needed for various tasks; (2) strategic knowledge, alternative learning methods and how these strategies should be used; and (3) self-knowledge or self-apprenticeship. The other aspect of self-regulation is the learner's ability to track his or her own comprehension and to regulate his/her own learning activities. One method of self-regulation is planning or preparation, which means that a participant begins with a range of approaches to a project and then sets specific objectives and methods to achieve the goals while recognizing possible obstacles. A second example is problem monitoring, requiring learners to be conscious of the learning task, and to foresee what should be done next, accompanied by an evaluation of the process (Dolmans, Grave, Vleuten, & Wolfhagen, 2005; Jonassen, Luft, Marra, & Palmer 2014; Abrami, Asian, Deault, Meyer, & Wade 2010; Derous, Loyens, & Wijnia 2011). The learner must also monitor his/her time, regulate his/her physical and social environment and monitoring his/her actions and effort (Abrami, Asian, Deault, Meyer, & Wade 2010). Likewise, metacognition has been described by Chen & Wang (2014) as a metacognitive understanding of what, how, why and when the learner asks questions about his/her learning process. Effective self-management must also be carried out, including cognitive task scheduling, evaluation and control (Greene, Mansell, & Walker 2006).

Bloom's Taxonomy

Bloom's Original Taxonomy (Figure 1, p. 6) Benjamin S. Bloom (1956) developed one of the original cognitive demand taxonomies to characterize the student learning process as a fundamental goal. Bloom's framework follows a hierarchical system where learning is built on prior acquired knowledge. Bloom's Taxonomy of Educational Objectives included knowledge, comprehension, application, analysis, synthesis, and evaluation. A detailed description of the classification of cognitive domains is as follows (as adapted by Bloom's Taxonomy):

Knowledge is defined as the remembering of previously learned material. Knowledge represents the lowest level of learning outcomes in the cognitive domain. It is usually associated with rote memorization and recalling of specific facts.

Comprehension refers to the ability to grasp the meaning of material. These learning outcomes go one step beyond the simple remembering of material and represent the lowest level of understanding. This level of learning involves explaining, summarizing, defending, or predicting.

Application refers to the ability to use learned material in new and concrete situations. Learning outcomes in this area require a higher level of understanding than those under comprehension. This level of cognitive learning involves application, demonstration, manipulation, and relating.

Analysis means the ability to break down material into its component parts so that its organizational structure may be understood. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material. This level of cognitive learning involves differentiating, relating, and distinguishing.

Synthesis refers to the ability to put parts together to form a new whole. Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns of structures. This level of cognitive learning involves creating, composing, designing, and revising.

Evaluation level is where students make judgments about the value of ideas, items, materials, and more. Evaluation is the final level of the Bloom's Taxonomy pyramid. It is at this level, where students are expected to bring in all they have learned to make informed and sound

evaluations of material.

Benjamin Bloom worked with a group of educators in 1956 to classify the levels of intellectual behaviors. The original framework (above) involves the levels of cognitive taxonomy starting with knowledge (*simplest tasks*) and moving up the levels through comprehension, application, analysis, synthesis, and finally to the top level of evaluation (*most complex tasks*).

Bloom's Taxonomy (Revised)

In 2001, the original taxonomy was revised to the current framework by Lorin Anderson and David Krathwohl (Figure 2). The words shifted from nouns to verbs, for example, knowledge to remember and comprehension to understand. The underlying meaning of the idea, however, did not change. One of the most important changes is switching the Evaluation/Evaluate order to come after Synthesis/Create (Armstrong, 2017). As always, these six categories begin with the simplest (remember), and the most complex (create).

You will gain a better picture of the level of cognitive rigor involved in learning as you move through the categories. Below is the breakdown of each category:

1. **Remember** involves being able to recall, define, or label.
2. **Understand** is to summarize or classify.
3. **Apply** requires some level of implementation or following a procedure.
4. **Analyze** is to break down parts of a concept for deeper analysis.
5. **Evaluate** is critiquing or making a judgement based on research.
6. **Create is** to develop something new based on all the learning.

Each level of Bloom's Taxonomy builds upon each other so that the student has to master the lower levels before moving to the next level. Bloom's Taxonomy is a method for teaching and assessing the intellectual rigor of a lesson (as shown in Figure 2).

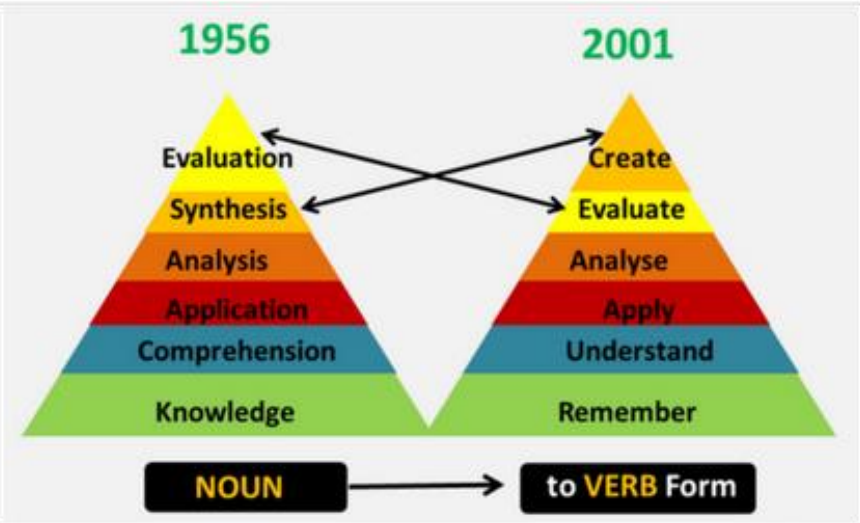


Figure 2. A comparison of descriptors: Bloom's Original Taxonomy (1956) and the Revised Bloom's Taxonomy (2001) cognitive process dimensions (Anderson and Krathwohl, 2001).

Critical thinking is more important than ever due to the plethora of invalid information to which students have access and is also desired by graduate and professional schools as well as employers (Gomboc-Turyan, 2012). Students often have difficulty thinking critically and the root of critical thinking is determining the validity and nonvalidity of information (Weiler, 2005). Authors have suggested that if students are challenged daily during class, they will be prepared for upper-level questions in Bloom's taxonomy during exams (Baviskar & Lord, 2007).

Webb's Depth of Knowledge

The depth of knowledge or the level of knowledge (Figure 3) is another type of framework used to describe the level of rigor of an evaluation. In 1997, Dr. Norman Webb created the DOK to identify behaviors according to the degree of learning complexity. The development of the DOK was focused on the harmonization of standards to evaluations. Standardized tests measure how students are thinking about the content and techniques they have learned, but not how deeply they have to understand and be able to learn so that they can explain

answers and solutions and translate what they have learned into real-world situations (Francis, 2017). In principle, DOK seeks to create the context— the event, the environment, or the situation— in which students express the depth and scope of their learning (Francis, 2017). This system consists of four levels, the simplest level at level 1 and the most complex level at level 4 (as displayed in Figure 3.)

Level 1 (Acquired knowledge) involves recall and reproduction. Remembering facts or defining a procedure.

Level 2 (Knowledge Application) are skills and concepts. Students use learned concepts to answer questions.

Level 3 (Analysis) involves strategic thinking. Complexity increases here and involves planning, justification, and complex reasoning. Explains how concepts and procedures can be used to provide results.

Level 4 (Augmentation) is extended thinking. This requires going beyond the standard learning and how else can the learning be used in real-world contexts.

Figure 3. Webb's Depth of Knowledge (Webb, 2005).

Research notes that what is measured is the major difference between these two conceptual frameworks. Bloom's Taxonomy measures the students ' cognitive level to show that a learning experience has occurred, while the DOK is more focused on the context, the scenario, or the situation in which students will express their learning. Research has shown that Bloom's Taxonomy is best used to measure training, objective, or cognitive rigor, whereas the DOK is better to measure the actual assessment itself. Simply put, Bloom's provides a framework for feedback, as the DOK analyzes the specifics of the tasks. Bloom's Taxonomy also allows students to master lower cognitive grades before moving on to the next level. Therefore, when

using a mathematical formula, they must first be able to identify this formula and its basic function (remember and understand). This may mean that the goals are set in incremental steps to demonstrate the advancement of learning. In DOK, students move fluently across all levels while evaluating the assessments. In the same example, students remember knowledge or formula (DOK 1) to solve a problem by using a mathematical Formula (DOK 2 & DOK 3). Depending on the complexity of the question, learning could become DOK 4.

Identifying the DOK level of questions in textbooks, test/quizzes, or classrooms can help to clarify how students need to grasp the relevant material in order to perform the tasks required. In comparison to the Bloom Taxonomy, the Webb Model states that the level of depth of knowledge does not automatically equate with the widely accepted theory of "difficulty." In other words, behavior aligned with a particular level is not always "easier" than activity aligned with the DOK level above it. For example, a DOK 1 task can require that students reaffirm a simpler fact or a much more complicated concept, that is much harder to remember and reaffirm. None of these DOK 1 activities require a great deal of breadth of material comprehension. More depth, on the other hand, is needed to explain how a principle or principle functions (DOK 2), to apply it to real-world phenomena with justification or proof (DOK 3), or to include a concept with other theories or perspectives (DOK 4) (Hess et al., 2009a).

According to Hess et al. (2009a), teachers in the professional education community have slowly begun to incorporate profound knowledge into their course planning as a step in formulating questioning strategies and optimizing assessments as identified in the DOK level of questions. The teachers started to understand how the context of the knowledge fits into its lesson planning after some introduction of DOK techniques in the classroom and discussion among colleagues. As educators have found, the DOK level of questions in assessments and

lessons help explain how students need to understand the appropriate content for the required tasks. Students need a more in-depth understanding of how and why the concept or rule functions (DOK-2), to apply it to real-world phenomena with evidence (DOK-3) or to combine a given concept with other concepts or perspectives (DOk-4) (p. 5).

Hess Cognitive Rigor Matrix

The Hess Cognitive Rigor Matrix (Figure 4) will be used as the framework in this study by measuring the frequency and percentage of questions at each level of thinking as well as the frequency and percentage of higher order thinking embedded in the questions found on tests and quizzes in a 10th grade social studies textbook. Karin Hess and colleagues have blended two existing models of cognitive rigor and deeper learning that have been widely adopted in the United States in the fields of education and assessment. While related to the nature of thoughts by their natural similarities, Bloom's levels of thinking and Webb's DOK vary in scope, implementation, and purpose (Carlock, Hess, Jones, & Walkup, 2009). The result of this early analysis was the Hess Cognitive Rigor Matrix (CRM), a template that superimposed Bloom's Taxonomy with Webb's Depth of Knowledge. The Hess CRM aids educators in implementing intellectual rigor in the classroom and guides curriculum designers in the development of test items and assignments. The Hess CRMs are used to categorize and plan content-specific descriptors for different levels of abstraction, meaning an analysis of the mental processing needed for evaluating questions and learning tasks (as displayed in Figure 4.)

Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions - *ELA*

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/ Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	○ Recall, recognize, or locate basic facts, details, events, or ideas explicit in texts ○ Read words orally in connected text with fluency & accuracy			
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion), predict, compare/contrast, match like ideas, explain, construct models	○ Identify or describe literary elements (characters, setting, sequence, etc.) ○ Select appropriate words when intended meaning/definition is clearly evident ○ Describe/explain who, what, where, when, or how ○ Define/describe facts, details, terms, principles ○ Write simple sentences	○ Specify, explain, show relationships; explain why, cause-effect ○ Give non-examples/examples ○ Summarize results, concepts, ideas ○ Make basic inferences or logical predictions from data or texts ○ Identify main ideas or accurate generalizations of texts ○ Locate information to support explicit-implicit central ideas	○ Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference) ○ Identify/ make inferences about explicit or implicit themes ○ Describe how word choice, point of view, or bias may affect the readers' interpretation of a text ○ Write multi-paragraph composition for specific purpose, focus, voice, tone, & audience	○ Explain how concepts or ideas specifically relate to *other* content domains or concepts ○ Develop generalizations of the results obtained or strategies used and apply them to new problem situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	○ Use language structure (pre/suffix) or word relationships (synonym/antonym) to determine meaning of words ○ Apply rules or resources to edit spelling, grammar, punctuation, conventions, word use ○ Apply basic formats for documenting sources	○ Use context to identify the meaning of words/phrases ○ Obtain and interpret information using text features ○ Develop a text that may be limited to one paragraph ○ Apply simple organizational structures (paragraph, sentence types) in writing	○ Apply a concept in a new context ○ Revise final draft for meaning or progression of ideas ○ Apply internal consistency of text organization and structure to composing a full composition ○ Apply word choice, point of view, style to impact readers' /viewers' interpretation of a text	○ Illustrate how multiple themes (historical, geographic, social) may be interrelated ○ Select or devise an approach among many alternatives to research a novel problem
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)	○ Identify whether specific information is contained in graphic representations (e.g., map, chart, table, graph, T-chart, diagram) or text features (e.g., headings, subheadings, captions) ○ Decide which text structure is appropriate to audience and purpose	○ Categorize/compare literary elements, terms, facts/details, events ○ Identify use of literary devices ○ Analyze format, organization, & internal text structure (signal words, transitions, semantic cues) of different texts ○ Distinguish: relevant-irrelevant information; fact/opinion ○ Identify characteristic text features; distinguish between texts, genres	○ Analyze information within data sets or texts ○ Analyze interrelationships among concepts, issues, problems ○ Analyze or interpret author's craft (literary devices, viewpoint, or potential bias) to create or critique a text ○ Use reasoning, planning, and evidence to support inferences	○ Analyze multiple sources of evidence, or multiple works by the same author, or across genres, time periods, themes ○ Analyze complex/abstract themes, perspectives, concepts ○ Gather, analyze, and organize multiple information sources ○ Analyze discourse styles
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			○ Cite evidence and develop a logical argument for conjectures ○ Describe, compare, and contrast solution methods ○ Verify reasonableness of results ○ Justify or critique conclusions drawn	○ Evaluate relevancy, accuracy, & completeness of information from multiple sources ○ Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, produce	Brainstorm ideas, concepts, problems, or perspectives related to a topic or concept	○ Generate conjectures or hypotheses based on observations or prior knowledge and experience	○ Synthesize information within one source or text ○ Develop a complex model for a given situation ○ Develop an alternative solution	○ Synthesize information across multiple sources or texts ○ Articulate a new voice, alternate theme, new knowledge or perspective

Figure 4. Hess Cognitive Rigor Matrix (Hess, 2009).

Hess et al. (2009b) defended that there are three benefits to educators using the Cognitive Rigor Matrix. First, it helps recognize the similarities and distinctions between both Bloom's Taxonomy and Webb's Depth of Knowledge. Furthermore, it "allows educators to examine the depth of understanding required for different tasks that might seems at first glance to be comparable level of complexity: enabling teachers to better understand the level of cognitive complexity of a particular task or action" (p. 3). Teachers can use this information when developing questions for assessments, such as tests and quizzes and/or during the development of curriculum. These strategies would help meeting the needs of diverse learners by providing

differentiation in not only the assessments themselves, but the cognitive rigor that students must utilize in order to successfully complete the assignment. Lastly, Hess et al. (2009a) claimed that the Cognitive Rigor Matrix "allows educators to uniquely categorize and examine selected assignments/learning activities that appear prominently in curriculum and instruction" (p. 3).

Generally speaking, the Hess Cognitive Rigor Matrix allows educators to more accurately analyze and differentiate tasks, thus enabling them to create more effective lesson plans. By challenging students to use information in new and complex ways, educators can foster deeper levels of learning and understanding by promoting higher order thinking.

Teachers are not only able to use this template to assess students who are required to use higher order thought skills in accordance with Bloom's taxonomy, but also to adjust these assessments so that they can develop cognitive rigor, in line with Webb's Depth of Knowledge, to meet the needs of individual students. The Hess Cognitive Rigor Matrix is critical for enhancing classroom learning and evaluation practices. Hess et al. (2009b) explained that the Cognitive Rigor Matrix "has significant potential to enhance instructional and assessment practices at the classroom level" because cognitive rigor is multifaceted, including complexity of content, student cognitive engagement, and the scope of activities (p. 7). In general, the Hess Cognitive Rigor Matrix allows teachers to evaluate and identify tasks more efficiently in an effort to create more successful lesson plans. By challenging students to use understanding in new and complex ways, teachers can encourage deeper learning and comprehension by facilitating higher thinking.

In 2009, this model was tested in two large-scale studies examining mathematics and English Language Arts curriculum among 200 public schools in Nevada and Oklahoma. Two hundred thousand samples of student work were submitted in mathematics and ELA including

assessments, classwork, and homework. According to the results, there appeared to be an over reliance on teaching straightforward applications of routine steps. Results for English Language Arts indicated the majority of assignments consistent with the (B,2) cell of cognitive rigor. (The two coordinates represent the levels of DOK and Bloom's Taxonomy.) The mathematics assignments yielded different results. According to the data sampled, the (A,1) and (A,3) cells were more predominant. Although assignments associated with the mathematical results involved skills such as algebraic equations and non-rote arithmetic, which helped students practice critical numeracy and fluency skills in mathematics, the results still reflect a focus on applications of routine steps.

Students learn and acquire information more quickly when their learning is applied to new or complicated circumstances, a process that is more likely to take place when they have gained a deep understanding of the material (National Research Council, 2001). Accordingly, relying solely on a curriculum focused on state requirements does not prepare students for the demands of the 21st century. Therefore, teachers must offer all students demanding and challenging assignments and goals, structure learning in order for students to achieve high objectives and to improve both surface and profound content learning (Hattie, 2002). The use of Bloom's taxonomy and Webb's Depth of Knowledge, thus constitutes a significant factor in the academic improvement of the state requirements and assessment alignment.

Theoretical Framework

Although various models for encouraging and developing higher order thinking skills exist in schools throughout the United States, none have as much popularity as Bloom's Taxonomy and Webb's Depth of Knowledge. These two frameworks, although similar in many of the terms and descriptions used at each level, differ greatly in the area of focus regarding

higher order thinking. Bloom's Taxonomy, referring specifically to the knowledge-based taxonomy, concentrates on actions students perform in order to demonstrate an understanding of a particular concept. Webb's Depth of Knowledge, on the other hand, focuses on a task's level of cognitive complexity, which encompasses the number of connections a student makes, the level of reasoning, and reflective and self-monitoring processes utilized in order to effectively complete a task (Hableton & Jirka, 2005, p. 7).

The Hess Cognitive Rigor Matrix layers these two frameworks in a model that combines the actions of Bloom's Taxonomy with the cognitive complexity of Webb's Depth of Knowledge. This blend of the two frameworks provides a means for educators to be more cognizant of the ways in which classroom instruction can cultivate higher order thinking development while also increasing cognitive complexity, furthering the levels of differentiated instruction that can occur in the classroom. Additionally, the Hess Cognitive Rigor Matrix serves as a model that can help educators understand the complexity of the tasks and questions they assign to their students, allowing them to choose tasks that are developmentally appropriate in fostering higher order thinking skills in each student. Overall, Hess Cognitive Rigor Matrix blends the actions with the cognitive complexity of tasks and activities being asked of students in order to create a holistic model that can encourage higher order thinking (Hess et al., 2009). One of the major challenges appears to be the inability to determine a cohesive definition of higher order thinking. While it seems that basic knowledge is at the root of higher order thinking and cannot take place without it, there are still many variations of the definition to be considered. Further research will have to be conducted.

The theoretical framework of this study uses the Hess Cognitive Rigor Matrix to compare the language found on test and quizzes of a 10th grade social studies textbook in one high school

with the language that promotes higher order thinking found in research literature. The frequency and percentage of questions at each level of thinking will also be categorized by the Hess Cognitive Rigor Matrix. The Hess Cognitive Rigor Matrix provides an examination of the "depth of understanding required for different questions that might seem at first glance to be comparable levels of complexity," allowing for a more in-depth analysis of the types of questions presented on tests and quizzes (Hess et al., 2009b, p. 3). Similarly, it helps to "uniquely categorize and examine selected questions that appear prominently in curriculum and instruction" (p. 3). Using the Cognitive Rigor Matrix can provide a more comprehensive analysis of the types, frequencies, and categories of questions presented to students on tests and quizzes to determine if they are promoting higher order thinking.

Because the Hess Cognitive Rigor Matrix utilizes both Bloom's Taxonomy and Webb's Depth of Knowledge, it provides a complex look at the types of questions being promoted in an educational setting. Bloom's knowledge-based taxonomy helps educators to realize the variety of questions that can promote higher order thinking that should be offered to students. Based on the review of literature, there appears to be some common language associated with higher order thinking. Most literature states that students who engage in higher order thinking go beyond the basic level of comprehension. Students who engage in higher order thinking will analyze, synthesize, assess, and interpret the text we read at complex scales. They can interpret text in depth, make judgments, and distinguish meaning shades. They will make critical observations and show high levels of understanding and maturity. They can assume, draw valid and insightful conclusions, use their experience in new situations, and link their reasoning with other situations and their knowledge of the context.

Until Hess (2006b) blended both Bloom's Taxonomy and Webb's Depth of Knowledge, no simple one-to-one matrix existed (Figure 5). This blending resulted in the cognitive rigor (CR) matrix that (Figure 4) vividly connects, yet clearly distinguishes the two representations, allowing educators to examine the rigor associated with tasks that may seem at first glance comparable in complexity. The cognitive rigor matrix soon found use in states just beginning to appreciate the role that cognitive complexity played in test design and item development (Hess, 2006a; 2006b).

According to Erik Francis, cognitive rigor provides an enhanced educational experience by the superimposure of the two educational frameworks that indicate how profoundly students demonstrate their expertise — revised Bloom's Taxonomy and Webb's Depth of Knowledge (Hess et al., 2009a; 2009b). Bloom's Taxonomy categorizes students ' type of awareness and thought to answer a question. Webb's Depth of Knowledge shows the depth of knowledge that students express to answer a question in a given context. With these two frameworks in place, cognitive rigor serves as a high-quality teaching tool to ensure teachers are able to prepare their students for class success.

Another important aspect of intellectual rigor is the promotion of educational participation by challenging students to explain, in their own unique way, what they have learned. Students must learn how to become critical thinkers who pursue meaning and can acquire vast amounts of information and then use the deeper knowledge learned in a variety of educational and real-world contexts. Educators are tasked with providing learning experiences that encourage a thorough study of knowledge. Therefore, using cognitive rigor as a measurement device helps students to use cognitive rigor as a systematic learning target (Francis 2016).

"*Over the years, quite a few researchers have challenged Bloom's concept of a taxonomy for higher order thinking. I actually developed my CRM to "prove" that what we have always called "higher order" does not necessarily get at deeper understanding. Bottom line, in my mind, is not to narrowly define what thinking looks like, because some definitions are limited. My CRM for social studies is good analyzing tasks given to students. My tool 26 (also attached), from my book is part of my walk-through tool for looking at teacher-student roles. I suggest this be the focus (teacher-student roles) - when do the students get tasks and questions that put them in charge of directing their own learning instead of just answering the teacher's questions?" (K. Hess, personal communication, July 1, 2019)*

Organization of the Dissertation

Chapter III will include an in-depth analysis of the methodology for this study, including an introduction to the study, research questions governing the study, and a description of the design and purpose of the study. Furthermore, Chapter III contains a description of the coding scheme utilized, a description of the qualifications for trained consultant coders, the method for ensuring credibility used, training in coding offered prior to the study, and a description of the method for analyzing the selected questions based on the Hess Cognitive Rigor Matrix.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this case study with mixed methods was to determine how the language of written question prompts and activities in a 10th grade social studies textbook series associates with the language of higher order thinking found in the research literature. A mixed-method approach with qualitative and quantitative content analysis methods was the research design utilized. "The core assumption of this form of inquiry is that the integration of qualitative and quantitative data yields additional insight beyond the information provided by either qualitative or quantitative data alone" (Creswell & Creswell, 1018, p. 4). Specifically, the language from question prompts for tests and quizzes given in a 10th grade U.S. History 1 class within a high school that serves students from middle to low-socioeconomic households analyzed and compared with the language associated with higher order thinking found in the research literature.

Research Questions

The study was guided by the following overarching question: What are the types of thinking being promoted in a 10th grade social studies textbook?

The following two questions guided the specific inquiry of the study, as follows:

1. In what way(s) does the language found on tests and quizzes of a 10th grade social studies textbook associate with language that promotes higher order thinking found in the research literature?

2. What is the frequency and percentage of higher order thinking, as described by the Hess Cognitive Rigor Matrix, embedded in Social Studies questions presented on 10th grade tests and quizzes from one textbook series?

Research Design

This research study utilized a case study design with mixed methods. A case study is an in-depth description and analysis of a bounded system (Merriam, 2009). Yin (2008) stated that a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p. 18). Wolcott (1992) saw it as "an end-product of field-oriented research" (p. 36) rather than a strategy or method.

Researchers may study a single case or multiple cases. For this reason, case study research often involves the use of multiple methods for collecting data. By using multiple sources of data, both qualitative and quantitative, researchers may attain the richest possible understanding of a case. Mixed methods research is an approach to inquiry involving both qualitative and quantitative data, integrating the two forms of data, and using the distinct designs that may involve assumptions and theoretical frameworks. The main assumption of this form of inquiry is that the integration of qualitative and quantitative data yields additional information beyond the information provided by either qualitative or quantitative data alone (Creswell & Creswell, 2018). The case study approach allows in-depth, multi-faceted explorations of complex issues in their real-life settings. The value of the case study approach is well recognized in the fields of business, law and policy.

Research Bias

Having spent 29 years in the field of education as both a former 5th grade teacher and a current elementary school principal, the researcher confirms confirmation bias may exist. Confirmation bias is the tendency to search for, interpret, favor, and recall information in a way that affirms one's prior beliefs or hypotheses. It is a type of cognitive bias and a systematic error of inductive reasoning. After completing 100+ classroom observations a year for approximately eight years, one could assume that the researcher may have some bias to the types of questions that are being asked within textbooks, tests, and classrooms. It may be safe to assume that confirmation bias could exist and that the researcher may not perceive circumstances objectively. To minimize confirmation bias, it is important for the researcher to remain open-minded and keep an eye out for evidence that supports alternative ideas and theories. Additionally, researchers must also be open to embrace surprises found during their research, and researchers must move toward the idea that complete confirmation bias is never 100% achievable. When you feel that something did not go exactly as you expected, consider that you need to refine some hypotheses about how things are working.

Data Collection

The data consisted of publicly available question prompts from assessments such as tests and quizzes in a 10th grade social studies textbook. In total, the assessments contained 287 questions for a 10th grade social studies U.S. History 1 textbook. The vendor of the textbook created the questions which are aligned to the NJSLS. Five types of examination questions displayed on the test requiring a student response, such as matching, multiple choice, short answer, essay and a document-based question (DBQ). A DBQ is an essay or series of short-answer questions that are constructed by students using one's own knowledge combined with

support from several provided sources, such as maps, excerpts, tables, and charts. DBQ questions are similar to essay questions as in they require students to respond by formulating multiple paragraphs consisting of an opening paragraph, two or three body paragraphs to persuasively support the point of view, and a closing paragraph. For this study, the researcher focused on all five types of questioning and the language found within the questions to determine the level of cognitive complexity and depth of knowledge needed to successfully answer the questions. The sampling of all 287 questions in this study provided a sample size of 100% of the total number of questions.

Methods

The use of a qualitative content analysis method by the researcher to compare the type of language used in written question prompts on assessments such as tests and quizzes in a 10th grade social studies program in one school district to the language of higher order thinking found in research literature via the use of the Hess Cognitive Rigor Matrix. A qualitative content analysis is "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278). Berelson (1952) regarded content analysis as "a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (p. 18, as cited in Bengtsson, 2016, p. 9). The definition was expanded upon by Krippendorff (2004) to include that content analysis must make "replicable and valid inferences" from the text itself and its use (p. 18, as cited in Bengtsson, 2016, p. 9). Because qualitative content analysis serves to identify the link between the context of a text and the nature by which the text was produced, this method was the best fit for the study (Downe-Wambolt, 1992, as cited in

Bengtsson, 2016, p. 9) to examine the language of classroom question prompts and the association to the language of higher order thinking found in the extant literature.

The use of descriptive statistics by the researcher to quantitatively describe the frequency of the language found on tests and quizzes of a 10th grade social studies textbook series used in one high school with the language that promotes higher order thinking found in literature research. Both the frequency and percentage of questions at each level of thinking as categorized by the Hess Cognitive Rigor Matrix, were calculated. Additionally, the frequency and percentage of higher order thinking as described by the Hess Cognitive Rigor Matrix, embedded in social studies questions required of 10th grade students during assessments such as tests and quizzes were calculated.

The use of a deductive category application by the researcher linked the Hess Cognitive Rigor Matrix to the questions found on tests and quizzes (as shown in Figure 5). Deductive category application is the process in which text is analyzed based on pre-existing categories following a coding protocol developed by (Mayring, 2000). The pre-existing categories for this study were the categorization of thinking as represented in the Hess Cognitive Rigor Matrix. The figure below highlights the step model of deductive category application, adapted from Mayring (2000), for the current study to describe the coding and analysis process. First, the author created a coding agenda based on the web alignment tool and a coding protocol and definitions for the Hess Cognitive Rigor Matrix model. Next, the author participated in consultant coder training on the Hess Cognitive Rigor Matrix coding agenda, rules, protocol and practice coding and calibration. The coding team conducted qualitative content analysis of assessments using deductive category application based on the Hess Cognitive Rigor Matrix. Next, the coding team

conducted a final coding and consensus meeting. Finally, data analysis and interpretation took place.

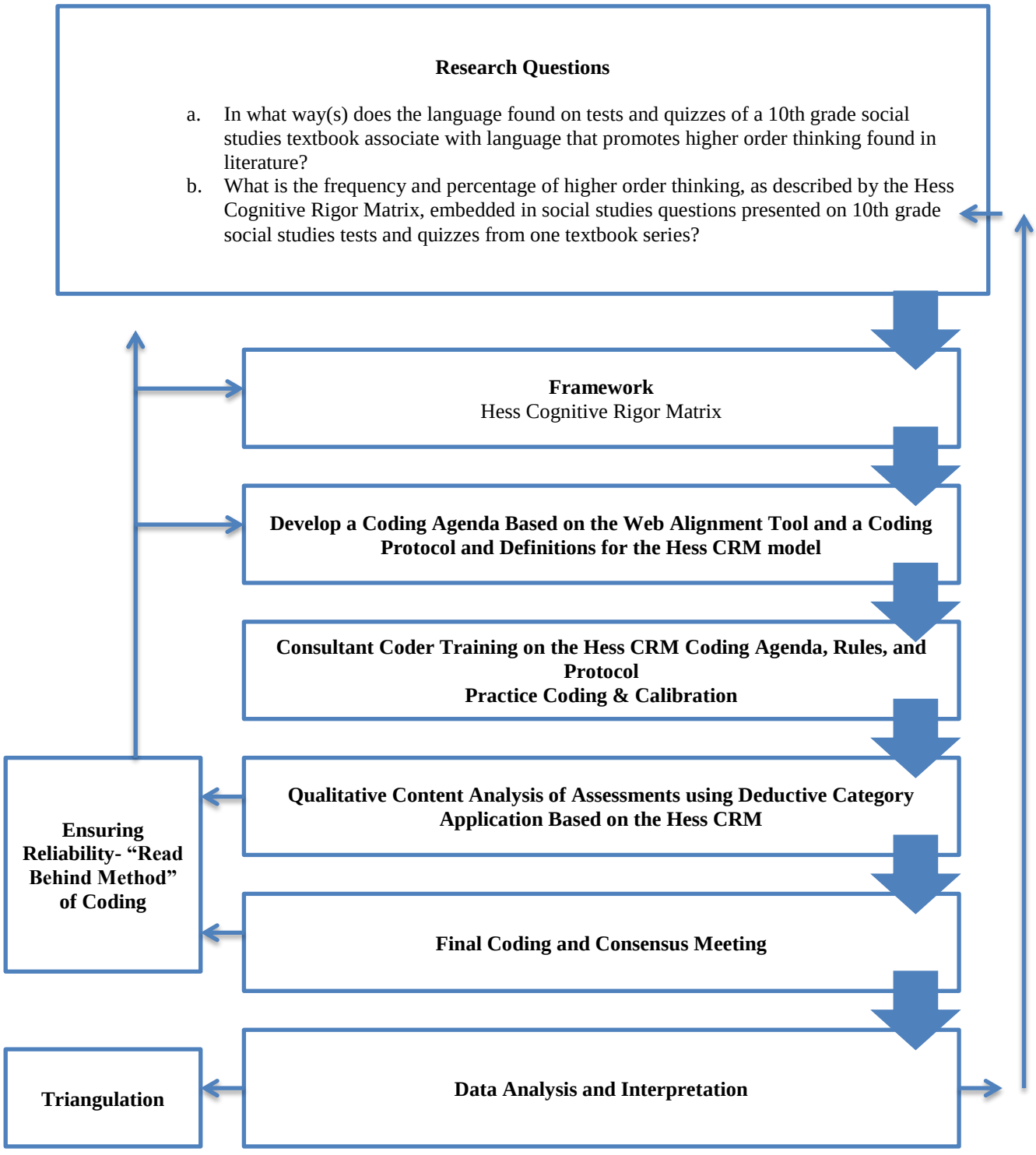


Figure 5. Step model for deductive category application, adapted from Mayring (2000).

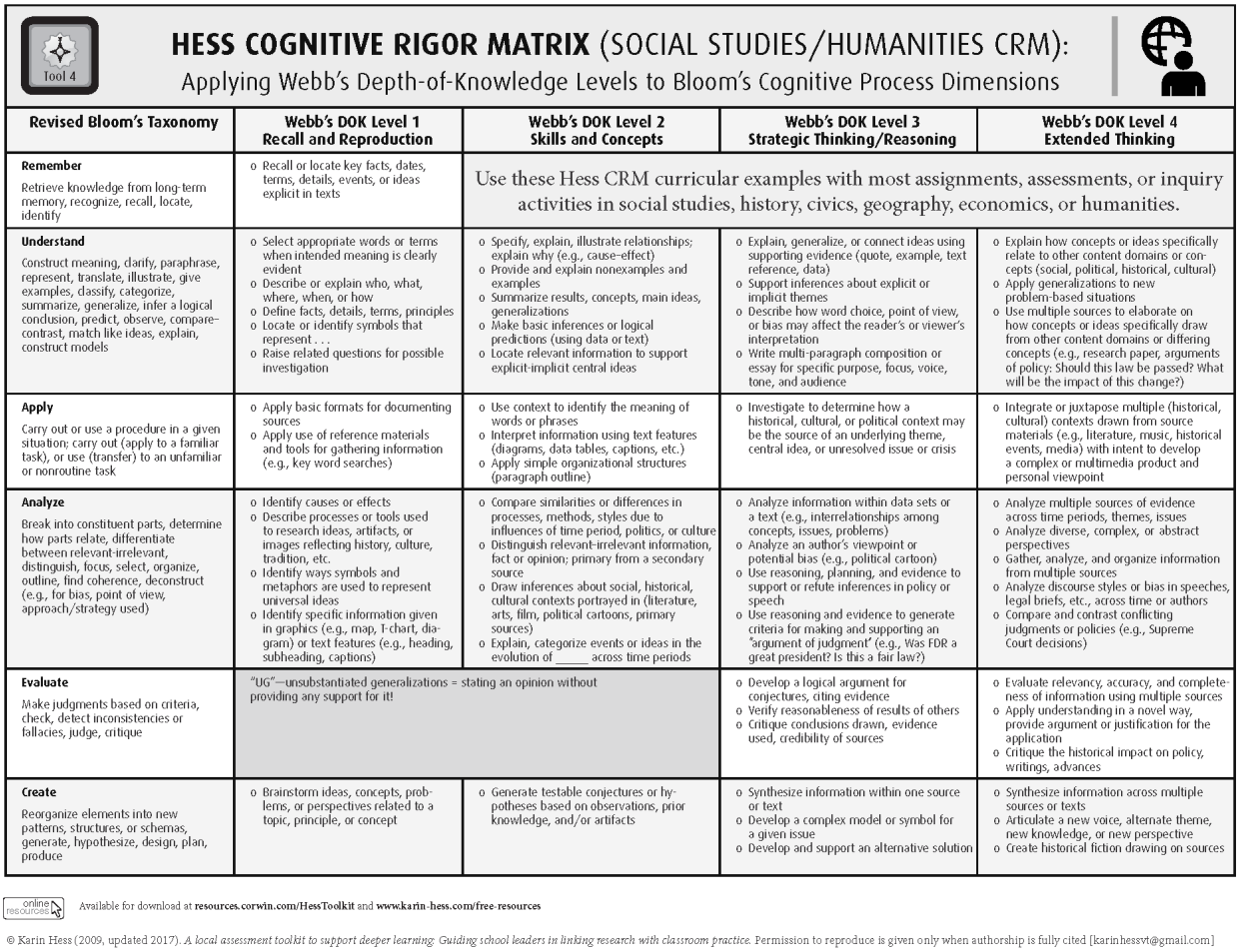
The Hess Cognitive Rigor Matrix was best suited for this study because its framework is useful in categorizing the types of higher order thinking in the questions presented to students. According to Hess et al. (2009a), this model "vividly connects, yet clearly distinguishes the two schemata, allowing educators to examine the rigor associated with the tasks that might seem at first glance comparable in complexity" (p. 5). Additionally, the Hess Cognitive Rigor Matrix links the cognitive complexity of Webb's Depth of Knowledge and the actions of tasks categorized in Bloom's Taxonomy. This allows for each question to be analyzed not only for the type of task that is being asked of the students, but also for the level of cognition students are required to utilize, allowing each question to be examined from multiple perspectives. The Hess Cognitive Rigor Matrix is a reliable and valid framework because it utilizes two very credible frameworks, such as Bloom's Taxonomy and Webb's Depth of Knowledge. Since both Bloom's Taxonomy and Webb's Depth of Knowledge are proven valid and reliable in identifying the level of cognitive complexity of an action or task, the Hess Cognitive Rigor Matrix can also be considered valid and reliable. By using this matrix, various selected questions from the chosen tests and quizzes in one 10th grade social studies textbook series were categorized.

Consultant Coder

A trained second coder participated in the coding. The second coder for this study holds a Doctoral Degree of Education in Education Leadership, Management, and Policy and has participated in similar studies. He has 19 years of public-school education and expertise in leadership, teaching and instructional practices, and curriculum and assessment. The coder has had similar research accepted at national research conferences such as the University Council for Education Administration (UCEA).

Coding Scheme

The use of deductive coding by the researcher and the expert coder guided the coding process. The specific cells within the Hess Cognitive Rigor Matrix acted as the basis for the language of higher order thinking. The Hess Cognitive Rigor Matrix contains sample language to use in questions and tasks related to the various types of thinking. It also includes sample performance tasks and example activities that mimic things students would be asked to do related to each type of thinking by superimposing Webb's Depth of Knowledge framework onto Bloom's Taxonomy. Because the Hess Cognitive Rigor Matrix is designed as a grid, with Webb's Depth of Knowledge as the columns and Bloom's Taxonomy as the rows, a specific numeric code was assigned to each cell in the matrix to provide a more accurate and comprehensive coding scheme. The first number in the matrix described Webb's Depth of Knowledge level and the second number described Bloom's Taxonomy level for each cell. Webb's Depth of Knowledge framework describes thinking in four levels. Level 1 associates with declarative knowledge and recall or imitation thinking. Level 2 associates with procedural knowledge and applying already known procedures in routine situations. Level 3 associates with strategic thinking; thinking about ways knowledge can be used to explain, analyze, draw conclusions, make decisions, or make sense of information. Level 4 associates with extended thinking that encompasses original thinking and augmentation of knowledge in non-routine settings. An example of Hess Cognitive Rigor Matrix for Social Studies/Humanities is shown later (See Figure 6).



HESS COGNITIVE RIGOR MATRIX (SOCIAL STUDIES/HUMANITIES CRM):
Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall and Reproduction	Webb's DOK Level 2 Skills and Concepts	Webb's DOK Level 3 Strategic Thinking/Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	o Recall or locate key facts, dates, terms, details, events, or ideas explicit in texts	Use these Hess CRM curricular examples with most assignments, assessments, or inquiry activities in social studies, history, civics, geography, economics, or humanities.		
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, observe, compare–contrast, match like ideas, explain, construct models	o Select appropriate words or terms when intended meaning is clearly evident o Describe or explain who, what, where, when, or how o Define facts, details, terms, principles o Locate or identify symbols that represent . . . o Raise related questions for possible investigation	o Specify, explain, illustrate relationships; explain why (e.g., cause-effect) o Provide and explain nonexamples and examples o Summarize results, concepts, main ideas, generalizations o Make basic inferences or logical predictions (using data or text) o Locate relevant information to support explicit-implicit central ideas	o Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference, data) o Support inferences about explicit or implicit themes o Describe how word choice, point of view, or bias may affect the reader's or viewer's interpretation o Write multi-paragraph composition or essay for specific purpose, focus, voice, tone, and audience	o Explain how concepts or ideas specifically relate to other content domains or concepts (social, political, historical, cultural) o Apply generalizations to new problem-based situations o Use multiple sources to elaborate on how concepts or ideas specifically draw from other content domains or differing concepts (e.g., research paper, arguments of policy: Should this law be passed? What will be the impact of this change?)
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (transfer) to an unfamiliar or nonroutine task	o Apply basic formats for documenting sources o Apply use of reference materials and tools for gathering information (e.g., key word searches)	o Use context to identify the meaning of words or phrases o Interpret information using text features (diagrams, data tables, captions, etc.) o Apply simple organizational structures (paragraph outline)	o Investigate to determine how a historical, cultural, or political context may be the source of an underlying theme, central idea, or unresolved issue or crisis	o Integrate or juxtapose multiple (historical, cultural) contexts drawn from source materials (e.g., literature, music, historical events, media) with intent to develop a complex or multimedia product and personal viewpoint
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias, point of view, approach/strategy used)	o Identify causes or effects o Describe processes or tools used to research ideas, artifacts, or images reflecting history, culture, tradition, etc. o Identify ways symbols and metaphors are used to represent universal ideas o Identify specific information given in graphics (e.g., map, T-chart, diagram) or text features (e.g., heading, subheading, captions)	o Compare similarities or differences in processes, methods, styles due to influences of time period, politics, or culture o Distinguish relevant-irrelevant information, fact or opinion; primary from a secondary source o Draw inferences about social, historical, cultural contexts portrayed in (literature, arts, film, political cartoons, primary sources) o Explain, categorize events or ideas in the evolution of _____ across time periods	o Analyze information within data sets or a text (e.g., interrelationships among concepts, issues, problems) o Analyze an author's viewpoint or potential bias (e.g., political cartoon) o Use reasoning, planning, and evidence to support or refute inferences in policy or speech o Use reasoning and evidence to generate criteria for making and supporting an "argument of judgment" (e.g., Was FDR a great president? Is this a fair law?)	o Analyze multiple sources of evidence across time periods, themes, issues o Analyze diverse, complex, or abstract perspectives o Gather, analyze, and organize information from multiple sources o Analyze discourse styles or bias in speeches, legal briefs, etc., across time or authors o Compare and contrast conflicting judgments or policies (e.g., Supreme Court decisions)
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique	"UG"—unsubstantiated generalizations = stating an opinion without providing any support for it!		o Develop a logical argument for conjectures, citing evidence o Verify reasonableness of results of others o Critique conclusions drawn, evidence used, credibility of sources	o Evaluate relevancy, accuracy, and completeness of information using multiple sources o Apply understanding in a novel way, provide argument or justification for the application o Critique the historical impact on policy, writings, advances
Create Reorganize elements into new patterns, structures, or schemas, generate, hypothesize, design, plan, produce	o Brainstorm ideas, concepts, problems, or perspectives related to a topic, principle, or concept	o Generate testable conjectures or hypotheses based on observations, prior knowledge, and/or artifacts	o Synthesize information within one source or text o Develop a complex model or symbol for a given issue o Develop and support an alternative solution	o Synthesize information across multiple sources or texts o Articulate a new voice, alternate theme, new knowledge, or new perspective o Create historical fiction drawing on sources

Available for download at **resources.corwin.com/HessToolkit** and **www.karin-hess.com/free-resources**

Figure 6. Hess Cognitive Rigor Matrix Social Studies/Humanities.

Our numerical coding scheme is described later, including the following categories and explanations (adapted from Hess, 2009b).

- (1,1): Webb's Level 1, Bloom's Level 1. Recall, recognize, or locate key facts, dates, terms, details, events or ideas explicit in text. Retrieve knowledge from long term memory, recognize, recall, locate, and identify.
- (1,2): Webb's Level 1, Bloom's Level 2. Select appropriate words or terms when intended meaning is clearly evident. Describe/explain who, what, where, when and how. Define facts, details, terms, and principles. Locate or identify symbols that represent…. Raise related questions for possible investigation. Construct meaning, clarify, paraphrase,

represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, observe, compare contrast, match like ideas, explain, and construct models. The two coders agreed that performance tasks asking students to "describe how or why" must use literal comprehension and verbatim responses.

- (1,3): Webb's Level 1, Bloom's Level 3. Apply basic formats for documenting sources. Apply use of reference materials and tools for gathering information (e.g., key word searches). Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (transfer) to an unfamiliar or nonroutine task.
- (1,4): Webb's Level 1, Bloom's Level 4. Identify causes or effects. Describe processes or tools used to research ideas, artifacts, or images reflecting history, culture, tradition, etc. Identify ways symbols and metaphors are used to represent universal ideas. Identify specific information given in graphics (e.g., map, T-chart, diagram) or text features (e.g., heading, subheading, captions). Break into constituent parts, determine how parts relate, differentiate between relevant or irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias, point of view, approach/strategy used).
- (1,5): Webb's Level 1, Bloom's Level 5. "UG" unsubstantiated generalizations = stating an opinion without providing any support for it. Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique.
- (1,6): Webb's Level 1, Bloom Level 6. Brainstorm ideas, concepts, problems, or perspectives related to a topic, principle, or concept. Reorganize elements into new patterns structures or schemas, generate, hypothesize, design, plan, produce.
- (2,1): Webb's Level 2, Bloom's Level 1. Use these Hess CRM curricular examples with most assignments, assessments, or inquiry activities in social studies, history, civics,

geography, economics, or humanities. Retrieve knowledge from long term memory, recognize, recall, locate, identify.

- (2,2) Webb's Level 2, Bloom's Level 2. Specify, explain, illustrate relationships; explain why (e.g., cause effect). Provide and explain nonexamples examples. Summarize results, concepts, main ideas, generalizations. Make basic inferences or logical predictions (using data text). Locate relevant information to support explicit-implicit central ideas. Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, observe, compare contrast, match like ideas, explain, construct models. The two coders agreed that additional thought is not required in developing predictions but relies on prior knowledge. In addition, inferences and predictions in this category have one clear correct answer.
- (2,3): Webb's Level 2, Bloom's Level 3. Use context to identify the meaning of words phrases. Interpret information using text features (diagrams, data tables, captions, etc.). Apply simple organizational structures (paragraph outline). Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (transfer) to an unfamiliar or nonroutine task. The two coders agreed that paragraphs written in this category are done in a procedural sense based on the writing process.
- (2,4): Webb's Level 2, Bloom's Level 4. Compare similarities or differences in processes, methods, styles due to influences of time period, politics, or culture. Distinguish relevant or irrelevant information, fact opinion— primary from a secondary source. Draw inferences about social, historical, cultural contexts portrayed in literature, arts, film, political cartoons, primary sources. Explain categorize events or ides in the

evolution of _____ across time periods. Break into constituent parts, determine how parts relate, differentiate between relevant or irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias, point of view, approach/strategy used).

- (2,5) Webb's Level 2, Bloom's Level 5. Bloom's Level 5. "UG" unsubstantiated generalizations = stating an opinion without providing any support for it. Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique.
- (2,6): Webb's Level 2, Bloom's Level 6. Brainstorm ideas, concepts, problems, or perspectives related to a topic, principle, or concept. Reorganize elements into new patterns structures or schemas, generate, hypothesize, design, plan, produce.
- (3,1) Webb's Level 3, Bloom's Level 1. Use these Hess CRM curricular examples with most assignments, assessments, or inquiry activities in social studies, history, civics, geography, economics, or humanities. Retrieve knowledge from long-term memory, recognize, recall, locate, identify.
- (3,2): Webb's Level 3, Bloom's Level 2. Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference, data). Support inferences about explicit or implicit themes. Describe how word choice, point of view, or bias may affect the reader's or viewer's interpretation. Write multi-paragraph composition or essay for specific purpose, focus, voice, tone, and audience. Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, observe, compare contrast, match like ideas, explain, construct models. Identify themes. The two coders agreed that this category is considered higher level, so performance tasks in this category do not have

obvious answers and, instead, require students to pull from other sources and develop original ideas.

- (3,3): Webb's Level 3, Bloom's Level 3. Investigate to determine how a historical, cultural, or political context may be the source of an underlying theme central idea, or unresolved issue or crisis. Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (transfer) to an unfamiliar or nonroutine task.
- (3,4): Webb's Level 3, Bloom's Level 4. Analyze information within data sets or a text (e.g., interrelationships among concepts, issues, problems). Analyze an author's viewpoint or potential bias (e.g., political cartoon). Use reasoning, planning, and evidence to support or refute inferences in policy or speech. Use reasoning and evidence to generate criteria for making and supporting an "argument of judgment" (e.g., Was FDR a great president? Is this a fair law?). Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias, point of view, approach/strategy used).
- (3,5): Webb's Level 3, Bloom's Level 5. Develop a logical argument for conjectures, citing evidence. Verify reasonableness of results of others. Critique conclusions drawn, evidence used credibility of sources. Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique.
- (3,6): Webb's Level 3, Bloom's Level 6. Synthesize information within one source or text. Develop a complex model or symbol for a given issue. Develop support for an alternative solution. Reorganize elements into new patterns structures or schemas, generate, hypothesize, design, plan, produce.

- (4,1): Webb's Level 4, Bloom's Level 1. Use these Hess CRM curricular examples with most assignments, assessments, or inquiry activities in social studies, history, civics, geography, economics, or humanities. Retrieve knowledge from long-term memory, recognize, recall, locate, identify.
- (4,2): Webb's Level 4, Bloom's Level 2. Explain how concepts or ideas specifically relate to other content domains or concepts (social, political, historical, cultural). Apply generalizations to new problem-based situations. Use multiple sources to elaborate on how concepts or ideas specifically draw from other content domains or differing concepts (e.g., research paper, arguments of policy: should this law be passed? What will be the impact of this change?). Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, observe, compare contrast, match like ideas, explain, construct models.
- (4,3): Webb's Level 4, Bloom's Level 3. Integrate or juxtapose multiple (historical, cultural) contexts drawn from source materials (e.g., literature, music, historical events, media) with intent to develop a complex or multimedia product and personal viewpoint. Carry out or use a procedure in a given situation; carry out (apply to a familiar task) or use (transfer) to an unfamiliar or non-routine task.
- (4,4): Webb's Level 4, Bloom's Level 4. Analyze multiple sources of evidence across time periods, themes, issues. Analyze diverse complex abstract perspectives. Gather, analyze, and organize information from multiple sources. Analyze discourse styles or bias in speeches, legal briefs, etc., across time or authors. Compare and contrast conflicting judgments or policies (e.g., Supreme Court decisions). Break into constituent

parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias, point of view, approach/strategy used).

- (4,5): Webb's Level 4, Bloom's Level 5. Evaluate relevancy, accuracy, completeness of information using multiple sources. Apply understanding in a novel way, provide argument justification for the application. Critique the historical impact on policy, writings, advances. Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique.
- (4,6): Webb's Level 4, Bloom's Level 6. Synthesize information across multiple sources or texts. Articulate a new voice, alternate theme, new knowledge or new perspective. Create historical fiction drawing on sources. Reorganize elements into new patterns structures or schemas, generate, hypothesize, design, plan, produce.

As per the first coding session, involving coder calibration, the researcher and expert coders agreed that any question placed into Categories 3 and 4 of Webb's levels would be considered higher level, following the guidelines of the Webb Alignment Tool Training Manual (Alt, Ely, Vesperman, & Webb, 2005). These categories demonstrate more cognitive complexity in the types of tasks and questions that are asked of students. Likewise, any questions placed into Categories 1 and 2 of Webb's levels, according to Hess Cognitive Rigor Matrix, would be considered lower level due to the simplicity of the questions being asked.

Coding Process, Data Analysis and Reliability

On October 26, 2019, the researcher met with one expert coder to conduct the initial coder training. Prior to coding individually, a discussion of each cell of the Cognitive Rigor Matrix provided clarity on the types of questions and tasks that would be placed into each category from assessments such as tests and quizzes. This clarification aided in the coding process because the coders aligned key words and phrases found in each question from the tests and quizzes to the examples and explanations provided in the Hess Cognitive Rigor Matrix. The examples and explanations provided further clarify for each cell. The discussion to become familiar with the progression of the cognitive rigor from lower level to higher level allowed for more objective coding. Choices were rationalized in placement along the Cognitive Rigor Matrix by imputing the corresponding explanation from the chosen cell for each question in order to increase validity and reliability throughout the data collection process.

The researcher and the expert coder reviewed the Webb Alignment Tool and began to calibrate to the categories found on the Hess Cognitive Rigor Matrix during this initial coder training. The training session began with unpacking the rubric according to each level of Webb's Depth of Knowledge separately, following the Webb Alignment Tool pages 70 and 71. The reading of the corresponding categories of the Hess Cognitive Rigor Matrix familiarized the coders with how Webb's DOK intersects with Bloom's Taxonomy on the Cognitive Rigor Matrix. The team discussed the clarifications made in order to reach consensus on the meanings of the examples presented in each cell of the matrix.

On October 27, 2019, the researcher and the expert coder began the first coding session using publicly available question prompts from a Social Studies textbook designed for

10th grade students in a U.S. History 1 class. The categorization of each question followed the Webb's DOK levels. The researchers then held a discussion regarding the placement of each question in the Hess Cognitive Rigor Matrix at the appropriate intersection with Bloom's Taxonomy after reaching a consensus on the Webb's DOK level for a particular question. Eleven questions reached 100% agreement after utilizing the consensus read-behind method and preserved in a coding table created by Sydoruk (2018), to organize each question and to visually represent individual categories for each question. In addition, the table also served as a means for checking the alignment between the coding as part of the read-behind method. The expert coder assisted with flagging any questions that did not receive the same placement so that a discussion could ensue and consensus could be reached. Figure 7 represents an example of the coding agenda used for this study. Appendix C displays the final coding tallies from the Micro Soft Excel sheet.

	A,1	*A,2*	*A,3*	*A,4*	*A,5*	*A,6*	*B,2*	*B,3*	*B,4*	*B,5*	*B,6*	*C,2*	*C,3*	*C,4*	*C,5*	*C,6*	*D,2*	*D,3*	*D,4*	*D,5*	*D,6*

Figure 7: Sample Coding Agenda for English Language Arts (ELA) Standards.

Then, the researcher and expert coder agreed that any question placed into Categories 3 and 4 of Webb's levels would be considered higher level, following the guidelines of the Webb's Alignment Tool training manual (Alt, Ely, Vesperman, & Webb, 2005). Catergories 3 and 4 demonstrate more cognitive complexity in the types of tasks and questions that are asked of students. Likewise, any questions placed into Categories 1 and 2 of Webb's levels, according to

the Hess Cognitive Rigor Matrix would be considered lower level due to the simplicity of the questions being asked. The coders conducted an initial practice coding session of 10 question prompts from one of the quizzes. A line-by-line coding began for each question and then categorized individually according to the language on the Hess Cognitive Rigor Matrix. Utilizing the double-rater read behind model increase reliability among coders (Huberman, Miles, & Saldana, 2014, p. 84).

The researcher and expert coder compared results when categorizing each question to the Hess Cognitive Rigor Matrix following the double-rater read behind consensus model to ensure the reliability of coding. The trained researcher used the double-rater read behind consensus model through calibration exercises, conducted by an experienced independent coder prior to the first practice session. The two coders participated in deductive coding exercises during these calibration sessions.

A second calibration session was held on November 5, 2019, with an additional expert coder joining this session. The researcher and two expert coders conducted a calibration session with a total of 11 questions. Individual discussions regarding each question took place, as well as the reasoning behind assigning a cell to each question during each calibration session. This consistent communication also ensured agreement upon the placement of each question through the use of comments on a shared data collection document, e-mail, and telephone conversations. The use of the double-rater read-behind consensus model increased inter-rater reliability and offered a means of calculating and monitoring the coders' agreement (Huberman, Miles, & Saldaña, 2014, p. 84).

The researcher and two expert coders practiced with sets of 11 questions until achieving 80% exact accuracy. The team achieved an exact agreement on 10 out of the 11 questions during

the coding session after using the double-rater read behind method and consulting the Webb's Alignment Tool Training Manual. For each question in each set the team explained their categorization of the question into a specific cell and held a discussion in order to reach an agreement. The team calculated and recorded the percentage of agreement after each set. Questions the team did not originally place into the same category were marked in red to signify that there was a difference of opinion that required deliberation. A protocol for deliberations took place. First, the team explained their evidence for their categorization. Then, the team reviewed the language of the Hess Cognitive Rigor Matrix and Webb's DOK Framework and compared it with the language of the question under deliberation. The team reviewed exemplar questions related to the categories under deliberation. Following the recommendation from the Webb's Alignment Tool Training Manual questions should be categorized at the higher rating if consensus could not be reached. For example, if a member of the team categorized the question as a *Level 1 Understanding*, and the other coder categorized the question as a *Level 2 Understanding*, the question would be categorized as a *Level 2 Understanding*. The protocol used in this study modeled those of similar studies in order to provide a consistent methodology in the topic area (Miles et al., 2014; Lagunoff, Sato, & Worth, 2011; Sforza, 2014). Two out of the three members of the team reviewed the remaining tests and quizzes, code them individually, and compared the results at a later date. The team agreed to discuss only those questions that were coded differently.

Aligned to English language arts performance tasks the Webb's and Bloom's models increased reliability among researcher and the expert coders. The Webb Alignment Tool Training Manual pages 14-15 provided detailed descriptions of ways in which English language arts tasks are organized based on cognitive complexity (Alt, Ely, Vesperman, & Webb, 2005).

The alignment tool provided the following descriptions of each level in order to provide further clarity and to reduce discrepancies between each level when coding. In language arts, four DOK levels were used to judge both reading and writing objectives and assessment tasks. The reading levels are based on Valencia and Wixson (2000, pp. 909-935).

Reading Level 1. Level 1 requires students to receive or recite facts or to use simple skills or abilities. Oral reading that does not include analysis of the text, as well as basic comprehension of a text, is included. Items require only a shallow understanding of the text presented and often consist of verbatim recall from text, slight paraphrasing of specific details from the text, or simple understanding of a single word or phrase. Some examples that represent but do not constitute all of, Level 1 performance are:

- Support ideas by reference to verbatim or only slightly paraphrased details from the text.
- Use a dictionary to find the meanings of words.
- Recognize figurative language in a reading passage.

  Reading Level 2. Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response; it requires both comprehension and subsequent processing of text or portions of text. Intersentence analysis of inference is required. Some important concepts are covered, but not in a complex way. Standards and items at this level may include words such as summarize, interpret, infer, classify, organize, collect, display, compare, and determine whether fact or opinion. Literal main ideas are stressed. A Level 2 assessment item may require students to apply skills and concepts that are covered in Level 1. However, items require closer understanding of text, possibly through the item's paraphrasing of both the question and the answer. Some examples that represent, but do not constitute all of, Level 2 performance are:

- Use context cues to identify the meaning of unfamiliar words, phrases, and expressions that could otherwise have multiple meanings.
- Predict a logical outcome based on information in a reading selection.
- Identify and summarize the major events in a narrative.

Reading Level 3. Deep knowledge becomes a greater focus at Level 3. Students are encouraged to go beyond the text; however, they are still required to show understanding of the ideas in the text. Students may be encouraged to explain, generalize, or connect ideas. Standards and items at Level 3 involve reasoning and planning. Students must be able to support their thinking. Items may involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge. Items may also involve more superficial connections between texts. Some examples that represent, but do not constitute all of, Level 3 performance are:

- Explain or recognize how the author's purpose affects the interpretation of a reading selection.
- Summarize information from multiple sources to address a specific topic.
- Analyze and describe the characteristics of various types of literature.

Reading Level 4. Higher order thinking is central and knowledge is deep at Level 4. The standard or assessment item at this level will probably be an extended activity, with extended time provided for completing it. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require the application of significant conceptual understanding and higher order thinking. Students take information from at least one passage of a text and are asked to apply this information to a new task. They may also be asked to develop hypotheses and perform

complex analyses of the connections among texts. Some examples that represent, but do not constitute all of, Level 4 performance are:

- Analyze and synthesize information from multiple sources.
- Examine and explain alternative perspectives across a variety of sources.
- Describe and illustrate how common themes are found across texts from different cultures are also involved.

A third calibration session was held on December 4, 2019, with the researcher and one expert coder to discuss 20 questions in sets of 10. The remaining questions were coded individually previous to the calibration session. Utilizing the double-rater read behind consensus model ensured the reliability of the questions coded. In the first set of 10, the coders had 80% total agreement. One question was moved from [B,4] to [B,2] upon discussion of the wording of the question and the task that was being asked of the students. Another question was increased in cognitive complexity from [A,2] to [B,2] after the two coders discussed that due to the answer choices in the multiple-choice format, students would need to use inference skills in order to successfully answer the question. The second set had 80% agreement with both questions.

A fourth and final calibration session was completed on December 29, 2019. During this session, the remaining questions from the sample of all 287 publicly available 10th grade test and quiz questions were recalibrated in an effort to complete a final review in 14 tests of approximately 26 questions, in which the coders had 89.5% exact initial agreement. The consensus method was used to reach agreement on the remaining 15% of questions. On Chapter 1, Form A, the two coders completed 26 questions with a 92% total agreement on the Chapter 1 Test, Form A in which several multiple-choice questions were lowered from [A,2] to [A,1]

following a discussion on how students at a 10th grade level should have prerequisite knowledge of the content described in the wording of the question. The two coders agreed that the cognitive complexity was lessened due to the questions being multiple choice in nature and the students simply selecting the correct answer. This movement from [A,2] to [A,1] became standard practice throughout the coding of the remaining tests based off the similar format of each test. Additionally, one question was moved from [C,4] to [C,3] following a discussion how question investigates to determine how a historical, cultural, or political context may be the source of an underlying theme, central idea, or unresolved issue or crisis.

On Chapter 2: American Revolution Assessment, the two coders completed a total of 24 questions with 67% agreement. On this test, three questions were moved from [B,3] to [A,4] following a discussion of students identifying specific information given in graphics (e.g., maps, T-chart, diagram, or text features. One question was moved from [A,2] to [A,1] following a discussion that the question is asking students to simply recall facts. Two questions were moved from [B,3] to [B,2] because students are being asked to specify, explain, and illustrate relationships of cause and effect. One question was moved from [C,2] to [C,4] following a determination that the use of reasoning and evidence to generate criteria for making and supporting and argument requiring multiple paragraphs was required. One question was moved from [C,3] to [B,4] following a discussion regarding the wording of the questions as it asks the students to explain why. On the American Revolution quiz, the coders completed 8 questions with 100% agreement.

On Chapter 3 Test, Form A, the coders completed 28 questions with 100% agreement. On Chapter 4 Test, Form A, the coders completed 27 questions with 93% agreement. One question was moved from [A,2] to [C,3] following a discussion based on wording of the question

and the task being asked of the students. Additionally, one questions being lowered in cognitive complexity was moved from [C,4] to [C,3]. On Chapter 5 Test, Form A, the coders completed 27 questions with 93% agreement. One question was lowered from [C,4] to [C,2] following a discussion regarding the differences being asked of students when responding to the verbs "explain" and "analyze." One question was moved from [C,2] to [B,4] following a discussion regarding the wording that asks students to draw inferences about social and historical culture.

On Chapter 6 Test, Form A, the coders completed 27 questions with 100% agreement. Chapter 6 Test, Form B the coders completed 5 questions with 40% agreement. One question was moved from [A,2] to [B,4], as the wording suggests that students explain and characterize inferences and ideas. One question was lowered from [C,2] to [B,2] after a discussion regarding the wording as it suggests that students draw inferences about social, historical and cultural context. One additional question was lowered from [C,3] to [B,4] following a discussion, once again, about the wording, that suggested that students draw inferences about social, historical and cultural context. On Chapter 7 Test, Form A, the coders completed 27 questions with 93% agreement. One question was moved from [C,2] to [A,2], as students are not asked to use supporting evidence in their responses. One question was moved from [C,3] to [C,4] following a discussion regarding the wording in which it suggests that students analyze text and the author's viewpoint. On Chapter 9 Test, Form A the coders completed 25 questions with 100% agreement.

On Chapter 9 Test, Form B, the coders completed a total of 6 questions with 83% agreement. One question was moved from [B,4] to [C,4] following a discussion about the wording in which the wording suggests that students use reasoning and evidence to generate the criteria for making and supporting an argument or judgement in their own words. On Chapter 10 Test, Form A, the coders completed 26 questions with 88% agreement. One question was

lowered from [B,2] to [A,2], as the coders discussed that the wording asked the students to describe the work of a historical figure, which lends itself to remember, recall, and reproduction. One question was moved from [C,3] to [C,5] following a discussion of the specific wording in the question. This question asked the students to assess, speculate, and connect a historical law regarding racial segregation. Additionally, one question was lowered from [C,4] to [C,2] as the wording suggested that students to support inferences explicit or implicit themes.

On Chapter 11 Test, Form A, the coders completed 24 questions with 88% agreement. One question was moved from [B,3] to [C,4] after a discussion related to the wording of this question. The two coders determined that analyzing, inferring and hypothesizing are all higher order thinking skills. One question was moved from [C,2] to [C,4] following a discussion, once again, about the words within the question. Students are being asked to cite evidence that supports their conclusion, which is also a higher order thinking skill. One question was moved from [C,4] to [C,5], resulting in a discussion about the use of the words assess, analyze and draw, and critique conclusion. On Chapter 13, Form B the coders completed 7 questions with 100% agreement.

An independent auditor reviewed 16% of the test questions with 100% agreement as another step in the reliability process. An independent auditor is important so that auditor's opinion can be impartial, unbiased, and free from any undue influence or conflict of interest to override the professional judgement of the trained coders. The aim of independence is to maintain the ability to keep an impartial practice when practicing professional judgement, which is vital for the integrity of the independent auditor's opinion to be maintained.

Chapter Summary

Chapter III described the coding protocol used to align various social studies questions from assessments, such as tests and quizzes to the Hess Cognitive Rigor Matrix. For this study, a mixed method content analysis research methodology was utilized to answer the research questions. Mixed methods integrate both quantitative and qualitative data, yielding additional insight beyond the information provided by either qualitative or quantitative data alone. Additionally, Mayring's (2000) step model for deductive category application was used to create a visual representation of the research process, including methods to ensure credibility in the overall study. As indicated in this chapter, examples, definitions, and coding rules were evident and thus placed into a specific; organized coding agenda.

Chapter IV will present the findings of the study, with an analytical focus on answering all three research questions as presented in the aforementioned chapters.

Chapter IV
RESULTS

The following chapter presents the findings of the study on the type of thinking that is being promoted in a 10th grade social studies textbook based on the questions provided on test and quizzes. This study aimed to categorize and analyze the frequency and percentage of higher order thinking in a 10th grade social studies textbook by categorizing questions found on tests and quizzes. A sample size of 287 questions were used in this mixed method case study.

The researcher and two trained expert coders participated in four coding sessions in which they utilized the double-rater-read behind consensus model to discuss and categorize each question from the sample of tests and quizzes. The coding sessions took place between October 27, 2019 and December 29, 2019. The Hess Cognitive Rigor Matrix provided an alignment tool for the researcher and expert coders. Appendix A reveals a copy of the Hess Cognitive Rigor Matrix accompanied by coder annotations. An agreement was reached during the first coding session that questions placed into the third and fourth levels of Webb's Depth of Knowledge, as identified in the Hess Cognitive Rigor Matrix, would be considered higher order thinking, as these questions invite students to extend thinking beyond the text and connect ideas to real-world situations using planning and reasoning. Higher order thinking categories are, as such, [C,2], [C,3], [C,4], [C,5], [C,6], [D,2], [D,3], [D,4], [D,5], and [D,6].

The researcher and expert coders utilized the double-rater read behand model to reach alignment of each question found on assessments such as tests and quizzes. This model enabled the team to discuss placement of each question to the Hess Cognitive Rigor Matrix and to determine a rational for their decision. The double-rater read behind consensus model is considered an effective method for increasing inter-rater reliability (Milnes et al., 2014; Sato et

al., 2011). The team discussed the placement of each question throughout the four calibration sessions held. The team considered each question before assigning it into a specific category and examined the difference in placement until an agreement was met. Questions in each category of the Hess Cognitive Rigor Matrix and the percentage calculated after coding was discussed for each question.

This chapter presents findings predicated on the research questions aforementioned in the previous chapters. A case study with mixed methods was utilized. A case study is an in-depth description and analysis of a bounded system (Merriam, 2009 p. 40). To continue, Yin (2008) states that a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p. 18). Wolcott (1992) sees it as "an end-product of field-oriented research" (p. 36) rather than a strategy or method.

A case study may also be selected because it is intrinsically interesting: a researcher could study it to achieve as full an understanding of the phenomenon as possible (Merriam, 2009 p. 42). Although Merriam (2009) definition of a qualitative case study is that of an in-depth description analysis of a bounded system, it is congruent with other definitions (Biklen & Bogdan, 2007; Cresswell, 2007; Patton, 2002; Stake, 2005). According to Yin (2008), a case study is defined as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p.18). According to Bogdan and Biklen (2014), a case study was defined as a detailed examination of a single or one setting, or single subject, a single depository of documents, or a particular event (p. 271). Wolcott (1992) sees it as "an end product of field-oriented research" (p. 36) rather than a strategy or a method.

The case study design was best suited for this study because it provided tools from which to study complex phenomenon with their contexts. Additionally, this is a particularly appealing design for educational studies (Merriam, 2009). With discussion on complexity thinking in regard to students across grade levels and its impact on the pedagogical awareness it is necessary that all stakeholders evaluate current curriculum to ensure that it is designed to promote those necessary skills.

This case study was guided by two subquestions and used as the main focus in interpreting and collecting data from assessments, such as tests and quizzes in a grade 10 social textbook.

Qualitative Findings

The first subquestion was: *In what way(s) does the language found on tests and quizzes of a 10th grade social studies textbook associate with language that promotes higher order thinking found in research literature?*

According to the Hess Cognitive Rigor Matrix, the lowest level of cognitive complexity was assigned to Level 1, in accordance with Webb's Depth of Knowledge, as it invites students to simply recall and/or reproduce facts, dates, key ides, etc. The complexity of the task increases within Level 1 in accordance with six levels of Bloom's Taxonomy. The Hess Cognitive Rigor Matrix contains the following cells representing the lowest level of cognitive complexity: [A,1], [A,2], [A,3], [A,4] and [A,6]. Each of the questions placed in the Level 1 category displayed similar themes in nature as to how the information was retrieved in that students were able to use simple procedures to answer the question by copying, computing, defining, or recognizing information directly from the text. The next level of cognitive complexity was assigned to Level 2, in accordance with the Webb's Depth of Knowledge, as it invites students to utilize skills and

concepts. The complexity of the task increases within Level 2 in accordance with the six levels of Bloom's Taxonomy. The Hess Cognitive Rigor Matrix contains the following cells representing the second level of cognitive complexity: [B,2], [B,3], [B,4], and [B,6]. Each of the questions placed in the Level 2 category also displayed similar themes in nature as to how the information was retrieved in that they required engagement of some mental processing beyond recalling. The content knowledge and/or mental process involved in answering a Level 2 question is more complex than that of a Level 1 question, as students are required to make some decisions on how to approach the question or problem.

Out of the 287 questions analyzed, 219 were placed in [A,1 Webb's Depth of Knowledge Level 1, Bloom's Taxonomy Recall] cell of the matrix, totaling 76.3% of the total questions. [A,1] is the lowest level of the matrix. All of the questions placed into this category asked students to recall, reproduce and/or locate key facts, dates, terms, details, events, or ideas explicit in text. All 219 questions in this category were presented in multiple choice format consisting of a problem, known as the stem, and a list of suggested solutions, known as alternatives.

Alternatives consist of one correct or better choice, which is the answer, and an alternate inferior known as a distractor. An example of an [A,1] question found on the assessment was the following: _____ *leaders of Spanish expeditions in regions around what is New Mexico*. Student are asked to select the correct answer from a word bank consisting of 10 terms labeled A-J. An additional example of a [A,1] question found on the assessment was the following: *Most people enslaved in African societies were* _____. Once again students are asked to fill in the blank by selecting the correct phrase from four choices in multiple choice format labeled A-D. Both questions were placed into the [A,1] category due to lack of the question's cognitive complexity.

Similarly, 12 questions were placed in [A,2 Webb's Depth of Knowledge Level 1, Bloom's Taxonomy Understand/ Literal Comprehension] cell of the matrix, totaling 4.2% of the total questions analyzed. An example of a question with language aligned to [A,2] found on the assessment was the following: *What were some of the things that Europeans and Native Americans exchanged with each other?* Students were asked to describe or explain "what" by defining facts, details, or terms. Another example of a [A,2] question was the following: *What groups of people supported the ratification of the new Constitution, and why did they support it?* This question asked students to provide and explain examples and/or summarize that aligns to language found on the Level 2 of the Bloom's Taxonomy. There were no questions placed in [A,3]. Four questions were placed in the [A,4 Webb's Depth of Knowledge Level 1, Bloom's Taxonomy Analysis] cell of the matrix, totaling 1.4% of the questions analyzed. An example of a question with language that aligned to [A,4] found on the assessment was the following: *Which statements are accurate based on the information presented in the map? Select all that apply*. Students were asked to selected from five choices labeled A-E. This question aligns to the [A,4] language, as it requires students to identify specific information given on a map. There were no questions placed on [A,5] or [A,6].

Additionally, 17 questions were placed in the [B,2 Webb's Depth of Knowledge Level 2, Bloom's Taxonomy Understand/ Literal Comprehension] cell of the matrix, totaling 5.9% of the questions analyzed. An example of a question with the language that aligns to [B,2] was the following: *What was the Industrial Revolution? Describe how it affected American society.* This question asks student to specify, explain, illustrate relationships, and explain why (cause and effect). One question was placed in the [B,3 Webb's Depth of Knowledge Level 2, Bloom's Taxonomy Application] cell of the matrix, totaling 0.3% of the questions analyzed. An example

of a question with the language that aligns to [B,3] was the following: *Referring to the graph above, what can you deduce about the South's financial position going into the Civil War?* The question asks student to interpret information using text features, such as diagrams, data tables, or captions. Seven questions were placed in the [B,4 Webb's Depth of Knowledge Level 2, Bloom's Taxonomy Analysis] cell of the matrix, totaling 2.4% of the questions analyzed. An example of a question with the language that aligns to [B,4] was the following: *Explain what made the period from 1828 to 1848 an era of reform in the United States. What problems did people see in American society, and how did reformers try to solve these problems?* This question asks students to analyze the information by comparing similarities or differences in processes, methods, and styles due to influences of time period, politics, or culture. There were no questions placed in [B,5] or [B,6].

Five questions were placed in the [C,2] Webb's Depth of Knowledge Level 3, Bloom's Taxonomy Understand] cell of the matrix, totaling 1.7% of the questions analyzed. An example of a question with language that aligns to [C,2] was the following: *Explain how the Industrial Revolution changed the role of women in American society and contributed to the emergence of the early women's movement of the 1840s.* This question asks students to explain, generalize, or connect ideas using supporting evidence, such as quotes, examples, text references, or data. Two questions were placed in the [C,3 Webb's Depth of Knowledge Level 3, Bloom's Taxonomy Application] cell of the matrix, totaling 0.7% of the questions analyzed. An example of a question with language that aligns to [C,3] was the following: *Explain the issue of the Confederation Congress's debts, and describe both James Madison and Alexander Hamilton's arguments on this issue.* The question asks students to investigate to determine how historical, cultural, or political context may be the source of an underlying theme, central idea, or

unresolved issue or crisis. Additionally, 18 questions were placed in the [C,4 Webb's Depth of Knowledge Level 3, Bloom's Taxonomy Analysis] cell of the matrix, totaling 6.3% of the questions analyzed. An example of a question with language that aligns to [C,4} was the following: *Describe the events referred to by President James K. Polk in the excerpt above and explain how they raised tensions between the United States and Mexico, finally leading to war between the two countries.* This question asks students to analyze information within text, such as interrelationships among concepts, issues, problems – analyze author's viewpoint or potential bias – use reasoning and evidence to generate criteria for making and supporting and argument of judgement – for example, was FDR a great president? Is this a fair law? Finally, two questions were placed in [C,5 Webb's Depth of Knowledge Level 3, Bloom's Taxonomy Evaluation] of the matrix, totaling 0.7% of the questions analyzed. An example of a question with language aligned to [C,5] was the following: *Assess the excerpt above. Analyze the consequences of this view for General Custer and draw conclusions about the ultimate effect this view had for Native Americans.* This question asks students to develop a logical argument for conjectures, citing evidence, critique conclusions drawn, evidence used, credibility of sources through verifying reasonableness of results of others.

There were no questions placed in [C,6]. None of the questions included language that associated with Webb's Depth of Knowledge Level 4 [D,2], [D,3], [D,4], [D,5], or [D,6], the highest level of the matrix.

Quantitative Findings

The second subquestion was: *What is the frequency and percentage of higher order thinking, as described by the Hess Cognitive Rigor Matrix, embedded in Social Studies questions required of 10th grade students during assessments such as tests and quizzes?* The researcher and the two expert coders agreed that questions categorized as Level 3 and Level 4 of the Hess Cognitive Rigor Matrix consist of higher order thinking tasks and would be placed as such. The cells for Level 3 are [C,2], [C,3], [C,4], [C,5], and [C,6]. Level 4 cells consist of [D,2], [D,3,], [D,4], [D,5] and [D,6]. Out of the 287 questions analyzed 260 included language that aligned with lower level thinking (see Table 1 and Figures 8 & 9).

Table 1

Distribution of Thinking Requirements on the Tests and Quizzes of a Grade 10 Social Studies Textbook

DOK 1 Recall	DOK 1 Understd	DOK 1 Analysis	DOK 2 Understd	DOK 2 Apply	DOK 2 Analysis	DOK 3 Understd	DOK 3 Analysis	DOK 3 Evaluate
219	12	4	17	1	7	5	18	2

Note: Questions categorized according to the Hess Cognitive Rigot Matrix (Hess et al., 2009a; 2009b).

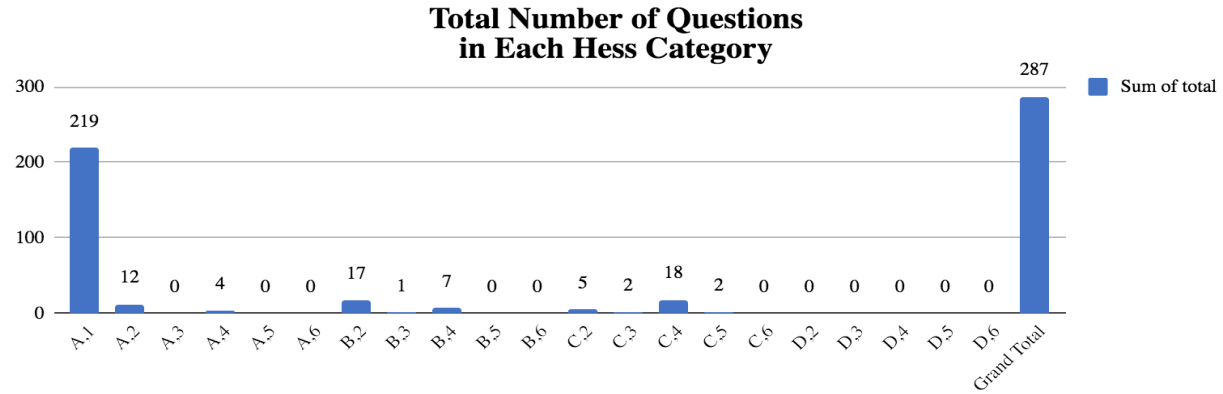


Figure 8. Total number of questions in each Hess category. (Hess et. al. 2009a; 2009b).

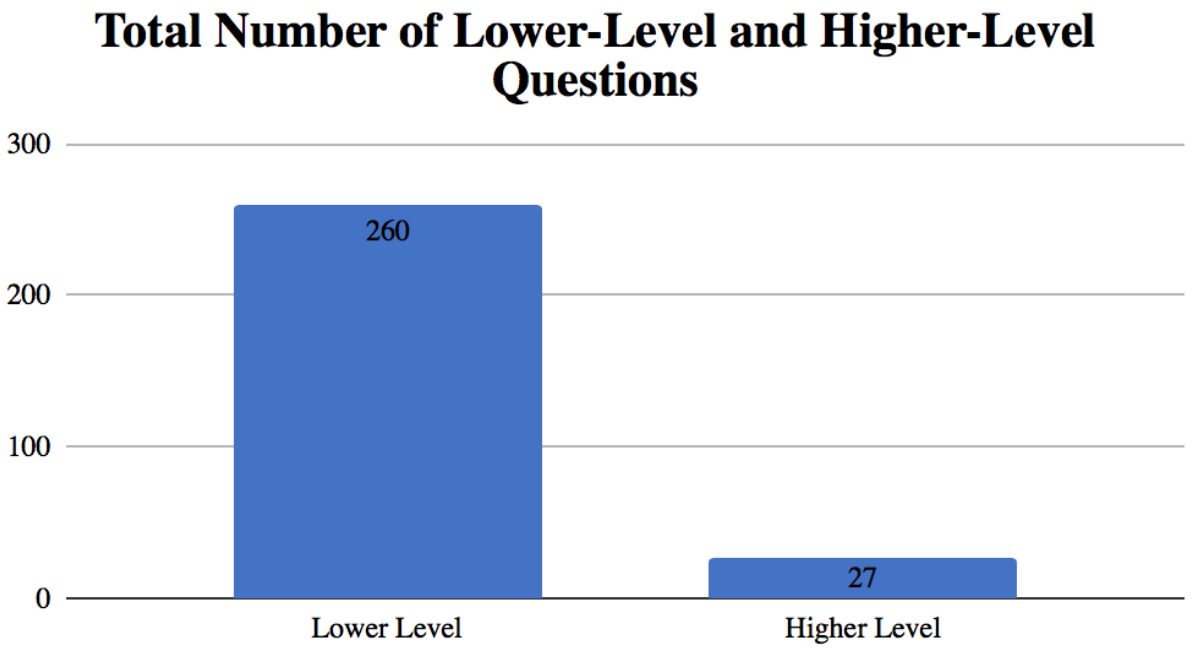


Figure 9. Total number of lower level and higher-level questions.

Almost 91% (90.6%) of the questions were categorized as lower level questions requiring students to recall and reproduce and/or use skills and concepts. In addition, 9.4% of the total questions analyzed were categorized as higher-level questions requiring cognitive complexity through strategic thinking, reasoning, and extended thinking.

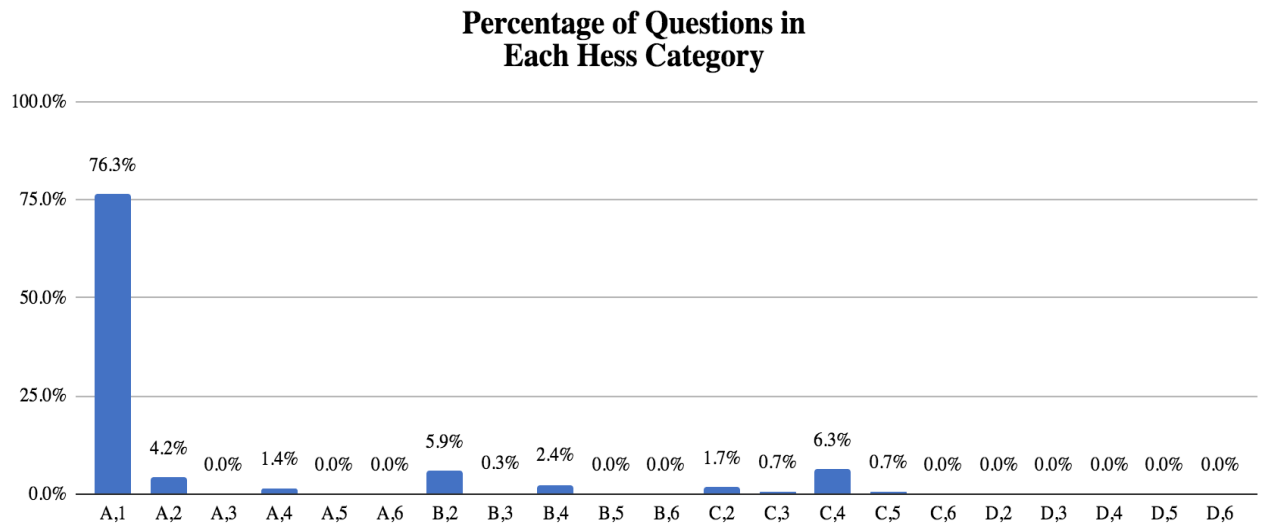


Figure 10. Percentage of questions in each Hess category.

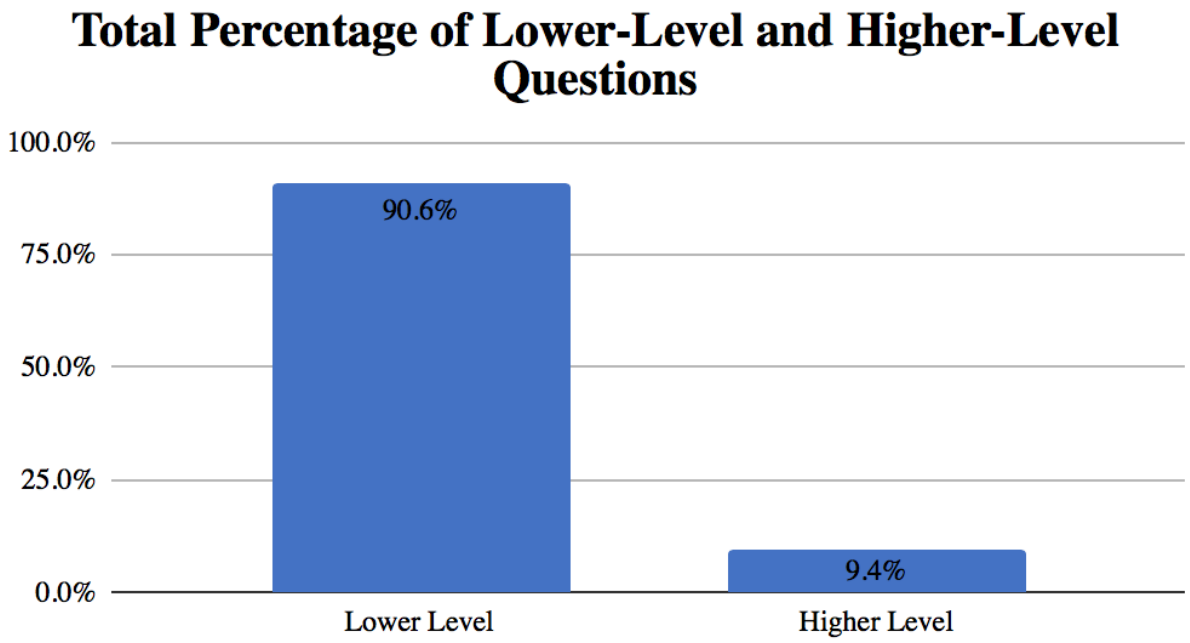


Figure 11. Total percentage of lower level and higher-level questions.

The cell with the highest level of frequency was [A,1], which had 219 questions, making up 76.3% of the total questions analyzed. Questions placed in this category required students to recall or locate key facts, dates, terms, details, events, or ideas explicit in the text by retrieving

knowledge from long-term memory. [A,1] is the lowest level cell, where Recall and Reproduction of the Hess Cognitive Rigor Matrix intersects with Remember of Bloom's Taxonomy. Each of the 219 questions were identical in nature as to how information was retrieved by asking students to select from multiple choice responses.

Conclusion

The purpose of this study was to determine the types of questions being promoted in a 10th grade social studies classroom. The Hess Cognitive Rigor Matrix was used to analyze the level of cognitive complexity that aligned with Webb's Depth of Knowledge and the complexity of the question that aligned with Bloom's Taxonomy. Questions that were placed in Levels 3 and 4 of Webb's Depth of Knowledge, along the Hess Cognitive Rigor Matrix, were determined to be higher level thinking, as the questions required the students to engage in higher order thinking skills in an effort to answer the questions effectively.

In response to the first research question, the data analyzed revealed the following trends from the 287 questions taken from 10th grade social studies tests and quizzes:

- Out of the 287 questions, 260 were categorized as lower-level questions, equating to 96.0% of all questions analyzed.
- Out of the 287 questions, 27 were categorized as higher-level questions, equating to 9.4% of all questions analyzed.
- The cell with the highest frequency was [A,1]. Questions in this cell asked students to recall or locate key facts, dates, terms, details, events, or ideas explicit in texts according to Webb's Depth of Knowledge aligned with first Bloom's Taxonomy level Remember.
- Two questions were placed in the [C,5] cell, with no other questions going beyond that cell.

Chapter V includes a summary of the methodology and a discussion of the findings as they relate to the two subquestions, as well as implications for policy and practice, and future research recommendations.

CHAPTER V
CONCLUSION

This chapter provides a summary of the study, including comments on the findings as they relate to the overarching research question and two subquestions, a conclusion, implementations for policy and practice, and recommendations for future research. The qualitative content analysis study aimed to describe the level of distribution of higher order thinking being promoted within a 10th grade social studies textbook. For this study, 287 questions from 10th grade textbook's tests and quizzes were examined using the Hess Cognitive Rigor Matrix. The questions aligned with the New Jersey Student Learning Standards (NJSLS). According to this study, no empirical evidence exists in the 10th grade social studies textbook to promote higher order thinking skills.

Methodology Summary

The theoretical framework used for this study was Hess Cognitive Rigor Matrix, which superimposes Webb's Depth of Knowledge and Bloom's Taxonomy. Webb's Depth of Knowledge classifies the degree of cognitive complexity needed of a task and contains levels 1 through 4. Level 1 contains very little cognitive sophistication and requires only memory recall. Level 1 questions depend on basic operations that don't require analysis of text. (Webb et al., p.70, 2005). Level 2 questions are also known to be simpler because the level of cognitive sophistication does not lead to research or detailed thinking. Level 3 is considered higher because it allows students to do more complex thinking to answer questions like rationalization and abstract idea recognition. Level 4, the highest Webb Depth of Knowledge level allows students to expand their understanding and learning beyond what is being asked. Much of the Level 4 requirement requires students to expand the knowledge from one text to another and to

apply real-life experiences to multiple situations (p.71). Both Level 3 and 4 of Bloom's Taxonomy encourage higher level thought by building up from lower level cognitive thinking. The six levels of Bloom's embedded into the Hess Cognitive Rigor Matrix, starting with the lowest level, are remember, understand, apply, analyze, evaluate, and create. Each level increases as the level of thought required to answer each question increases.

This case study employed a qualitative content analysis to answer the first subquestion: *In what way(s) does the language found on test and quizzes of a 10th grade social studies textbook associate with the language that promotes higher order thinking found in research literature?* One expert coder and the researcher used deductive category application, in accordance with Mayring (2000), to place each question in the appropriate cell of the Hess Cognitive Rigor Matrix. Webb's Depth of Knowledge and Bloom's Taxonomy were used to assign each cell to the matrix based on the different levels. An example of a matrix is [A,1], which is Webb's Level 1 (recall and reproduce) and Bloom's first level (remembers). The double-rater read behind consensus model was used in the study to increase inter-rater reliability and assist the expert coder and researcher with placement of each question after a discussion took place. The expert coder and researcher held three conferences via telephone and one in-person conference in an effort to calibrate and discuss the questions in sets of 10 and 20 questions at a time. To further ensure credibility, the data collection process, including the double rater read behind consensus model and Webb's Alignment Tool calibration, were compared with previous studies that had used the same or similar methods.

Conclusion

The conclusion of this case study has revealed that 90.6% of the test questions are promoting lower level thinking, creating functional fixedness as opposed to critical thinking. A consistent focus on lower level declarative and procedural thinking can stunt the complex thinking development of students and lead to functional fixedness. Dunker (1945) described functional fixedness as the phenomenon of one perceiving an entity as having only one function (as cited by Anderson & Johnson, 1966). Functional fixedness is one difficulty that has arisen in encouraging innovation in the classroom. Runco and Chand (1995) also explained the concept of functional fixity as the "rigidity or mental set that locks out thinking so that an individual can't see alternatives" (p. 247).

Functional fixedness is present in the way students are taught to learn about critical thinking and the challenges of creative thinking. In schools, students learn to approach a problem using specific methods and strategies. It then becomes impossible for students to think about other possible solutions or ways of solving a problem when they are stuck in the belief that there is one correct way. Anderson and Johnson (1966) built on functional fixity to include the idea of Einstellung, which is the challenge of using other techniques to solve an issue after mastering one strategy (p. 852). Students become unable to think creatively and/or design original solutions to ill-structured problems when they are consistently made to use one process, find one correct answer, and/or regurgitate facts and figures to arrive at a predetermined outcome.

In an experiment conceived in 1992, Runco and Chand (1995) explored how students use their ability to think creatively depending on how tasks were presented to them. Tasks and activities exerted a significant influence that explicitly asked students to develop multiple

approaches or think creatively, but no significant influence was found in tasks that allowed students to produce a question. Similarly, Runco and Chand (1995) found that environmental signals, in which students can develop responses through looking around or recalling past experiences, often restricted their ability to develop responses that went beyond functional fixity. The study results suggested that educators should extend their curriculum beyond activities and requirements that have a clearly defined solution or predetermined answer, and instead encourage students to use their problem-solving skills to tackle multiple solutions in real-world situations.

In this study it was determined that only 9.7% of the questions examined in the social studies textbook are considered higher level questions, while 90.6% are considered lower level questions focused on rote memory rather than encouraging problem solving, judgement, and critical thinking skills. Students were exposed to consistent requirements for lower level thinking. In the book *Democracy and Education*, Dewey (1916) wrote that he believed teaching methods are cohesive in the degree to which they focus on producing good thought habits. While we may talk of the process of thought without fault, the important thing is that learning is the method of an educational experience. The essential elements of teaching methods are identical to the essential elements of reflection. First, the student must have a genuine situation of experience where the student is engaged in a continuous activity that he/she is interested in. Secondly, that a genuine problem develops within this situation as a stimulus for thought. Thirdly, the student possesses the information and makes the observations necessary to deal with it. Next, suggested solutions occur making the students responsible for developing in an orderly way. Lastly, the student must have the opportunity to test ideas by application, in an effort to make the meaning clear and to discover validity for themselves. For example, Paul and Elder (2007), provided an

example of students being prompted to seek a logical conclusion when asked about who they would hold responsible for what happened to the Jewish people in during the Nazi Holocaust of the late 1930s and 1940s. This type of Socratic questioning provides a precursor to the current classroom discussion about the students' view on the Middle East. By engaging students in this type of critical thinking process, the teacher is linking up the issue with the Holocaust during World War II, and, ultimately, teaching how to solve one injustice without committing another.

The results of this case study reveal that the questions that are being promoted in the 10th grade social studies textbook, through the use to test and quizzes, fail to meet Dewey's criteria for critical thinking, as they do not align to the definition of higher order thinking skills as described in research literature. Instead, the questions found on tests and quizzes found in the 10th grade social studies textbook promote functional fixedness, or inflexible thinking that prohibits students from developing alternative solutions to solving a problem. Students are essentially training to think "one way." The results of this study reveal the extensive use of multiple-choice format questions throughout the tests and quizzes. Multiple choice format questions contain the correct answer and can develop a closed mindset as students are not required to think beyond rote memorization.

Recommendations for Practice

The findings of this study raise awareness for superintendents, district curriculum coordinators, school administrators, and teachers to be proficient is understanding and utilizing the Hess Cognitive Rigor Matrix, Webb's Depth of Knowledge, and Bloom's Taxonomy during the textbook selection process to ensure the promotion and development of higher order thinking skills are present in the classroom. The results of this study suggest that there is a disconnect between what the textbook companies are promoting and the current demands placed on our

students for the 21st century. The ideal recommendation would be the formation of a textbook adoption committee composed of various curriculum coordinators, principals, department supervisors, subject area high school teachers, elementary teachers, Title 1 teachers, English as a second language teachers, and special education teachers to research and recommend textbooks that align with the school's vision of promoting extended and higher order thinking. Once textbooks of interest have been agreed upon, a meeting should be arranged for the textbook representatives to visit the district for a presentation regarding the textbook series offering and resources. During these sessions, free sample textbooks are typically distributed to the district personnel for further review in an effort to make a final decision. The committee should then review the sample textbooks utilizing the Hess Cognitive Rigor Matrix, to evaluate a random sampling of questions to ensure that the questions are aligned with the framework's definition of higher order thinking skills.

When textbooks are adopted at the district level without input from textbook adoption committees composed of administrators, supervisors, or teachers, it is recommended that committees be formed at the local level in an effort to evaluate the newly adopted series utilizing the Hess Cognitive Rigor Matrix. Building principals and key faculty members should schedule evaluation meetings utilizing the Hess Cognitive Rigor Matrix, district curriculum and NJSLS to determine what modifications if any, are needed to promote higher order thinking skills within the classroom. It is further recommended that building principals meet with their key faculty committee members to introduce and familiarize the faculty with the Hess Cognitive Rigor Matrix and the coding process.

Once a textbook has been selected for adoption, relevant and effective professional development must be made available to faculty members. In order to improve student learning,

professional development needs to demonstrate a meaningful connection between teacher professional development, teaching practices and student outcomes. As an important strategy to support the complex skills students need to be prepared for further education and work in the 21st century, educators and policymakers are increasingly looking to build upon teacher professional learning. Teachers must employ more sophisticated forms of teaching to develop mastery of challenging content, problem-solving, effective communication, and collaboration and self-direction. Effective and consistent professional development is essential for teachers to learn and refine the pedagogies necessary to teach these skills. Effective professional development for this case study is defined as structured professional learning which results in changes in teacher practices and improvements in student learning outcomes.

According to Darling-Hammond, Hyler, and Gardner (2017), effective professional development should incorporate most, if not all, of the following elements. Professional development must focus on teaching strategies associated with specific content of the curriculum that supports teacher learning in the context of the teacher's classroom. Professional development should consist of active learning that productively engages teachers in the design and testing of teaching strategies, providing them with the opportunity to engage in the same learning style they plan for their students. These professional development uses authentic objects, immersive games, and other techniques to provide technical learning that is deeply embedded and strongly contextualized. This methodology shifts away from traditional, lecture-based learning styles and experiences and has no direct link to the classrooms and students of teachers.

High-quality professional development offers teachers with the opportunity to share insights and engage in their learning, often in job-embedded contexts. By working together,

teachers can create communities that change the culture and instruction of their entire grade level, department, school, and/or district in a positive way. The use of appropriate implementation templates as instructional models and teaching modeling provides teachers with a clear understanding of what best practices look and feel like. Teachers can display templates that include lesson plans, unit plans, student study research, peer teacher evaluations, and teaching video or written events. Guidance and expert support must be embedded into professional training, including the exchange of know-how on topics and evidence-based strategies specifically focusing on the individual needs of students. Research shows that high-quality technical development also allows teachers time to think about, receive input, and improve their approach by encouraging reflection and seeking input. Feedback and meditation both help teachers work thoughtfully toward concrete professional goals. Effective professional development provides teachers with sufficient time to learn, practice, implement and reflect on new strategies to facilitate change in their practice. Professional learning communities are another example of a professional development model incorporating several of these effective elements and supporting learning gains for students. This collaborative and job-embedded professional development can be a source of effectiveness and trust for teachers and can lead to widespread improvements within and beyond the school level.

It is further recommended that strong administrative support, guidance and buy-in are present to ensure that higher order questions are being promoted in the classroom either through the use of instructional resources or classroom discussions. When implementing new instructional resources such as textbooks, administrators must be on board to support the implementation process. During classroom observations administrators must assume the role of a coach and not an evaluator. By administrators assuming the role of coach they are able to

validate growth and effectiveness. Teachers are then more likely to repeat good teaching practices when administrators specifically point out strategic instruction promoting critical thinking, “I love the way you wrote that anchor chart with your students.” Administrative feedback must be specifically targeted to the teaching skills that can be applied over and over again. By doing this, the administrator is teaching teachers to be more strategic by delivering instruction instead of providing their students with assignments.

Recommendation for Policy

In an effort to ensure that teachers are properly prepared to implement any new textbook a district policy should be created to safeguard against teaching from the text if it is determined that lower-level thinking is being promoted within the text. Selecting a textbook and its resources is only the first step. In order for the resource to be used with fidelity a policy should be put into place outlining the steps for implementation. The district policy should include a three-year implementation plan that includes the process of requiring a pilot program before full implementation to avoid making a large financial investment. Effective pilot programs should help to crystallize the program’s strengths and weaknesses, while also allowing time to improve resources by supplementing for areas of weakness. A successful pilot program has the potential to reveal 70% to 80% effectiveness and 20% of what needs modification. Once the textbook has been successfully piloted and approved for purchase by the Board of Education the implementation process can begin.

During the first year of implementation, an evaluation of all resources should take place using the district-approved Hess Cognitive Rigor Matrix. Year one of the implementation process should focus on organized and effective qualitative and quantitative feedback. During the second year of the implementation process, decisions must be made on how the district will

effectively launch this new initiative, fleshing out what types of professional development are needed and when the professional development will take place. The district policy should also include a way to track effectiveness by using actual data. In the third and final stage of implementation, the textbook can now be launched across the entire district, with the strengths identified and the weaknesses addressed. Using the same data tools during the pilot program, the teacher can now begin to use benchmark or summative assessments that are aligned to the NJSLS, accompanied by pretesting and post-testing, to determine where students were before the instruction and where they are currently. Collecting data is a crucial piece to this process and must take place through a thorough and organized method. Opportunities for reflection must take place regularly as a way to continually evaluate student progress.

Recommendations for Further Research

Further studies should also examine the types of questions being promoted in other social studies textbooks used in public school classrooms. These studies may reveal different results that could help further the understanding of the capabilities of textbooks and textbook companies to promote higher order thinking skill development. This study examined questions aligned with grade 10 standards. Further studies can be conducted to analyze and categorize test questions from other grade levels, to better understand the overall textbook series and how it affects students in other grade levels. The examination of other grade levels could possibly identify similarities and differences in the frequency and percentage of higher-order questions being asked of students by comparing the questions being asked at different grade levels. Further studies of social studies textbooks from various textbook series would help to determine which, if any, textbook series promote critical thinking through the use of higher order thinking questions.

This study focused on determining the frequency and percentage of higher-order questions being promoted in a 10th grade social studies textbook. The study did not examine the effects of these textbooks on other aspects such as the, student achievement on the New Jersey Student Learning Assessment (NJSLA), Scholastic Aptitude Test (SAT), Preliminary Scholastic Aptitude Test (PSAT), and Advanced Placement exams (AP). Further studies to explore the use of test and quizzes from social studies textbooks and their impact on student achievement such as, NJSLA, SAT, PSAT, and AP scores, could provide valuable data regarding the textbook's overall effectiveness. Further studies can be conducted on the effectiveness of the use of tests and quizzes from social studies textbooks in low socioeconomic areas, Abbott districts, or failing districts as it correlates to student achievement could provide critical information when developing future policies in schools that are failing. There is also a need for future research focused on examining textbook companies to determine how great of an influence they have on education policy. Textbook companies sell educational products and services that influence schools and student lives. Additionally, further research focusing on evaluating vertical alignment specifically targeting how each grade level builds naturally from one to the next as well as a balance of content, teaching/demonstration approaches and literacy standards would be extremely beneficial for educators. Reviewing literature regarding the stages of cognitive development and of how much higher-level thinking can be expected at various chronological ages to guide curriculum development at the local level. Additionally, further research, such as a qualitative study on the perceptions of teachers about the influence of Hess Cognitive Rigor Matrix, Webb's Depth of Knowledge, or other thinking frameworks on curriculum development at the local level in districts that have used frameworks to inform curriculum, would add to our understanding of children's intellectual growth.

REFERENCES

Anderson, B., & Johnson, W. (1966). Two Kinds of Set in Problem Solving. *Psychological Reports, 19*(3), 851–858. https://doi.org/10.2466/pr0.1966.19.3.851

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*.

Armstrong, P. (2017). *Blooms taxonomy.* Retrieved from https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Applied Educational Systems, Inc. (2010). *Retrieved from https://www.aeseducation.com/*

Bengtsson, Mariette. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open. 2*. 10.1016/j.npls.2016.01.001.

Berelson, B. (1952). *Content analysis in communication research*. New York, NY, US: Free Press.

Bieri, J., & Blacker, E. (1956). The generality of cognitive complexity in the perception of people and inkblots. *The Journal of Abnormal and Social Psychology, 53*(1), 112–117. https://doi.org/10.1037/h0049167

Bickmore, Kathy & Parker, Christina. (2014). Constructive Conflict Talk in Classrooms: Divergent Approaches to Addressing Divergent Perspectives. *Theory & Research in Social Education*. 42. 291-335. 10.1080/00933104.2014.901199.

Bissell, A. N., & Lemons, P. P. (2006). A new method for assessing critical thinking in the classroom. *BioScience*, 56(1), 66–72. Retrieved from http://bioscience.oxfordjournals.org/content/56/1/66.full.pdf

Bloom, B. S. (Ed.). Engelhart, M. D., Furst, E. J., Hill, & W. H., Krathwohl, D. R. (1956). *Taxonomy of educational objectives, Handbook I: The cognitive domain*. New York, NY: David McKay.

Bogdan, Robert & Biklen, Sari. (2007). *Qualitative research for education: An introduction to theories and methods.*

Boss, Suzi. (2019). *It's 2019. Why Do 21st Century Skills Still Matter?* http://www.edsurge.com/news/2019-01-22-its-2019-so-why-do-21st-century-skills-still-matter.

Brookhart, S. M. (2010). *How to assess higher-order thinking skills in your classroom.* Alexandria, VA: Association for Supervision and Curriculum Development.

Byun, Hyunjung & Lee, Jung & Cerreto, Frank. (2014*). Relative effects of three questioning strategies in ill-structured, small group problem solving*. Instructional Science. 42. 10.1007/s11251-013-9278-1.

Cambridge Assessment International Education. (2019). https://blog.cambridgeinternational.org/*reflections-on-the-100th-year-anniversary-of-john-deweys-democracy-and- education.*

Chen, Mei-Hui. (2016). ISSN 1799-2591 Theory and Practice in Language Studies, Vol. 6, No. 2, pp. 217-226, February 2016 DOI: http://dx.doi.org/10.17507/tpls.0602.01

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Thomas Oaks, CA: Sage.

Charlotte Danielson, Charlotte. (2011). *Enhancing Professional Practice: A Framework for Teaching*. Overview of the Framework for Teaching

Darling-Hammond, Linda, Hyler, Maria E., & Garndner, Madelyn (2017). *Effective teacher professional development.* Learning Policy Institute. https://learningpolicyinstitute.org/

Deal, T. E., & Peterson, K. D. (1999). *Shaping school culture: The heart of leadership*. San Francisco, CA: Jossey-Bass.

Dewey, J. (1902). *The child and the curriculum.* Chicago, IL: University of Chicago Press.

Dewey, J. (1916). *Democracy and education: an introduction to the philosophy of education*. New York, NY: Macmillan.

Dewey, J. (1910). *How we think.* Boston, D.C. Health & Co.

Dolmans, D., Graves, W., Wolfhagen, I. & Vleuten, C. (2005). *Problem-based learning: future challenges for educational practice and research.* Volume 39, Issue 7. https://doi.org/10.1111/j.1365-2929.2005.02205.x

Downe-Wamboldt, B. (1992). Content Analysis: Method, Applications, and Issues. *Health Care for Women International*, 13, 313-321.

Duncker, K. (1945). On problem-solving (L. S. Lees, Trans.). *Psychological Monographs*, *58*(5), i–113. https://doi.org/10.1037/h0093599

Fischer, Christopher; Bol, Linda; Pribesh, Shana. *American Secondary Education.* Spring 2011, Vol. 39 Issue 2, p5-26. 22p. 4 Charts., Database

Francis, E. (2016). *What exactly is depth of knowledge.* Retrieved from http://edge.ascd.org/blogpost/what-exactly-is-depth-of-knowledge-hint-its-not-a-wheel

Francis, Erik. (2016). *Now That's a Good Question! How to Promote Cognitive Rigor Through Classroom Questioning*.

Freiberg, H. J. & Stein, T.A. (1999). *School Climate: Measuring, improving and sustaining healthy learning environments*. New York: Routledge Falmer.

Fullan, Michael & Watson, Nancy & Improvement, International. (2000). *School-Based Management: Reconceptualizing to Improve Learning Outcomes.* http://lst-iiep.iiep-unesco.org/cgi-bin/wwwi32.exe/[in=epidoc1.in]/?t2000=013542/(100). 11. 10.1076/sesi.11.4.453.3561.

Glaser, E. M. (1941). *An experiment in the development of critical thinking*. New York City, NY: Teachers College, Columbia University.

Glăveanu, V. P. (2013). Rewriting the Language of Creativity: The Five A's Framework. *Review of General Psychology, 17*(1), 69–81. https://doi.org/10.1037/a0029528

Godfrey, E.B., Grayman, J.K. Teaching Citizens: The Role of Open Classroom Climate in Fostering Critical Consciousness Among Youth. *J Youth Adolescence* 43**,** 1801–1817 (2014). https://doi.org/10.1007/s10964-013-0084-5

Gomboc-Turyan, J.L. (2012). *Impact of Learning Theory Methods on Undergraduate Retention and Application of Software in a Studio Setting*.

Gormley, William.T. Jr. (2017). *The Critical Advantage: Developing Critical Thinking in Schools*. Harvard Education Press.

Harjunen, E. (2012). *Patterns of control over the teaching-studying-learning process and classrooms as complex dynamic environments: a theoretical framework*. European Journal of Teacher Education, 35(2). 139-161

Hartle, R. T., Baviskar, S., & Smith, R. (2012). A field guide to constructivism in the college science classroom: Four essential criteria and a guide to their usage. Bioscene: *Journal of College Biology Teaching*, 38(2), 31–35. Retrieved from http://files.eric.ed.gov/fulltext/EJ1002158.pdf

Hattie, J. (October 2002). *"What are the attributes of excellent teachers*?" Presentation at the New Zealand Council for Educational Research Annual Conference, University of Auckland.

Hess, K. K., Jones, B. S., Carlock, D., & Walkup, J. R. (2009a). *Cognitive rigor: Blending the strengths of Bloom's taxonomy and Webb's depth of knowledge to enhance classroom level processes*. Retrieved from https://files.eric.ed.gov/fulltext/ED517804.pd

Hess, K. K., Carlock, D., Jones, B., & Walkup, J. R. (2009b). *What exactly do "fewer, clearer, and higher standards" really look like in the classroom? Using a cognitive rigor matrix to analyze curriculum, plan lessons, and implement assessments*. Retrieved from http://schools.nyc.gov/NR/rdonlyres/D106125F-FFF0-420E-86D9-254761638C6F/0/HessArticle.pdf.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288.

Jirka, J. and Hambleton, Ronald. K. (2005). *Cognitive Complexity Levels for the MCAS Assessments* University of Massachusetts Amherst. Center for Educational Assessment MCAS Validity Report No. 10. (CEA-566). Amherst, MA: University of Massachusetts, Center for Educational Assessment.

Kiss,T., Jiaotong, X. & Wang, A. (2017). Investigating Teacher Questions Within the Framework of Knowledge Building Pedagogy. *Journal of International Social Studies, 7*(1), 55-69.

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Thousand Oaks, CA: Sage.

Larson, Lotta & Miller, Teresa. (2011). *21st Century Skills: Prepare Students for the Future*. Kappa Delta Pi Record. 47. 121-123. 10.1080/00228958.2011.10516575.

Lennon, S. (2017). Questioning for Controversial and Critical Thinking Dialogues in the Social Studies Classroom. *Issues in Teachers Education, 26*(1), 3-17.

Lewis, A., & Smith, D. (1993). Defining Higher Order Thinking. Theory into Practice, 32, 131-137. https://doi.org/10.1080/00405849309543588

Lord, T. R., & Baviskar, S. (2007). Moving students from information recitation to information understanding: Exploiting Bloom's Taxonomy in creating science questions. *Journal of*

College Science Teaching, 36(5), 40–44. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.462.9527&rep=rep1&type=pdf Loyens, S. M., Jones, S. H., Mikk

MacNeil, Angus. J, Prater, Doris. L. & Busch, Steve. (2009). The effects of school culture and climate on student achievement, International Journal of Leadership in Education, 12:1, 73-84, DOI: 10.1080/13603120701576241

Marra, R. M., Jonassen, D. H., Palmer, B., & Luft, S. (2014). Why Problem-Based Learning Works: Theoretical Foundations. *Journal on Excellence in College Teaching*, 221–238. Retrieved from http://s3.amazonaws.com/static.pseupdate.mior.ca/media/links/Why_Problem_based_Learning_Works.pdf

Mayring, P. (2000). Qualitative content analysis. Forum: Qualitative Social Research, p. 40.

Meier, R. L., Williams, M. R. and Humphreys, M. A. (2000), Refocusing Our Efforts: Assessing Non-Technical Competency Gaps. *Journal of Engineering Education*, 89: 377-385. doi:10.1002/j.2168-9830.2000.tb00539.x

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Meyer, E., Abrami, P. C., Wade, C. A., Asian, O., & Deault, L. (2010). Improving literacy and metacognition with electronic portfolios: Teaching and learning with ePEARL. Computers & Education, 55(1), 84–91. doi:10.1016/j.compedu.2009.12.005

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook.* Thousand Oaks, CA: Sage.

Nappi, J. (2016). *The Importance of Questioning in Developing Critical Thinking Skills*. The Delta Kappa Gamma Bulletin: International Journal for Professional Educators, 30-40.

National Research Council. (2001). Pellegrino, J., Chudowsky, N., & Glaser, R. (Eds.) Knowing what students know: *The science and design of educational assessment.* Washington, D.C.: Academy Press.

Niebling, B. C. (2012b). *Using Webb's alignment model to measure intended-enacted curriculum alignment: A brief treatment*. Des Moines, IA: Iowa Department of Education.

New Jersey Department of Education (2017). *The New Jersey Student Learning Standards for Social Studies* Retrieved from https://www.state.nj.us/education/cccs/2014/ss/standards.pdf

Newmann, Fred. M. (1990). Higher order thinking in teaching social studies: a rationale for the assessment of classroom thoughtfulness, *Journal of Curriculum Studies*, 22:1, 41-56, DOI: 10.1080/0022027900220103

Newmann, Fred. M. (1991). *Promoting Higher Order Thinking in Social Studies: Overview of a Study of 16 High Schools Departments.* Theory & Research in Social Education, v.19 Issue 11 p. 324-340 10 Jul. 2012.

Patton, M. Q. (2002). Two Decades of Developments in Qualitative Inquiry: A Personal, Experiential Perspective. *Qualitative Social Work, 1*(3), 261–283. https://doi.org/10.1177/1473325002001003636

Paul, R. W., & Elder, L. (2007). The Thinker's Guide To The Art of Socratic Questioning: Based on Critical Thinking Concepts and Tools. Dillon Beach, CA: *Foundation for Critical Thinking Press.*

Peterson, D. S., & Taylor, B. M. (2012). *Using higher order questioning to accelerate students' growth in reading*. The Reading Teacher, 65, 295-304. doi:10.1002/TRTR.01045

Resnick, Laura B. (2010). *Nested Systems for the Thinking Curriculum*. Volume, 39 issue: 3, page(s): 183-197 https://doi.org/10.3102/0013189X1036467

Rowe Budd, Mary. (1974). *Reflections on wait-time: Some methodological questions*. Journal of Research in Research of Science Teaching. Volume 11, Issue 3. Retrieved from https://doi.org/10.1002/tea.3660110309

Runco, M.A. and Chand, I. (1995) Cognition and Creativity. Educational Psychology Review, 7, 243-267. http://dx.doi.org/10.1007/BF02213373

Sato, E., Lagunoff, R., & Worth, P. (2011*). SMARTER Balanced Assessment Consortium Common Core State Standards analysis: Eligible content for the summative assessment*. (Final Report). Retrieved from eric.gov?id=ED536959

Schulz, H. & FitzPatrick, B. (2016). *Teachers' understandings of critical and higher order thinking and what this means for their teaching and assessments*. Alberta Journal of Educational Research. 62. 61-86

Scriven, M. and Paul, R. (1987). Defining Critical Thinking. 8Th Annual International Conference on Critical Thinking and Education Reform. http://www.criticalthinking.org/pages/defining-critical-thinking/766

Sforza, D. (2014*). Inclusion of cognitive complexity: A content analysis of New Jersey's current and past intended curriculum*. Seton Hall University Dissertations and Theses (ETDs). 2020.h9p://scholarship.shu.edu/dissertations/2020

Smith, Page & Hoy, Wayne. (2007). *Academic optimism and student achievement in urban elementary schools*. Journal of Educational Administration. 45. 556-568. 10.1108/09578230710778196.

Snow, C.P. (1959). *The Two Cultures*. THE REDE LECTURE. Cambridge University Press.

Splan, R. K., Porr, C. S., & Broyles, T. W. (2011). Undergraduate research in agriculture: Constructivism and the scholarship discovery. *Journal of Agricultural Education*, 52(4), 56–64. doi: 10.5032/jae.2011.04056

Stake, Robert. (2005). *Qualitative Case Studies. The Sage handbook of qualitative research.*

Sydoruk, Paige D., "An Analysis of the Higher Order Thinking Requirements of a Grade 8 Online-Based English Language Arts Skills Program" (2018). *Seton Hall University Dissertations and Theses (ETDs)*. 2495. https://scholarship.shu.edu/dissertations/249

Tienken, C. H., Goldberg, S., & DiRocco, D. (2010). Questioning the questions. *Education Digest: Essential Readings Condensed for Quick Review*, 75(9), 28–32.

Tienken, Christopher H. (2017). *Defying Standardization Creating Curriculum for an Uncertain Future*. Rowan & Littlefield, Lanham, Maryland.

Tienken, C. H., & Orlich, D. C. (2013). *The school reform landscape: Fraud, myth and lies*. Lanham, MD: Rowman & Littlefield Education.

Thomas, A., and Thorne, G. (2009). *How to Increase Higher Order Thinking*. Metarie, LA: Center for Development and Learning. Retrieved Dec. 7, 2009, from http://www.cdl.org/resource-library/articles/HOT.php?type=subject&id=18

Tofade, T., Elsner, J., & Hanies, S. (2013). *Best Practices for Effective Use of Questions as a Teaching Tool*. American Journal of Pharmaceutical Education, 77(7) Article 155, 1-9.

P. David Pearson, Sheila W. Valencia & Karen Wixson (2014) *Complicating the World of Reading Assessment: Toward Better Assessments for Better Teaching*, *Theory Into Practice*, 53:3, 236-246, DOI: 10.1080/00405841.2014.916958

Wagner, Tony. (2008). *The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need-And What We Can Do About It.*

Walker, C. O., Greene, B. A., & Mansell, R. A. (2006). I*dentification with Academics, Intrinsic/Extrinsic Motivation, and Self-Efficacy as Predictors of Cognitive Engagement.* Learning and Individual Differences, 16, 1-12. https://doi.org/10.1016/j.lindif.2005.06.00

Wang, J.-R., & Chen, S.-F. (2014). Exploring mediating effect of metacognitive awareness on comprehension of science texts through structural equation modeling analysis. *Journal of Research in Science Teaching, 51*(2), 175–191. doi: 10.1002/tea.21131

Webb, N. (1997). *Research monograph number 6: Criteria for alignment of expectations and assessments on mathematics and science education*. Washington, D.C.: CCSSO.

Webb, N., Alt, M., Ely, R., & Vesperman, B. (2005). *Web Alignment Tool (WAT) training manual*. Wisconsin Center for Educational Research, *1*(1) 1–177.

Webb, N.L. (2005). *Web Alignment Tool. Training Manual*. Wisconsin Center for Education Research.

Webb, N. L. (2008a). *Alignment analysis of extended reading standards and assessments*. (Final report). Madison, WI: Department of Public Instruction.

Weiler, A. (2005). Information-seeking behavior in generation Y students: Motivation, critical thinking, and l earning theory. *The journal of academic librarianship*, *31*(1), 46-53.

Weiner, B. (2005). Motivation from an Attributional Perspective and the Social Psychology of Perceived Competence. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (p. 73–84). Guilford Publications.

Wijnia, L., Loyens, S. M., & Derous, E. (2011). Investigating effects of problem-based versus lecture-based learning environments on student motivation. *Contemporary Educational Psychology, 36*(2), 101–113. doi:10.1016/j.cedpsych.2010.11.003

Wolcott, H. F. (1992). Posturing in qualitative inquiry. In M. D. LeCompte, W.L. Millroy & J. Preissle (Eds.), *The handbook of qualitative research in education* (pp.3-52). New York: Academic Press.

Wu, K. (1993). Classroom Interaction and Teacher Questions Revisited. *RELC Journal, 24*(2), 49–68. https://doi.org/10.1177/003368829302400203

Xu, Jun. (2011). The Application of Critical Thinking in Teaching English Reading. *Theory and Practice in Language Studies,* Vol. 1, No. 2, pp. 136-141, ACADEMY PUBLISHER doi:10.4304/tpls.1.2.136-141

Yang,Y., Newby,T., & Bill, R. (2005). Using Socratic questioning to promote critical thinking skills through asynchronous discussion forums in distance learning environments. *The American Journal of Distance Education, 19*(3), 163-181.

Yin, Robert, K. (2008). *Case Study Research and Applications: Design and Methods*. Thousand Oaks, CA: Sage Publications. (p.18).

Zohar, Anat & Barzilai, Sarit. (2013) A review of research on metacognition in science education: current and future directions, *Studies in Science Education*, 49:2, 121-169, DOI: 10.1080/03057267.2013.847261