


2017

A Study of Student Attitudes and Dispositions toward the Use of the Inquiry Method in Teaching Eighth-Grade Social Studies

Michael George Bolling

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A Study of Student Attitudes and Dispositions toward the Use of the Inquiry Method in
Teaching Eighth-Grade Social Studies

By
Michael G. Bolling

A Dissertation Submitted to the
Gardner-Webb University School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Gardner-Webb University
2017

Approval Page

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Acknowledgements

The author of this research would like to extend his deepest thanks to the professors at Gardner-Webb University and to the members of my doctoral cohort. You encouraged me to think more deeply about education than I ever thought I could. I would like to thank my dissertation committee chairman, Dr. Jim Palermo, for his constant support and advice throughout the process. I would also like to thank the rest of my dissertation committee, Dr. Jennifer Morrison and Dr. Montrie Belton for taking the time to read and respond with much needed insight.

I would like to especially thank Research Specialist Karen Price and Technical Specialist Wanda Gates, without whom this dissertation would not have been completed. My sincere thanks to the administration, faculty, staff, and students at my school, whose constant encouragement and assistance sustained me on a daily basis in this endeavor. I am honored to call you colleagues and friends.

Finally, this dissertation is dedicated to my late father, Michael G. Bolling Sr., who passed away unexpectedly during this process. He always encouraged me and had faith in me when I lacked faith in myself. My deepest thanks to my mother Linda and my brother Scott, whose prayers and thoughts encouraged me every day. Thanks to my fiancé Gale and her children, Grant and Lauren, who showed love and patience and provided support when I needed it most. Lastly, I want to thank my daughter Jessica for her understanding and unconditional love when dad was busy researching and writing. This dissertation is also dedicated to her with love.

Abstract

A Study of Student Attitudes and Dispositions toward the Use of the Inquiry Method in Teaching Eighth-Grade Social Studies. Bolling, Michael G., 2017: Dissertation, Gardner-Webb University, Critical Thinking/Dispositions/Inquiry/Historical Thinking

Despite a recent emphasis on instruction that utilizes higher level critical thinking skills in middle schools, too many history teachers rely primarily on rote memorization due to state standards that place an emphasis on teaching to a multiple choice standardized test. The difficulty of having to teach copious amounts of information is that it can give rise to the problem of coverage. Teachers feel they must cover massive amounts of material so their students will do well on the standardized test at the end of the school year. This leaves little time for engaging the students in higher level critical thinking instruction. In addition, in an effort to cover the standards, teachers rely on traditional methods of instruction that bore the students and cause negative attitudes toward social studies classes.

A study was conducted at a southeastern middle school. The students were given a pretest and posttest of the CM3II+ measuring student dispositions toward critical thinking. A pretest and a posttest of a researcher-created survey measuring student dispositions toward their social studies classes were also given. Between the pre and posttests, a 12-week course of inquiry was inserted into the normal course of study. In addition, the study sought to determine if there was a correlation between dispositions toward critical thinking and dispositions toward social studies classes.

The purpose of this study was to determine what affect a 12-week course of inquiry would have on eighth-grade student dispositions toward critical thinking and their history classes and whether there was a correlation between the two.

While the quantitative research did not support the researcher's anticipated outcomes, it did reinforce previous studies that found that strengthening dispositions takes a substantial amount of time. In addition, the qualitative research showed that student dispositions toward their social studies class were strengthened while students were actively engaged with the material and practicing historical thinking. This study builds on previous studies and its results warrant future investigation.

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Chapter 1: Introduction

Statement of the Problem

Despite a recent emphasis on instruction that utilizes higher level critical thinking skills in middle schools, too many history teachers rely primarily on rote memorization due to state standards that place an emphasis on teaching to a multiple choice standardized test (Cutler, 2014b; Eamon, 2006; Edmonds, Hull, Janik, & Rylance, 2005; Kelly & VanSledright, 2001; Sample, 2011; Savich, 2008). Marzano (2003) found that a typical k-12 school system's standards contain 3,093 benchmarks. Marzano estimated that 9,042 hours of instructional time are available to cover these, yet it is also estimated that 15,465 hours of instructional time would be needed to cover the benchmarks. According to Martin and Wineburg (2008), 48 states and the District of Columbia have established academic standards that address academic achievement in history. Document lengths vary in size. Some state standards contain as little as three (Wisconsin), five (Connecticut), and 11 pages (Montana). The problem lies with those states that contain large amounts of information such as Virginia (580 pages), Nevada (376), and Mississippi (301). Nearly half of the states use these documents in order to inform state assessments of history and social studies (Martin & Wineburg, 2008).

The difficulty of having to teach copious amounts of information is that it can give rise to the problem of coverage. Teachers feel they must cover massive amounts of material so their students will do well on the standardized test at the end of the school year (Doolittle, Hicks, & Ewing, 2005; Harris, Smith, & Harris, 2011; Hicks, Carroll, Doolittle, Lee, & Oliver, 2004; King, Newmann, & Carmichael, 2009; Martin & Wineburg, 2008; Nosich, 2005; Stoskopf, 2001). Sample (2011) explained that enduring understandings or what we want students to deeply understand about a course of study

can become lost by the need to cover substantial amounts of material. Traditional methods of teaching history may solve the problem of coverage but do not encourage students to think beyond knowledge level, causing negative attitudes among students toward history classes and inhibiting their dispositions toward critical thinking (Cutler, 2014b; Doolittle et al., 2005; Harris et al., 2011; Kelly & VanSledright, 2001; King et al., 2009; Martin & Wineburg, 2008; Stoskopf, 2001). Dispositions, as defined by Leader and Middleton (2004), are predilections, tendencies, or attitudes toward critical thinking as opposed to ability.

Purpose of the Study

The purpose of this study was to discover what affect a course of inquiry will have on eighth-grade student dispositions toward critical thinking and dispositions toward their history classes. The purpose of the study rests upon three research questions.

1. Is there a difference in eighth-grade student dispositions toward critical thinking after exposure to inquiry method teaching?
2. Is there a difference in eighth-grade student dispositions toward their social studies classes after exposure to inquiry method teaching?
3. Is there a correlation between dispositions toward critical thinking and dispositions or attitudes toward the students' social studies class?

A sample group of 50 eighth-grade students received direct instruction consisting of textbook reading and related activities, note taking, and lecture. In addition to these traditional methods of social studies instruction, the students engaged in inquiry-based lessons over a 12-week period.

Lazar (2011) and Lesh (2011) described the inquiry method of instruction as using independent and group research as a means to solve an historical problem or

answer an historical question. Lazar identified two competing tasks that history teachers must perform: equipping students with a degree of cultural literacy while at the same time ensuring that students gain the skills and knowledge necessary to be critical thinkers. Lazar concluded that the best model available to perform these competing tasks is the inquiry model. Lazar then identified the elements of the inquiry model as carefully crafting questions, student engagement in examining the evidence, moving on to more nuanced questions, navigating myths with the inquiry approach, identifying helpful resources, and preparing students to be critical thinkers.

This method of instruction is also encouraged by the Stanford History Education Group (2006), which offers lessons that draw upon familiar, real-life situations to help students understand historical thinking and prepare them to engage in inquiry using primary and secondary sources. According to the Stanford History Education Group, their lessons “engage students in historical inquiry. Each lesson revolves around a central historical question and features sets of primary documents designed for groups of students with diverse reading skills and abilities” (para. 1). Stanford History Education Group maintains a website that provides inquiry lessons for American and world history called “Reading Like a Historian.” These lessons are utilized for the inquiry instruction component of this study.

Critical thinking dispositions were measured using the California Measure of Mental Motivation (Giancarlo, Blohm, & Urdan, 2004) developed to measure dispositions among elementary and secondary level students. At the conclusion of the study, it will be determined whether frequent use of inquiry lessons, in addition to direct instruction, can improve student attitudes toward social studies class. Can it help diminish student reliance upon having the answers supplied to them for the purpose of

memorization and instead increase their dispositions toward critical thinking?

Background and Significance of the Problem

In a study measuring elementary and high school student dispositions toward social studies, Schug, Todd, and Beery (1982) found that students were mostly ambivalent toward social studies, emphasizing the idea that social studies classes were neither unique nor enjoyable. In addition, students cited a lack of variety of instructional methods and a need for more independent projects. Since that study, according to Zhao and Hoge (2005), similar studies have found that many students find the instruction of history as boring and useless with students preferring other subjects and having negative attitudes or dispositions toward social studies.

In an interview, Sam Wineburg cited a national survey which found that when 1,500 Americans were asked to pick one word or phrase to describe their elementary or high school history classes, “boring” was the most frequent answer. Wineburg attributed this negative disposition toward history classes to “bland textbooks stuffed with dry facts that dominate instruction in today’s high schools” (Trei, 2004, “Boring Classes,” para. 2). Reliance on textbooks and other traditional methods of instruction can be attributed to teacher attempts to cover material. According to Doolittle et al. (2005), “covering material is often the result of teachers feeling pressured to prepare students for year-end assessments” (para. 3). The pressure of covering the standards is exacerbated by the large amount of material, leaving little time for any type of in-depth examination of any particular topic (Stoskopf, 2001). Coverage-oriented survey courses, prevalent in public schools, that do not encourage students to do and think give rise to tedium (Calder, 2006).

In 1956, Benjamin S. Bloom (1984) published one of the first systematic classifications of thinking, which identified three domains of educational activity. The

first, known as the Cognitive Domain, involved the development of intellectual skill and included a multi-tiered taxonomy of six educational goals including knowledge, comprehension, application, analysis, synthesis, and evaluation. The taxonomy required achievement of the prior skill or ability before the next and more complex one could be achieved (Forehand, 2005). According to Tankersley (2005),

Bloom's Taxonomy is widely taught in teacher preparation courses yet many teachers seldom challenge students beyond the lowest two levels of comprehension, and most 21st century jobs require employees to use the four highest levels of thinking—application, analysis, synthesis, and evaluation—this is unacceptable in today's instructional programs. We must expect students to operate routinely at the higher levels of thinking. (p. 148)

The lack of challenging instruction that encourages students to think beyond knowledge and comprehension levels has implications for the future. Many students graduating from our public schools lack the ability to think critically upon entering college and/or the work force (Achieve Inc., 2005; Arum & Roksa, 2011; Toland, 2011;

Wagner, 2008). Wagner (2008) revealed that only about one third of U.S. high school students graduate ready for college, and the rates are lower for poor and minority students. Furthermore, 40% of all students who enter college must take remedial courses. In addition, 65% of college professors report that what is taught in high school does not prepare students for college. Wagner explained that the reason for this is the tests that students take in high school for accountability purposes only measure knowledge-level ability and are primarily multiple-choice questions that rarely ask students to explain their reasoning or apply their knowledge. Wagner also cited a recent work-readiness survey of

more than 400 employers in which less than a quarter reported that their new employees with 4-year college degrees had “excellent” basic knowledge and applied skills. Wagner made the argument that it is increasingly difficult for the United States to lead in the global economy when many students are graduating from high school and college unprepared for the working world.

Of Wagner’s (2008) list of seven survival skills, the first of these are critical thinking and problem solving. To meet the challenge of teaching critical thinking and problem-solving skills, public schools have renewed their efforts to implement higher level thinking instruction. The calls for implementation of standards that measure higher level thinking skills have led many to encourage the nationwide acceptance of the Common Core standards. These standards are designed to be robust and relevant to the real world and reflect the knowledge and skills that young people need for success in college and careers (Common Core State Standards Initiative, 2012).

Despite some renewed efforts to implement higher level thinking skills in our public schools, Kohn (2000) believed that standardized testing continues to be utilized in our public schools at a rate that is unprecedented in history, despite the fact that standardized tests tend to measure the temporary acquisition of facts and skills. This includes the skill of test taking itself, more than genuine understanding. Contrary to a more genuine understanding, students have been largely conditioned up to the present to expect instruction of history as a more traditional process of relying solely on rote memorization of facts and not in a more heuristic fashion (Fischer, 2010; Waring, 2012).

Lesh (2011), a high school teacher and department chair in Reistertown, Maryland, wrote of his initial experience teaching history:

Despite my best effort, the initial experience teaching history to high school

students was frustrating. What I found in the classroom was that my students generally did not share the same feelings about the utility of the past, nor did they sense a connection between the course and their goals for the future. For my students in 1993, just as for “Natalie” (a current student) in 2009, history was an exercise in memorization and something akin to a rite of passage necessary to proceed to the next grade. The order of the presidents, the names of state capitals and treaties- these and other facts constituted the whole of history for my students. “Just tell me what I need to know for the test” was a refrain I heard frequently during my first year of teaching.” (pp. 8-9)

For students to improve dispositions toward critical thinking in social studies, they must become “doers” of history (Burenheide, 2007; Eamon, 2006; Hicks et al., 2004; Martin & Wineburg, 2008). Teachers must balance their instructional methods of “sit and get” and rote memorization with historiography, the active exploration of historical topics and issues (Bass & Good, 2004; Ciciora, 2009; Kek, Yih, & Huijser, 2011). According to Edmonds et al. (2005), “history has traditionally been taught not as a practice in which students engage but rather as a collection of data they master” (p. 4). Eamon (2006) stated, “using primary and secondary sources in the teaching of history transcends the rote learning of facts and figures” (p. 1).

Realizing that traditional methods of instruction that rely almost exclusively on rote memorization have had a negative effect on student attitudes and dispositions toward history classes, more interactive, student-centered teaching methods are needed (Maloy & LaRoche, 2010). According to Lesh (2011), the traditional methods of rote memorization and direct instruction bore students and give them a negative attitude toward history class, yet the students are comfortable with this method because it largely provides them

with the answers. Brenda Trofanenko, a professor of curriculum and instruction in the College of Education at the University of Illinois, stated,

American's historical apathy is also an indictment of the way history is taught in grades K-12. Teaching history by rote, having students memorize historical dates and then testing them on how well they can regurgitate that data on a test, is a pedagogical method guaranteed to get students to tune out and add to our collective civic and historical cluelessness. I agree that there should be a base knowledge that students need to know about their country and their community affiliations, but its relevance lies not just in knowing historical fact but being able to see what can be gleaned from historical inquiry, including cause and effect, progress and decline, and historical significance. (Ciciora, 2009, pp. 1-2)

The school included in this study is a medium sized, southeastern middle school. It serves a diverse student body with a variety of ability and socioeconomic levels. This school was recently visited by a Making Middle Grades Work team that issued a report that found that the school in question needs to do more to implement higher level thinking skills overall and in its history classes.

The Team visited the school for 2 days and conducted interviews and classroom observations. They found that the school needed to improve classroom practices that engage students in their learning; and upon future visits, they want to see more high-level teaching strategies being employed (Southern Regional Education Board, 2012). Of 76 observations conducted during the visit, only 13 lessons or 17% observed displayed high rigor (Southern Regional Education Board, 2012). According to P. Costello, (personal communication, March 16, 2011), Making Middle Grades Work defined a lesson displaying high rigor as "those that make use of higher level thinking skills." The same

report stated that of 14 observational visits made to social studies classes at the school included in this study, four classes were observed being engaged in low rigor lessons. Seven were engaged in lessons labeled as medium rigor, and only three were observed engaging in lessons considered to be of high rigor (Southern Regional Education Board, 2012). In addition, teachers were told prior to the team visit to plan lessons that encourage high rigor or higher order thinking skills. One might conclude that had teachers not been told this, the number would have been significantly lower, with the conclusion being that there needs to be more rigorous lessons on a daily basis. Based on this study (Southern Regional Education Board, 2012), higher rigor lessons, those that engage students in higher level thinking skills, need to be implemented in social studies classes at this school.

Definition of Terms

Rigor. Refers to lessons that are considered “high rigor” and require the use of higher level thinking skills.

Inquiry method. An instructional method that requires the instructor to create a question that students answer by pointing to factual evidence that the students uncover through individual and cooperative research.

Critical thinking. Critical thinking is defined as the ability to solve problems and think at a higher level such as the application, analysis, synthesis, and evaluation levels of Bloom’s taxonomy.

Direct instruction. Direct instruction is the teaching of an objective using lecture or demonstration of the material rather than exploratory methods such as the inquiry method. For the purpose of this study, direct instruction will consist of traditional methods of instruction such as lecture, textbook work, and note taking.

Dispositions. Dispositions are defined as “predilections, tendencies or attitudes” toward critical thinking or social studies classes” (Leader & Middleton, 2004, p. 1).

Summary

Due to state standards that emphasize multiple choice standardized tests, too many history teachers rely on teaching methods that utilize rote memorization as opposed to higher level critical thinking skills (Cutler, 2014b; Eamon, 2006; Edmonds et al., 2005; Kelly & VanSledright, 2001; Leader & Middleton, 2004; Sample, 2011; Savich, 2008). In some cases, states have too many standards or the standards contain massive amounts of information, compelling teachers to try and cover the material to ensure that their students score well on standardized tests (Carlson, 2011; Doolittle et al., 2005; Harris et al., 2011; King et al., 2009; Martin & Wineburg, 2008; Nosich, 2005; Stoskopf, 2001). This type of instruction does little to contribute to the student’s “enduring understandings” or what we want them to know (Sample, 2011).

The dispositions of middle school students toward social studies classes range from ambivalent to negative due to boredom (Schug et al., 1982; Zhao & Hoge, 2005). Culpability for these negative dispositions lies with coverage due to standardized testing (Doolittle et al., 2005). Coverage and traditional methods of instruction such as rote memorization also contribute to negative dispositions toward critical thinking (Leader & Middleton, 2004). Furthermore, the lack of encouragement of students to think beyond the knowledge and comprehension levels of Bloom’s taxonomy (Bloom, 1984) have led to an inability of public school students to think critically upon entering college and/or the work force (Wagner, 2008).

Martin and Wineburg (2008) stressed that for students to improve their dispositions toward history and critical thinking, they must become historians in the

classroom. One method that encourages students to become historians by having them answer historical questions and solve historical problems is the inquiry method (Lazar, 2011).

Chapter 2: Literature Review

Introduction

Prior to exploring student dispositions toward critical thinking in the classroom and student dispositions toward social studies classes, a brief investigation of the nature of critical thinking will first be undertaken. This element of the review of the literature will focus on a definition of critical thinking, including a brief history and discussion of the components of critical thinking: ability and dispositions.

The broader discussion of critical thinking having been narrowed to dispositions exclusively; the difference between critical thinking ability and dispositions will be clearly delineated. The research question asking whether or not critical thinking dispositions can be improved by utilizing a specific instructional method will be reviewed. Though there seems to be a gap in the literature regarding whether or not middle school students specifically, and middle school history students in particular, can improve their dispositions to think critically, there are a myriad of studies to be analyzed researching elementary, high school, and college students. These studies provide valuable insight into answering this research question.

In order to analyze the second research question that asks whether or not student attitudes toward social studies classes can be improved using the instructional method of inquiry, one must investigate the predominant, traditional instructional methods widely used in history classes that affect these attitudes. In addition to instructional methods, some of the inherent challenges teachers face due to the structure of the public educational system such as comprehensive standardized assessments and coverage must be investigated and understood.

The last section of the review of the literature will conjoin the two research

questions by focusing on the need for students to investigate history or to engage in historiography and become historians in the classroom. In order to investigate history, students were encouraged to engage in higher order thinking. Before they can do this however, they must have a disposition to do so (Tishman, Jay, & Perkins, 1992). The instructional method for use in this study was the method of historical inquiry. It is this methodology that was used and tested to discern what the effect would be on student dispositions toward critical thinking and their social studies classes. The review of the literature concludes with an investigation of the challenges of using an inquiry-based approach when teaching history.

Critical Thinking

It is beneficial for this study to investigate the history and beliefs of modern proponents of critical thinking. Modern advocates of critical thinking often do not agree on a universal definition of critical thinking. Many have taken the beliefs of earlier scholars and expanded upon their previous ideas. By investigating these myriad of definitions, we can gain a clear picture of the characteristics of critical thinking.

The modern critical thinking movement in the United States began with the psychologist, philosopher, and educator John Dewey. Dewey (2012) placed an emphasis on problem solving and defined the essence of thinking as maintaining a state of doubt and carrying on systematic and protracted inquiry. Dewey further referred to critical thinking as “reflective thought” and defined “reflective thinking” as

active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends includes a conscious and voluntary effort to establish belief upon a firm basis of evidence and rationality. (p. 5)

Dewey believed that reflective thinking is initiated when one is faced with a problem and how to solve it. In order to solve the problem, the learner takes an active role in asking his/her own questions and drawing his/her own conclusions during the process, while the instructor takes a more passive role. In addition, Dewey believed that there were three attitudes necessary to engage in critical thought: open-mindedness, responsibility, and whole-heartedness. According to Fisher (2001), Dewey's definition of critical thinking is "essentially and active process – one in which you think things through for yourself, raise questions yourself, find relevant information yourself, etc. rather than learning in a largely passive way from someone else" (p. 2). Maloy and LaRoche (2010) believed that this would seem to contradict the modern methods of teaching in some U.S. history classes where questions and answers are often teacher driven.

Glaser (1941), the co-author of one of the most widely utilized critical thinking tests, the Watson-Glaser Critical Thinking Appraisal, defined critical thinking as (a) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience, (b) knowledge of the methods of logical inquiry and reasoning, and (c) some skill in applying those methods. In building upon Dewey's definition, Glaser introduced attitudes and dispositions. Glaser recognized that critical thinking requires certain skills, but the thinker must be disposed to use these skills. Thus, Glaser recognized that critical thinking consists of skills and dispositions. Following this line of thinking, the logical assumption can be made that critical thinking skills can be useless without first possessing an attitude or disposition to use the skills.

One of the most prolific writers concerning critical thinking for the past 40 years and the co-author of the Cornell Critical Thinking Test, Robert Ennis, gives us one of the most widely utilized definitions of critical thinking. Ennis (1991) defined critical

thinking as “reasonable, reflective thinking that is focused on deciding what to believe or do” (Critical Thinking and Thinking section, para. 1). The emphasis on critical thinking as being “reasonable” and “reflective” is in agreement with the former explanations, but Ennis (1991) spoke of making a decision what to believe or do. In addition, Ennis (1991) also emphasized the importance of dispositions as well as skills by providing a set of 14 specific taxonomies of critical thinking dispositions. He included being clear about the intended meaning of what is said, written or communicated; determining and maintaining focus on the conclusion or question; taking the total situation into account; seeking and offering reasons; trying to be well informed; looking for alternatives; seeking as much precision as the situation requires; trying to be reflectively aware of one’s own basic beliefs; being open-minded, seriously considering other points of view and being willing to consider changing one’s own position; withholding judgment when the evidence and reasons are sufficient to do so; using one’s own critical thinking abilities; and being careful and taking into account the thoughts and feelings of other people (Ennis, 1991).

Richard Paul (1992), Director of Research and Professional Development at the Center for Critical Thinking and Chair of the National Council for Excellence in Critical Thinking, felt that critical thinking can be defined in a number of ways consistent with one another, therefore he does not place too much weight on any one definition; however, given this reality, critical thing can be defined as “thinking about your thinking while you’re thinking in order to make your thinking better” (p. 4). Two things about this metacognitive definition are crucial: “(1) critical thinking is not just thinking but thinking which entails self-improvement; and (2) this improvement comes from skill in using standards by which one appropriately assesses thinking” (Paul, 1992, p. 4). The premise of Paul’s definition is that thinking can be made perfect through the use of intellectual

standards. Without these intellectual standards, thinking cannot be measured to ensure whether or not it is disciplined and well thought out. Paul also believed that critical thinking requires more than higher order skills and abilities. His concept of critical thinking includes attitudes, dispositions, passions, or traits of mind.

Facione (1990) was one of 46 nationally recognized thinkers who participated in a 2-year qualitative study commissioned by the American Philosophical Association. He published the findings of the study, commonly known as the “Delphi Report.” The Delphi Report defined critical thinking as “purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (Facione, 1990, p. 3). According to Facione, critical thinking is essential as a tool of inquiry: “It combines developing critical thinking skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society” (p. 3). Like Paul (1992), the use of the terms “purposeful” and “self-regulatory” allude to the idea of critical thinking as being a metacognitive process. In addition to a definition of critical thinking, Facione and Facione (1992) created a 75-item survey using a six point Likert scale that ranges from “strongly agree” to strongly disagree” to measure critical thinking dispositions. In their California Critical Thinking Dispositions Inventory (CCTDI), Facione and Facione (1992) identified seven critical thinking subdispositions that include truth seeking, open-mindedness, analyticity, systematicity, critical thinking, self-confidence, inquisitiveness, and maturity.

Ennis (1991), Facione (1990), and Paul (1992) all interpreted critical thinking as an active process that rejects the passive learning to which so many children in today’s

schools are primarily subjected. In Facione and Facione's (1992) description, they include specific skills that mirror the higher levels of Bloom's taxonomy. According to Facione and Facione's (1992) description, it is not enough to merely reach a conclusion; but in order for the process to be considered critical thinking, one must be able to explain the methods and evidence that lead students to a certain conclusion. Once again, as a metacognitive process, students must understand the process of their own thinking.

Halpern (1998) cited Russell's definition that critical thinking is "the use of those cognitive skills and strategies that increase the probability of a desired outcome" (p. 8). Halpern (1998) used critical thinking to describe thinking that is "purposeful, reasoned and goal-directed and involves solving problems, formulating inferences, calculating likelihoods, and making decisions" (p. 8). Like Ennis (1991), Facione (1990), and Paul (1992), Halpern (2014) believed critical thinking is a metacognitive process, but she expounded on the idea that when engaged in critical thinking, certain cognitive processes should be used for different types of information. In addition to her definition of critical thinking, Halpern (2014) proposed that critical thinkers exhibit the following dispositions or attitudes: "willingness to plan, flexibility, persistence and the willingness to self-correct, admit errors and change your mind when the evidence changes, being mindful and consensus-seeking" (p. 20). Though these educators, researchers, and philosophers have differently worded definitions and explanations of critical thinking, their various conclusions converge to help better delineate the shared characteristics of critical thinking. Critical thinking contains two components: skills and dispositions (Dewey, 2012; Ennis, 1991; Facione & Facione, 1992; Glaser, 1941; Halpern, 2014; Paul, 1992). Critical thinking contains the element of problem solving (Dewey, 2012; Glaser, 1941; Halpern, 2014). Critical thinking is metacognitive in that the thinker must think about

his/her thinking, leading to improvement in an individual's ability to think critically (Facione, 1990; Facione & Facione, 1992; Facione, Facione, & Giancarlo, 1997; Halpern, 2014; Paul, 1992). Critical thinking involves inquiry (Dewey, 2012; Ennis, 1991; Facione, 1990; Facione & Facione, 1992; Facione et al., 1997; Glaser, 1941; Halpern, 2014; Paul, 1992). Lastly, critical thinking emphasizes higher level thinking skills (Dewey, 2012; Ennis, 1991; Facione, 1990; Facione & Facione, 1992; Facione et al., 1997; Glaser, 1941; Halpern, 2014; Paul, 1992). All of these researchers emphasize self-improvement through critical thinking that leads naturally to improvement for the greater society (Dewey, 2012; Ennis, 1991; Facione, 1990; Facione & Facione, 1992; Glaser, 1941; Halpern, 2014; Paul, 1992).

The Importance of Critical Thinking

Though it is difficult to construct an official, universal definition of what critical thinking is, based on the work of proponents we can determine that critical thinking is a metacognitive process where one is disposed to use higher level thinking skills in order to solve a problem or engage in inquiry to answer a question. Having made this determination, we must ask ourselves whether critical thinking is important. What makes critical thinking beneficial and what evidence is there that critical thinking skills are needed in today's schools and in the broader society?

Specifically, some research (Achieve Inc., 2005) suggests that our public school students are graduating unprepared for college or a career. A study conducted by Peter D. Hart Research Associates/Public Opinion Strategies for Achieve Inc. (2005), an independent, nonpartisan, nonprofit education reform organization dedicated to working with states to raise academic standards and graduation requirements, improve assessments, and strengthen accountability, interviewed 1,487 public high school

graduates from the classes of 2002, 2003, and 2004. The total sample comprised 861 students currently enrolled in 2- and 4-year colleges and 626 high school graduates not currently enrolled in college, including 267 who had been enrolled in college but have withdrawn. The total sample includes oversamples for a total of 303 African-Americans, 287 Hispanics, and 353 current college students who have taken a remedial course. From December 10-16, 2004, they also interviewed 400 employers who make personnel decisions including owners, CEOs, presidents, and human resources professionals. From December 13, 2004 to January 5, 2005, they interviewed 300 instructors who teach first-year students at 2- and 4-year colleges. Achieve Inc. found that 40% of the nation's high school graduates say they are inadequately prepared to deal with the demands of employment and postsecondary education. The college instructors were the most critical of public high schools. They estimated that over 40% of college students are not adequately prepared by the education they received in high school to meet the overall expectations of college. Conspicuously, with regard to critical thinking, large majorities of instructors were dissatisfied with the job public schools are doing in preparing students for college when it comes to their ability to read and comprehend complex materials (70%). Majorities of instructors were dissatisfied with their students' preparation in a number of other areas including their ability to think analytically (66%), their work and study habits (60%), their ability to do research (59%), and applying what they learn to solve problems (55%). Large proportions of employers who were asked similar questions regarding their satisfaction with the job that high school is doing preparing graduates for a number of skills needed in the work force said they were dissatisfied with graduates' abilities to read and understand complicated materials (41%), to think analytically (42%), and to apply what they learn to solve real-world problems (39%;

Achieve Inc., 2005). All of the skills emphasized by the instructors and employers require the ability to think at a higher level by engaging in critical thinking (Achieve Inc., 2005).

A second study of more than 2,300 undergraduate college students from 24 schools that is highly critical of the ability of colleges and universities to challenge students academically with more rigorous instruction found that 45% of the students “did not demonstrate any significant improvement in learning during the first two years of college” (Arum & Roska, 2011, para. 2; Toland, 2011, para. 1). Released by The Social Science Research Council, the book *Academically Adrift: Limited Learning on College Campuses* and the accompanying report found that colleges are not challenging students academically (Arum & Roksa, 2011). Thirty-six percent of students demonstrated “no significant gains in critical thinking, complex reasoning and written communication over all four years of college” (Arum & Roksa, 2011, para. 2; Toland, 2011, para. 2). Half of the students did not take a course requiring 20 pages of writing during their prior semester. “One-third did not take a single course requiring even 40 pages of reading per week” (Toland, 2011, para. 2). Based on these studies (Arum & Roksa, 2011; Toland, 2011), college instructors feel they are unable to go forward with higher level instruction and instead must spend valuable time teaching remedial skills not mastered on the secondary level of high school. Furthermore, many students in the study reported having to take intermediate courses in college (Arum & Roksa, 2011; Toland, 2011).

These factors illustrate a need for more rigor in our public schools and colleges. Blackburn and Williamson (2009) defined rigor as “creating an environment in which each student is expected to learn at high levels, each student is supported so that he or she can learn at high levels and each student demonstrates learning at high levels” (para. 3).

Defining rigor in this fashion, by placing an emphasis on learning at high levels, is synonymous with higher order or critical thinking. This lack of rigor or higher order thinking instruction in our public schools and colleges leads to a lack of preparedness in college and the work force (Achieve Inc., 2005; Arum & Roksa, 2011; Toland, 2011).

Success in the 21st century workforce requires proficiency in 21st century skills. Twenty-first century skills can be defined as problem solving and interpersonal communication skills or acquiring information from others. These skills are more in demand today than basic skill sets (Levy & Murnane, 2005; Saavedra & Opfer, 2012; Walser, 2008). Despite this, Wagner (2008) stated that we have education backwards by emphasizing an information-based curriculum that places an emphasis on acquiring information first and then acquiring skills second.

As an ancillary explanation for the importance of teaching critical thinking in our public schools, colleges, and universities, Halpern (1998) believed that it is the sheer amount of information at the disposal of anyone with computer access. The problem is what is to be done with this considerable amount of information. According to Halpern (1998),

information has to be selected, interpreted, digested, evaluated, learned and applied or it is of no more use on a computer screen than it is on a library shelf. If people cannot think intelligently about the myriad issues that confront them, then they are in danger of having all the answers but still not knowing what the answers mean. The dual abilities of knowing how to learn and knowing how to think clearly about the rapidly proliferating information that they will be required to deal with will provide the best education for citizens in the 21st century. (p. 450)

The Teaching of Critical Thinking

Is it possible to teach critical thinking? If so, how should this instruction be given? If critical thinking cannot be taught, then it is an inherent skill that we are or are not born with and any discussion concerning whether we should teach higher level thinking skills becomes pointless. A variety of theories have been forwarded and studies conducted involving whether or not certain types of instruction can increase a student's ability to think critically and what form that instruction should take. These studies contain varying opinions and results.

According to Ennis (1989), there are four approaches to fostering thinking and understanding in students. These approaches include the stand-alone approach or general approach, the infusion or embedding approach, the immersion approach, and the mixed approach. The stand-alone approach advocates teaching a set of thinking skills separate from subject matter content. The primary goal of this explicit method is to improve student abilities to process information. Advocates of the stand-alone approach include Nickerson, Perkins, and Smith (1985) and Kruse and Presseisen (1987). The infusion approach imbeds thinking skills into the regular curriculum. Proponents of this approach include Resnick (1987), Dewey and Bento (2009), and Davies (2006). With the immersion approach, the principles of good thinking are not made explicit (Ennis, 1989). Advocates of this approach include Warren, Memory, and Bollinger (2004) and McPeck (1981). The mixed approach to fostering critical thinking consists of an amalgamation of the stand-alone approach and the infusion approach or the emersion approaches. The students are engaged in subject-specific critical thinking instruction while at the same time receiving instruction in the general principals of critical thinking (Abrami et al., 2008; Ennis, 1989). Advocates of this approach, which uses explicit and implicit

instruction of critical thinking, are Facione (1990); Kennedy, Fisher, and Ennis (1991); and Paul (1992).

Critical Thinking Dispositions

Can students be taught to think critically if they do not first possess the disposition to do so? Dispositions are attitudes and an attitude can be defined as “a disposition or readiness for some kind of action” (Gagne, 1977, p. 236). Critical thinking has a dispositional or attitudinal component known as attitudes, dispositions, passions, and traits of mind that a learner possesses (Paul & Nosich, 1992). This readiness to think (or not) or dispositional dimension of critical thought has gained in importance recently, yet the idea of critical thinking dispositions is not a new one.

Dewey (2012) recognized the importance of dispositions by referring to a student’s habits, attitudes, and interests and went so far as to claim that these traits were being overlooked yet were more important than skills and knowledge. Liu (2006) defined dispositions toward critical thinking as “tendencies that motivate one to practice and apply critical thinking skills” (p. 1). These attitudes are in essence a second component of thinking critically and very well may be the most important. Mathews and Lowe (2011) propagated the viewpoint that it is the sensitivity and inclination to question and seek dissenting views that are at the core of a disposition for critical thinking. Despite the various, specific definitions of dispositions, almost all scholars in the field of critical thinking agree that it would be useless to learn critical thinking skills and then fail to use those skills because one does not have a disposition or inclination to do so (Center for Comprehensive School Reform, 2005; Giancarlo et al., 2004; Liu, 2006; Tishman et al., 1992; Walker, 2005).

In summary, a person with good critical thinking skills uses those skills when

faced with a problem to solve, ideas to evaluate, or decisions to make (Athman, Monroe, & Monroe, 2006; Facione et al., 1997). The skills are worthless if left unused, and a focus on critical thinking should include dispositions and not cognitive skills exclusively (Giancarlo & Facione, 2001; Giancarlo et al., 2004; Liu, 2006; Tishman et al., 1992).

Elements of Critical Thinking Disposition

Philosophers, educators, and researchers agree on the importance of the component of critical thinking known as attitudes or dispositions; however, they offer a myriad of traits or characteristics that a critical thinker possesses as varied as the definition of critical thinking.

Marzano, Pickering, and McTighe (1993) identified dispositions as “habits of mind” (p. 3) in their five Dimensions of Learning. These are habits used by critical, creative, and self-regulated thinkers. The fifth dimension is labeled “Productive Habits of Mind” (Marzano et al., 1993, p. 3). Marzano et al. made the claim that perhaps this is the most important dimension because developing mental habits that will enable individuals to learn on their own, whatever they want or need to know at any point in their lives, is probably the most important educational goal. These “habits of mind” include being clear and seeking clarity, being open-minded, restraining impulsivity, being aware of your own thinking, evaluating the effectiveness of your actions, pushing the limits of your knowledge and abilities, and engaging intensely in tasks even when answers or solutions are not immediately apparent (Marzano et al., 1993).

Gagne (1977) defined attitudes as dispositions or readiness for some kind of action. Given this description, attitudes and dispositions are closely related if not identical. Fazio (1990) submitted that attitudes are either spontaneous or deliberate. Spontaneous attitudes are activated by memory by an attitude-inducing object, while

deliberate processing takes place through careful examination and analysis. This Mode Model identifies opportunity and motivation as the catalyst that will determine which of the two processes will occur. Fazio (1995) identified five important attitude-strengthening elements including “direct experience, sensory experience, emotional reaction, freely chosen behavior, and attitude rehearsal” (p. 247).

Perkins, Jay, and Tishman (1993) outlined three elements that comprise dispositions: “abilities refer to the skills and capabilities needed to perform the behavior, sensitivities refers to an alertness to appropriate occasions for engaging in the behavior and inclinations that refer to the tendency to behave in a certain way” (p. 4). In addition to the elements that comprise dispositions, the authors included seven specific thinking dispositions. The first disposition is to be broad and adventurous. This disposition refers to “being open-minded and able to identify close-minded thinking” (Perkins et al., 1993, p. 7). The disposition toward sustained intellectual curiosity includes “a zeal for inquiry, identifying problems, being alert for anomalies, close observation and being able to formulate questions” (Perkins et al., 1993, p. 7). The disposition to clarify and seek understanding refers to “a desire for clear understanding, seeking clarification and connections and a need for focus” (Perkins et al., 1993, p.7). The disposition to be planful and strategic pertains to “goal setting and the execution of plans” (Perkins et al., 1993, p. 8). The disposition to be intellectually careful applies to “being precise, organized and thorough, alert to errors and inaccuracies” (Perkins et al., 1993, p. 8). The disposition to seek and evaluate reasons touches upon the “ability to question given information, demand justification and being alert to the need for evidence” (Perkins et al., 1993, p. 8). Last, the disposition be metacognitive refers to “being aware of and able to monitor one’s own thinking and be reflective” (Perkins et al., 1993, p. 8). Ritchart (2014)

closely equated dispositions with emotions. It is his submission that if we are serious about promoting critical thinking skills in the classroom, we cannot ignore the role of emotions. Ritchart believed that our initial emotional reactions must be recognized and controlled to develop dispositions, attitudes, and habits. Ritchart quoted Goleman (1995), stating that the “first read of a situation is always centered on emotions, feelings and attitudes” (p. 1). Emotions lay the groundwork for the thinking that is soon to take place (Goleman, 1995); and it is this initial emotional reaction that prohibits students from using the critical thinking skills that the students have been taught and, as a result, more attention needs to be paid to the development of thinking attitudes and dispositions (Ritchart, 2014). Goleman further explained that in order to harness the power of emotion, we must first recognize the immediate emotional response and be aware that this is simply an emotion-based first response. Though the initial emotional reaction may not be negative or unproductive, it still warrants consideration and review. Ritchart stated, “we must develop an awareness of opportunities for effective thinking” (p. 4). This requires us to develop sensitivity to occasions to think critically (Perkins et al., 1993). Perkins et al. believed that when we are sensitive to occasions for thinking, we see beyond our emotional reaction to a situation. Ritchart explained that there are two components to sensitivity: the first is an awareness of when and where the thinking around a situation is becoming slovenly or narrow. The second component is to identify what kind of thinking might be useful and more productive in a situation. The last approach in harnessing the power of emotion, according to Ritchart, is to act your way into a new way of thinking. This means that we must develop certain habits or patterns of action that will incline us toward certain behaviors in the future.

Tishman and Andrade (1999) emphasized that dispositions are both positive and

negative and both contribute to overall thinking performance. On the positive side, one might be disposed toward fair and open-minded intellectual behavior; and on the negative side, one might be disposed toward biased and one-sided thinking. Most of the work being done in the field focuses on the productive thinking dispositions, those dispositions that contribute to and characterize high-level critical and creative thought (Tishman & Andrade, 1999). There must be an emphasis placed on negative dispositions as well, because it is the negative attitudes and dispositions that can hinder productive high-level critical thinking (Giancarlo et al., 2004; Liu, 2006; Tishman et al., 1992). In order to ensure that students are thinking critically in the classroom, one must investigate whether or not dispositions can be improved or made more positive.

Improving Critical Thinking Dispositions Using Specific Instructional Methods

The first research question to be investigated in this study was whether or not there is a difference in eighth-grade student dispositions toward critical thinking after exposure to inquiry method teaching. There is a gap in the literature concerning inquiry specifically; however, there are studies that investigate the question of whether or not specific instructional methods can improve dispositions. These often include an inquiry component.

A longitudinal study of five classes of community college students conducted by Bers, McGowan, and Rubin (1996) sought to investigate the extent to which disposition and academic success are related. The CCTDI was administered pre and posttest. The study experienced mixed results regarding whether or not academic success and dispositions were related. Based on this study, it is still unclear; however, findings suggested that some critical thinking dispositions could be improved using particular instructional methods. The study was inconsistent, with some subscale scores showing

improvement or slight improvement while other subscale scores showed no improvement or regression. The data suggest that the degree to which the students change their disposition to think critically over a semester is minimal; however, there was quite a bit of movement illustrated by both gains and losses in different subscales. These mixed, inconsistent findings could be explained by the time factor. The authors question the extent to which dispositional changes of any sort are reasonable over a period as short as 16 weeks. Little attention was given to exactly what types of classroom instruction were given during the course of the study. There is a reference to “analytical inquiry” but no details as to what exactly that inquiry entails. In summary, the results of this study are inconclusive as to whether a certain instructional strategy can improve dispositions; however, it does suggest that certain dispositions are more easily improved than others.

A study conducted by Durr, Lahart, and Maas (1999) investigated the efficacy of utilizing an explicit instructional approach to help develop and improve critical thinking skills in high school math and social studies students. Data were collected from parent, teacher, and student surveys and the Cornell Critical Thinking Test Level X. This test was given as a pretest and was used to illustrate the student’s lack of critical thinking skills. Various interventions were used, including an inquiry component where the students were engaged in problem solving and interpreting points of view for 5 months prior to giving the Cornell Critical Thinking Test Level X as a posttest to measure student improvement. Results of the study were mixed. The interventions implemented appeared to have little effect on critical thinking skills; however, there was some improvement shown in student dispositions to think critically. Improvement was observed in student perseverance when faced with challenging problems. Students were observed increasing their time reading and asking for clarification of directions before

starting a task. Other evidence of improved dispositions included an increased willingness to listen to other points of view and an increase in willingness to take risks and ask questions, in some cases higher level questions (Durr et al., 1999). The quantitative data showed no gains in the ability to think critically; however, the qualitative data showed that student dispositions to think critically benefitted from the interventions utilized in this study.

Giancarlo and Facione (2001) conducted a longitudinal, 4-year study of undergraduate students at a private, Catholic, comprehensive university to measure attitudes and dispositions. Like Bers et al. (1996), the authors utilized a pretest/posttest CCTDI as a measure of student attitudes or dispositions. The study did not utilize a particular instructional method but sought to find out whether exposure to college-level instruction increases critical thinking dispositions. The results of the CCTDI scales were varied; however, overall, the study found that across all seven CCTDI scales as well as the overall scale, means for student scores were consistent or higher in 1996 than they were in 1992. Evidence suggests that critical thinking dispositions were either sustained or increased in strength over a 4-year period of undergraduate education at the university.

Warren et al. (2004) conducted a study advocating an immersion approach to teaching the Vietnam War to high school and college students. In using the immersion approach, the authors placed a greater importance on richness of content knowledge and an atmosphere conducive to encouraging a positive attitude or disposition toward critical thinking. They supported using a variety of direct instructional methods such as traditional lectures, textbook and secondary readings, film or film excerpts, presentations by Vietnam War veterans, and examinations of internet sites. After the initial base knowledge had been disseminated, the students began the immersion instruction by using

more indirect methods of instruction such as critical reading, argument and discussion in groups, and writing of a paper. This approach contained an inquiry element in that the students explored questions raised by the Vietnam War. The authors believed that this approach best encourages student transfer of critical thinking to real-world settings by increasing the disposition to do so. The authors simply stated that they have used this method and it is effective. The authors presented observational evidence only; however, there is no empirical evidence in this study to reinforce its efficacy.

Leader and Middleton (2004) focused on the disposition of “sensitivity to occasion” (p. 2) and advocated ill-structured problems as a method of helping students identify occasions that call for thoughtful attention. Leader and Middleton asked the question, “How can middle school students learn to identify occasions that call for thoughtful attention?” (p. 2). They began with the similarities between dispositions and attitudes. The disposition to “seek and evaluate reasons” for example can be identified through that person’s behavior. A strong or well-developed disposition to seek and evaluate reasons is manifested in situations where seeking and evaluating reasons is appropriate. This cause-effect relationship between disposition and action points out the similarity between dispositions and attitudes.

Gagne (1977) defined an attitude as a “disposition or readiness for some kind of action” (p. 236). Attitudes are activated from memory by strength of association between an object, issue, or event and an individual’s evaluation of that object, issue, or event. According to Fazio (1990), judgment and actions stem from two types of processing modes, spontaneous or deliberative process. If there is low motivation to deliberate (spontaneous), preexisting attitudes are activated from memory and they are often biased and free from the processing effort required for critical thought. Leader and Middleton

(2004) identified this as the evidence that “sensitivity to occasion is the bottleneck to critical thinking” (p. 3).

Leader and Middleton (2004) contended that recognition of an occasion that calls for thoughtful attention may occur in one of two ways:

1. The student may not normally recognize an occasion that calls for critical thinking but on a particular occasion, the student is afforded the opportunity and may be motivated to deliberate over a situation. Upon examining the options, the student’s inclination and ability to make thoughtful choices come into play.
2. A student may have already acquired a strong attitude of critical thinking in certain situations. In such situations, this attitude will be spontaneously activated and the person will recognize the need for thoughtful attention. They will then most likely be inclined to act thoughtfully and carry out his/her intentions.

Leader and Middleton (2004) maintained that instructors and curriculum leaders can promote student sensitivity to occasions that call for critical thinking. They can do this by providing opportunities for student engagement in motivating and deliberative activities that entail identifying occasions for critical thinking. Students may develop good thinking dispositions that are strong and accessible. “In other words students might learn to detect occasions for critical thinking as a natural habit of mind” (Leader & Middleton, 2004, p. 4). Development of strong attitudes that are readily activated from memory when an individual encounters a situation associated with the attitude depends on several factors. Fazio (1995) identified five factors that are major determinants of attitude strength and accessibility from memory: (1) direct experience, (2) sensory

experience, (3) emotional reactions, (4) freely chosen behavior, and (5) attitude rehearsal. In order to facilitate the learning of sensitivity to critical thinking occasions, instructors should incorporate into motivating, problem-solving activities the attitude strengthening factors Fazio identified (Leader & Middleton, 2004).

Leader and Middleton (2004) advocated the solving of ill-structured problems as a way to incorporate these five factors Fazio identified. Ill-structured problems are the kinds of problems that are encountered in everyday practice (Jonassen, 1997). They are problems situated in the real world. They afford students opportunities to (a) directly experience occasions for critical thinking, (b) engage a number of senses in the richness of real-world problem situations, (c) react emotionally to those situations, (d) freely choose a path to solution, and (e) engage in a series of activities that provide repeated opportunities to rehearse critical thinking dispositions (Middleton, Lesh, & Heger, 2003).

Fifth- and sixth-grade students in nine states were given a questionnaire at the beginning and end of the school year during which they used at least three Jasper Adventures, spending approximately one week on each adventure. The Jasper Adventures immerse students in real-life issues and engage students in real-world problem solving. Ultimately, the authors concluded that through the use of ill-structured problems, teachers and instructional designers may promote positive changes in student thinking dispositions. Instruction that incorporates ill-structured problem solving also encourages students to invest emotionally and choose freely as they construct arguments and articulate a personal position on a problem.

Last, this type of instructional design promotes repeated expression of critical thinking dispositions through the give and take of considering possible alternatives and developing support for arguments (Leader & Middleton, 2004). Leader and Middleton

(2004) drew three broad conclusions at the end of the study:

1. Development of attitude strength takes time.
2. Students need to have a stake in their learning.
3. Multiple perspectives on problem solving are built into the design.

The authors used observation and questionnaires in this report but included no data in the form of a type of measure such as the CCTDI or the California Measure of Mental Motivation; however, the authors propagate the idea that dispositions can be improved and attitudes can be increased using ill-structured or real-world problems over time.

Noting that fine arts students actively engage in open-ended problem solving, critical inquiry, and reflection, Lampert (2006) conducted a study comparing differences among disciplines. This study was a replication of the Giancarlo and Facione's (2001) 4-year study. These researchers found differences among disciplines; however, due to small sample size, fine arts students were removed from the study.

As an art educator, Lampert (2006) conducted a similar study with a sample of art students. Unlike Giancarlo and Facione (2001), this study is not a longitudinal study. Instead, data were collected at one point in time. The two studies used the same instrument of measurement, the CCTDI. The CCTDI is discipline-neutral and does not measure critical thinking. It measures the disposition to use critical thinking ability.

The results upheld the earlier Giancarlo and Facione (2001) study that found that 4 years of undergraduate education increased the disposition to think critically. The Lampert (2006) study showed that juniors and seniors in the sample had a higher disposition to think critically than freshmen. This finding sustains Giancarlo and Facione's finding that time spent in college increases dispositions to think critically. The

Giancarlo and Facione study, which did not include fine arts students, showed significant differences between discipline clusters on several of the CCTDI subscales. The Lampert study, which included fine arts students, also showed significant differences among discipline groups on several CCTDI subscales. Fine arts students scored significantly higher than non-arts undergraduates on truth seeking, critical thinking maturity, and open-mindedness. This suggests that a visual arts curriculum and instruction may enhance critical thinking dispositions.

Two of the subscales arts students in the Lampert (2006) study scored significantly higher on, truth seeking and open-mindedness, are the subscales that humanities, letters, and languages students in the Giancarlo and Facione (2001) study scored higher on than all other discipline groups, indicating that there could be similarities in the critical thinking dispositions of fine arts students and humanities, letters, and languages students (Lampert, 2006). The Lampert study indicated that immersion in a discipline that requires constant trial and error problem solving, inquiry, discussion, and analysis may condition the mind to approach problems with the attitude or disposition that there are multiple solutions to complex problems. The implication for this study is that if arts students have a greater disposition toward critical thought than non-arts students due to more heuristic, problem-based methods of instruction, perhaps non-arts student dispositions could benefit from this type of instruction as well.

Ernst and Monroe (2006) focused on critical thinking skills, yet included findings concerning critical thinking dispositions in their study. The authors used the Cornell Critical Thinking Test Level X, a measure of critical thinking skills, to discover the effects of environment-based education on student critical thinking skills and dispositions. Observations by instructors and interviews with instructors were used to

gather qualitative data in addition to quantitative data. Results of this research suggest students who participated in environment-based programs were more skilled in critical thinking than their peers, including peers who were in traditional environmental science classes. The data further suggest that the ninth- and twelfth-grade students in environment-based programs had critical thinking skill levels that were comparable to or exceeded those of college students in several American universities. One year of environment-based education did not improve ninth-grade student dispositions toward critical thinking. This may be related to the duration of treatment; while ninth-grade students in the environment-based programs may have developed critical thinking skills, 1 year may not be enough time for them to develop a disposition to use these skills. Multiple years of environment-based education, however, may have improved student dispositions, as twelfth-grade students who participated in the environment-based programs were more disposed toward critical thinking than their peers (Ernst & Monroe, 2006). Though the authors emphasized an environmental-based curriculum/instruction, the study seemed to uphold two constants, that increasing student dispositions to think critically is an ongoing process that takes time and requires real-world, problem-solving activities that engage students and make them feel compelled to use their critical thinking skills.

The Liu (2006) study highlighted the reciprocity of critical thinking skills and dispositions. According to Liu,

having strong dispositions, one will apply critical thinking regularly and skillfully. Likewise, critical thinking is a path to achieve the goals of dispositions. Having a confidence gain from the improvements of critical thinking skills, one will continue to engage in thinking. Then, the more successful experiences in learning

and applying critical thinking skills, the higher level of dispositions can be developed. (p. 27)

In Liu's (2006) study, the independent variable was the instructional approach; the dependent variables were critical thinking skills and dispositions. Two instruments designed by the researcher were used to collect the data of critical thinking dispositions, including Dispositions Toward Critical Thinking Questionnaire and an observation checklist. The instrument for measuring critical thinking skills was also created by the researcher and used for pretesting and posttesting. Interviews were used to measure the interaction between critical thinking skills and dispositions. The study involved seventh-grade students with the experimental group receiving content emphasizing critical thinking skills and dispositions, and various instructional strategies were applied to explicitly teach critical thinking skills and dispositions. The control group received instruction in the regular science curriculum. The pretest/posttest provided the quantitative data, and direct observation provided the qualitative data.

Results of the study found that middle school students' critical thinking skills are likely to increase along with age. In addition, overall female students showed better critical thinking skills than males in each grade. In contrast to the results for critical thinking skills, the research indicated disposition scores are likely to decrease along with age. Older students scored lower on the disposition portion of the study than younger students, even though the difference was not statistically significant. Female and male disposition scores also had no statistically significant difference. Preliminary findings supported the idea that dispositions may not develop along with age. The study found that a correlation between critical thinking skills and dispositions was not statistically significant.

Liu (2006) gave two reasons why the disposition score could not effectively predict critical thinking skills scores. First, Liu found that some middle school students already had a tendency to think critically; however, they did not have strong critical thinking skills. They need more time and practice on improving thinking skills. Second, there was a gap between student self-assessment and real performance. Just one disposition score cannot fully reflect a student's disposition level. The experimental group had better improvement on critical thinking skills and dispositions than the control group after receiving critical thinking instruction within the science curriculum. Females in the control group also had a slight increase in critical thinking skills over males.

Burns (2009) conducted a study to find out whether science inquiry would have an effect on elementary students' critical thinking skills and dispositions with mixed results. The quantitative data showed no effect, while qualitative data showed evidence of improvement.

This mixed-methods study incorporated qualitative methods such as interviews and observations with the quantitative methods of pretest/posttest with nonequivalent treatment and comparison groups. The instruments used in the study were the New Jersey Test of Reasoning Skills to measure a wide variety of the students' critical thinking abilities and the California Measure of Mental Motivation to measure the students' critical thinking dispositions.

The quantitative data collected using the New Jersey Test of Reasoning Skills were inconclusive. Both groups' pre to posttest mean significantly increased; however, the comparison group's mean was higher, indicating there was no increase in critical thinking in the treatment group. The California Measure of Mental Motivation revealed that the posttest means between the treatment group and the comparison group had no

significant difference. The treatment group showed a significant difference on the creative problem-solving scale indicating that their exposure to the science inquiry kit did have an influence on their tendency to use their critical thinking skills to solve problems creatively. While the quantitative data did not yield results that indicate that the use of a science inquiry kit led to an increase in critical thinking skills and dispositions, the qualitative data did show positive results. Classroom observations showed students asking questions, making connections to other areas, analyzing data, reflecting on what they had learned, and then devising new questions and predictions based on this previous knowledge and applying their knowledge. Teachers in the treatment group felt that their students were making connections and asking more thought-provoking, insightful questions. In addition, the fact that the teachers in the treatment group were willing to change their classroom practices and use the science inquiry kit the next school year indicates that the kit had great influence on student critical thinking skills and dispositions (Burns, 2009).

Miri, Ben-Chaim, and Zoller (2007) illustrated that inquiry, real-world problem solving, and open-ended discussion can be effective in increasing critical thinking and critical thinking dispositions of high school students. This longitudinal study included both qualitative and quantitative methods of data collection including a pre/posttest experimental design over a 3-year period.

Results found that only two of 10 science and non-science teachers claimed to have utilized critical thinking strategies in their instruction. During the 3-year study, all students made gains to some extent in both critical thinking skills and dispositions. Purposely teaching for the promotion of higher order thinking skills does contribute to the development of critical thinking skills and disposition toward critical thinking. The

study showed that critical thinking capabilities might not be disciplinary dependent. When comparing high school science and non-science majors from traditional classes, no significant differences in critical thinking and critical thinking dispositions were found. Last, three teaching strategies were identified as promoting higher order thinking skills: dealing with real-world cases, open-ended classroom discussions, and fostering inquiry-oriented experiments.

Stupniski, Renaud, Daniels, Haynes, and Perry (2008) investigated the interrelation of critical thinking disposition, perceived academic control, and academic achievement. According to Perry (2003), perceived academic control refers to people's beliefs about their capacity to influence daily life events. This distinction between individuals' perceived capacity and their actual capacity results in people assuming they have more or less capacity to influence and predict events than they have in reality. (p. 314)

Perceived academic control plays an important role in college students' academic success (Perry, 2003). When students feel in control, their motivation and performance increase; conversely, when they do not feel in control, motivation and performance decrease (Perry, Hladkyj, Pekrun, & Chipperfield, 2005). Stupniski et al. contended that both perceived academic control and dispositions are valuable qualities for college students and that they may influence each other; thus, this study explored the reciprocal effects between critical thinking disposition and perceived academic control and the influence they have on academic achievement in college students.

The study was a longitudinal one that took place over four time periods from high school until the end of the student's first year of college. Results suggested a reciprocal relationship between perceived academic control and critical thinking dispositions.

Findings suggest that an advantage of high-perceived academic control in college fosters a willingness to think critically. The result is intuitive. Students are more likely to invest effort into critical thinking if they believe their grades will be influenced. In addition, the results indicate that students who are more disposed to think critically are more likely to feel in control over the various demands of their college environment. The indications are that students who are disposed to think critically are more likely to discover the controllable features of college and therefore have a greater tendency to view college as a high-control environment.

The effect of critical thinking disposition on GPA was weak. The authors attributed this finding as possibly an effect of GPAs being based on tests and assignments that require very little critical thinking. The authors surmised that if the study were replicated with second-, third- or fourth-year students, with more opportunities to engage in critical thinking, these results might be different. They also concluded that this finding could be attributed to the fact that critical thinking disposition is not a predictor of college students' achievement their first year because being disposed to think critically and being skilled at critical thinking are conceptually different and perhaps the skill dimension is a better predictor of GPA. They posited that even if disposition to think critically is not a strong predictor of GPA, it is still a valuable asset for college students to possess because being disposed to think critically makes it likely that they will use critical thinking skills outside of college (Stupniski et al., 2008).

This study, though conducted using college students, could have great ramifications on a study using middle school students, given that at this level, it is believed that many students do not feel they have control over their school culture and environment. If the students have low perceived academic control, this could have an

effect on their dispositions to think critically.

Many of the studies concerning critical thinking dispositions highlighted in this section of the literature review contain mixed results. Some contain conclusions that are contradictory; conversely, some of the studies support the findings of previous studies. Some of the consistencies of the studies concerning dispositions can be readily identified. First, several of the studies seemed to indicate that certain instructional interventions such as problem solving, inquiry, and open-ended discussion had a positive effect on the disposition to think critically (Burns, 2009; Durr et al., 1999; Ernst & Monroe, 2006; Lampert, 2006; Leader & Middleton, 2004; Liu, 2006; Miri et al., 2007; Warren et al., 2004).

Another correlation between the studies is that critical thinking dispositions are more likely to improve over longer periods of time (Bers et al., 1996; Durr et al., 1999; Ernst & Monroe, 2006; Giancarlo & Facione, 2001; Lampert, 2006; Leader & Middleton, 2004; Liu, 2006; Miri et al., 2007; Stupnisky et al., 2008). The authors of studies that showed weaker dispositions or little or no change in dispositions tended to attribute this to the short duration of the study (Bers et al., 1996; Burns, 2009).

There are conflicting findings with regard to the reciprocity of critical thinking skills and critical thinking dispositions, though the evidence weighs heavier that there is none (Burns, 2009; Durr et al., 1999; Ernst & Monroe, 2006; Liu, 2006). Leader and Middleton (2004) and Miri et al. (2007) did find evidence of reciprocity. Studies that concentrated on the effect of critical thinking dispositions on student achievement were inconclusive (Bers et al., 1996) or weak (Stupnisky et al., 2008).

Problems with Critical Thinking Instruction in Secondary History Classes

The second question to be researched in this study was whether there is a

difference in eighth-grade student dispositions toward their social studies classes after exposure to inquiry method teaching? It has been established that without dispositions, critical thinking skills and abilities are useless and cannot take place (Center for Comprehensive School Reform, 2005; Giancarlo et al., 2004; Halpern, 1998; Liu, 2006; Tishman et al., 1992). In fact, dispositions can negate (Tishman & Andrade, 1999) any attempt to have students exercise critical thinking abilities that they may possess.

Researchers often define dispositions as motivation or attitudes (Giancarlo et al., 2004; Leader & Middleton, 2004; Liu, 2006; Tishman, & Andrade, 1999) and student disposition toward traditional methods of teaching in history classes are often negative (Schug et al., 1982; Zhao & Hoge, 2005). Cutler (2014b) stated, “for over one hundred years some instructors have taught history as if they were preparing students for competition on a quiz show, by rewarding them for how much information they can recall and it is not relevant or engaging” (para. 1).

The High School Survey of Student Engagement (Kelly & VanSledright, 2001), a project of the Center for Postsecondary Research at Indiana University, found that boredom is a major problem among high school students. The central component of the project is the survey instrument which takes 30 minutes for students to complete. Survey questions investigate the levels and dimensions of student engagement at high schools, providing schools with data on student beliefs, attitudes, and behaviors. Since 2006, more than 350,000 students in over 40 states have taken the survey. Two of three respondents in 2009 were bored at least every day in class in high school; nearly half of the students (49%) were bored every day; and approximately one of every six students was bored in every class. Lack of engagement in the material taught played a role in student boredom. More than four of five noted a reason for their boredom as the material

being uninteresting, and about two of five students claimed that the lack of relevance of the material caused their boredom. The level of difficulty of the work was a source of boredom for a number of students: About one third of the students were bored because the work was not challenging enough. Just over one fourth of the respondents were bored because the work was too difficult. Instructional interaction played a role in student boredom as well: More than one third of respondents were bored due to having no interaction with a teacher. Traditional methods of instruction help the instructor to expedite curriculum at a faster pace, and engaging students in disciplinary exercises and critical problem-solving projects requires a heavy investment in time. However, Kelly and VanSledright's (2001) study showed that emphasis on pure recall has a detrimental effect on student dispositions toward exercising critical thought.

According to Mayer (2002), there are three types of learning outcomes: no learning, rote learning, and meaningful learning; and educators must strive to advance their students beyond simply recalling facts. Mayer believed that in order to encourage retention and transfer of knowledge and to lead students into meaningful learning, students must be authentically engaged.

Dicamillo (2010) reported on a study that explored the methods a U.S. history teacher used to promote higher order thinking and engagement in an urban high school preparatory class. This class was organized around a list of central topics to be explored during each unit of study. Students reflected on the central questions through class discussion, writing assignments, and culminating projects. It was made clear that students would need to know certain facts and be taught some background knowledge, but they would not memorize facts just for the sake of a test. The facts would help the students respond to essential questions. The goals were to develop critical thinking and

writing skills and develop a deep understanding of history. Culminating projects was the creation of the teacher. They were called “understanding performances” and used a variety of readings that gave multiple perspectives and role-playing performances to gain a deeper understanding and to answer central questions. Informal and formal assessments were used to gauge student understanding. Interviews with six students showed that they found the class interesting, relevant, and challenging; though some students struggled with higher level reading and projects. The teachers and students were teaching and learning for understanding and not just covering the textbook (Dicamillo, 2010).

Some teachers and instructors still cling to outdated and outmoded traditional methods of history instruction that bore their students and propagate a negative attitude toward the discipline. Teachers feel pressured to cover standards that include massive amounts of facts. Due to high-stakes testing, the teachers are responsible for covering these facts, and teachers have little time to examine any particular topic in depth (Doolittle et al., 2005; Harris et al., 2011; King et al., 2009; Martin & Wineburg, 2008; Stoskopf, 2001). Nosich (2005) believed that in some cases, teachers may or may not be able to incorporate critical thinking due to coverage; but if they do, it is not to the degree that it is needed. Sam Wineburg, director of Stanford Educational group, believed that we try to teach too much content and that history curriculum and textbooks books are excessively long. Wineburg (2005) believed that coverage does not mean that students are learning (Carlson, 2011). Wineburg stated,

History courses made up of all facts and no interpretation are guaranteed to put kids to sleep. And that’s exactly what seems to be happening. In a national survey some years ago, 1,500 Americans were asked to “pick one word or phrase

to describe your experience with history classes in elementary or high school.”

“Boring” was the most frequent answer. (para. 6)

Gallagher (2009) stated, “coverage sacrifices deep, rich teaching, chips away at student motivation and extinguishes student curiosity” (p. 10).

In addition to coverage, many teachers may choose to engage in traditional methods of instruction such as rote because they lack confidence in their content knowledge (Doolittle et al., 2005; Fragnoli, 2005). This does not mean that there is no place for rote memorization in the classroom or that reading textbooks cannot be useful. It is difficult for students to engage in problem solving, discussion, or inquiry without background content knowledge (Willingham, 2007). The teaching of critical thinking skills or higher order thinking skills is not practical in the absence of content. Swartz and Perkins (1990) stated that when thinking and content are learned together, the thinking illuminates the content and vice versa. The students are “learning ways of problem solving relevant to the content they are acquiring” (Swartz & Perkins, 1990, pp. 29-30). In order for effective learning to take place, both content and higher order thinking must have a place in instruction. The content helps give relevance to the thinking that is being engaged in. Effectiveness is achieved when teachers create a balance between domain knowledge and 21st century skills (Ciciora, 2009; Kek et al., 2011).

Bass and Good (2004) referred to this balance as “educare” v. “educere” (p. 162). They highlighted two Latin words for education: “educare,” which is defined as to training or molding. This definition is interpreted as one that calls for rote memorization and becoming good workers; and “educere,” which means the opposite. According to Bass and Good, this term means “to lead out” or questioning, thinking, and creating. The authors pointed out that despite the need to balance the two and for schools to engage in

both functions, too often, they concentrate solely on educate. Bass and Good maintained that schools should strive for balance.

Brady (2008) gave yet another reason for a certain amount of coverage of material. He submitted the idea that the older generation has answers to very important questions about how the world works, and passing these answers along saves the young from having to figure out everything for themselves. According to Brady, it transmits certain insights to modern-day students, allowing them to concentrate more intensely on certain historical questions of great importance and not have to figure out all historical questions for themselves.

The third research question asks if there is a correlation between dispositions toward critical thinking and dispositions toward the student's social studies class. There is a gap in the literature as to this question; therefore, this study seeks to provide an answer.

The Importance of Encouraging Historical Thinking

Can particular types of instruction have an effect on both student dispositions toward using higher critical thinking skills and dispositions toward social studies classes themselves? According to Maloy and LaRoche (2010), "many history and social studies teachers who might otherwise use student-centered instructional practices now view teacher-centered instruction as the best way to teach students the large amounts of material needed for the test" (p. 47). Additionally, it has been established that history is perceived as boring and unimportant, and many students have negative attitudes toward the discipline (Kelly & VanSledright, 2001). If they have these negative attitudes toward the discipline, it is difficult to imagine that they are disposed in those classes to use their critical thinking skills. How then do we make sure that students are engaged and excited

and that attitudes toward history classes are positive?

Many think the way to accomplish this is to make sure students are not just absorbing facts but actually “doing” or engaging in the study of history. This type of student-centered instructional method should analyze and question historical texts and practice historical thinking (Martin & Wineburg, 2008). According to Martin and Wineburg (2008), “Analyzing and questioning historical texts seems mysterious and even unnecessary in many history classrooms, even though practicing historians see it at the heart of their daily practice” (p. 3). In an interview with David Cutler (2014a) in *The Atlantic Online*, Pulitzer Prize winning historian Eric Foner stated,

We try to teach people the skills that come along with studying history. The skills of evaluating evidence, of posing questions and answering them, of writing, of mobilizing information in order to make an argument. I think all of that is important in democratic society if people are going to be active citizens.

Teaching to the test does not really encourage emphasis on those aspects of studying history. (para. 7)

Burenheide (2007) gave the results of an ongoing research project entitled *What Good History Teachers Do?* It is a qualitatively grounded theoretical study in which the participants share the activities of their classrooms and how instructors have gotten their students to struggle with historical issues. The literature and interviews with participating teachers found that successful teaching of history occurs through active inquiry and involvement with the content. In short, participants highlighted the importance of an investigative curriculum (Burenheide, 2007). According to Hicks et al. (2004) an investigative curriculum includes historiography, a critical examination of sources, and an exploration of historical sources. Students are encouraged to more

deeply study history (Eamon, 2006) and engage their minds on historical evidence, practice inquiry, evaluation, problem solving, judgment, and synthesis (Edmonds et al., 2005).

Levy and Petrulis (2012) conducted a qualitative, longitudinal study investigating a cohort of student inquiry and research experiences as they progressed through their undergraduate programs. They found that when students developed their own ideas or made their own discoveries, it fostered a student's sense of intellectual freedom, personal authority, and identification with their academic or professional discipline.

They conducted an annual cycle of three interviews comprised of two group interviews, one which took place at the beginning of the year and one at the end, and one individual interview held halfway through the year. The focus of the study followed the evolution of experiences closely over time. These results only reported the first year of each student's experience. The students cited experiences that included question-oriented lectures, seminars, online discussions, essays, case studies, and small-scale empirical investigations and active inquiry. The students experienced inquiry in four ways: gathering information, exploring other people's ideas, evidencing and developing students' own ideas, and making discoveries. The students defined inquiry as finding things out for themselves instead of having things given to them. Research and gathering information was cited as the most common approach. They defined research as locating and collecting information beyond what was made readily accessible.

The results found that the students expressed excitement about engaging with a knowledge base through inquiry. They cited that enhanced motivation and interest in a subject matter improved retention of information when they found out things for themselves. The Levy and Petrulis (2012) study illustrated that engaging the material in

more depth, and in the case of history, actually using the historian's skills, improves student attitudes toward the discipline and possibly has an effect on student dispositions to use their critical thinking skills.

Inquiry and Disposition to Use Critical Thinking Skills

One of the recurring characteristics of effective critical thinking instruction mentioned in the previous studies is engagement in inquiry. According to the Hewlett Steering Committee (Lee, Greene, Odom, Schechter, & Slatta, 2004), a loosely organized coordinating body for various inquiry-guided learning groups at North Carolina State University, inquiry guided learning refers to “an array of classroom practices that promote student learning through guided and increasingly independent investigation of complex questions and problems, often for which there is no single answer” (p. 9). Rather than teaching the results of other investigations which students learn passively, instructors assist students in mastering and learning through the process of active investigation. The process involves the ability to formulate good questions, identify and collect appropriate evidence, present results systematically, analyze and interpret results, formulate conclusions, and evaluate the worth and importance of those conclusions. It nurtures curiosity, initiative, and risk taking (Lee et al., 2004).

Nosich (2012) stated that curiosity is a natural catalyst of any investigation and encourages questioning. He noted that effective inquiry is predicated upon well thought out questions, and critical thinking begins with asking questions. “Authentic inquiry,” according to Donham (2010), “requires risk-taking; it requires entering into the quest for answers to unanswered questions—exploring unknowns” (para. 3). Barton (2005) stated that

inquiry, in an historical context, requires that students not only ask questions, but

that they develop and pursue meaningful questions, make informed choices about the evidence that they can use to answer those questions and then gain experience drawing conclusions from the evidence. (p. 753)

Golden (2011) believed students begin to think like expert thinkers when they are encouraged to ask thought-provoking questions. It encourages them to learn the skills and dispositions of critical thinkers.

Rusche, Kendra, and Kendra (2011) conducted a study to see whether students would be disposed to develop critical thinking skills through inquiry-guided learning and critical self-reflection. They described five inquiry exercises and three reflection exercises given to students culminating in an analytical essay. The students engaged the course material based on inquiry and analyzed their own writing as data. By doing this, the students learned the importance of inquiry-guided instruction and self-reflection. The authors found that the students showed growth as intellectual thinkers by examining their writing from the start of the study until the end. In addition, the authors maintained that the students gained a skill set such as independent inquiry, critical thinking, and reasoned judgments that can be used in lifelong learning (Rusche et al., 2011).

Savich (2008) was concerned with apathy and boredom created in secondary-level history classes that rely almost solely on rote memory. He sought how to most effectively teach critical thinking skills to his history students and to how to motivate his students to change their negative attitudes and apathy about history.

Two classes of eleventh- and twelfth-grade high school history students were chosen to participate in the study for 8 weeks, or two units of instruction. Both quantitative and qualitative measures were used for conducting action research to determine what method of instruction would be most effective. One group, the control

group, was given direct instruction through the lecture method; and the other experimental group was taught using an inquiry approach. The author used performance on essays, assignments, quizzes, and test grades to determine whether students could analyze, evaluate, conceptualize, and synthesize information. These assessments were used to collect quantitative data, while the researcher kept a logbook to record qualitative data. This recorded, observational data included logging a score for participation, discussion, and activity. The inquiry method utilized in this study included role playing, reenactments, examining and analyzing multiple texts, studying oral and visual presentations, examining different viewpoints, and analyzing primary source documents.

The results indicated that when critical thinking was emphasized under the inquiry method, students scored higher on assessments. When students were motivated, engaged, and showed a positive attitude toward higher order thinking or a strong disposition toward critical thinking, positive results were gained. The researcher pointed out that the lecture method was useful for providing background knowledge and that critical thinking was most effective when combined with subject content. This study also reinforced the idea that dispositions and critical thinking ability might be reciprocal and may have a positive effect on achievement and performance.

As discussed previously, Miri et al. (2007) found after their longitudinal study of the effects of purposefully teaching for the promotion of higher order thinking skills among high school science students that inquiry was one of the teaching strategies identified as being effective.

Chapter 3: Methodology

Introduction

Sample (2011) believed that coverage of too many standards causes the enduring understandings, or what we want students to understand about the material taught, to become lost. In addition, traditional methods of teaching do not encourage history students to think beyond knowledge level, leading to negative attitudes among students toward history classes and inhibiting their dispositions toward critical thinking (Cutler, 2014b; Doolittle et al., 2005; Harris et al., 2011; Kelly & VanSledright, 2001; King et al., 2009; Martin & Wineburg, 2008; Stoskopf, 2001).

This study sought to discover if a change would occur in eighth-grade history students' critical thinking dispositions after implementing an instructional program of inquiry, if a change would occur in eighth-grade student dispositions/attitudes toward their social studies classes after that same instructional program of inquiry, and whether or not there would be a correlation between the two.

As explained in Chapter 2, research highlighted in this study yielded varying results and included multiple instructional methods (Durr et al., 1999; Leader & Middleton, 2004; Liu, 2006; Miri et al., 2007). The research measured elementary or college-level students and not secondary school students (Bers et al., 1996; Burns, 2009; Giancarlo & Facione, 2001; Lampert, 2006; Stupniski et al., 2008), measured data from disciplines other than history (Bers et al., 1996; Burns, 2009; Ernst & Monroe, 2006; Giancarlo & Facione, 2001; Lampert, 2006; Leader & Middleton, 2004; Liu, 2006; Miri et al., 2007), or measured data from other disciplines in addition to history (Durr et al., 1999; Stupniski et al., 2008).

There is a gap in the literature with few studies focused solely on the effect of

inquiry on the critical thinking dispositions of middle school students generally and eighth-grade middle school students particularly. In addition, there was a gap in the literature concerning student dispositions toward social studies classes. No appreciable studies have been conducted regarding student dispositions/attitudes toward social studies since the 1980s (Schug et al., 1982).

Participants

This study was a quasi-experimental design due to its use of intact groups (Creswell, 2012). Because random assignment of participants to groups in the proposed study would have disrupted the learning process, intact groups were utilized.

The guidance department and administrators select academic teams based on certain criteria. According to the eighth-grade guidance counselor (personal communication, February 26, 2016), the guidance department and administrators strive to keep a balance between teams with regard to gender, ethnicity ratio, and numbers of special education students. Discipline history and behavior are also factors. Counselors and administrators separate students who have had discipline issues with one another in the past, and they take into account teacher/student personalities and team makeup. They strive to give each team an equal number of students and an equal number of advanced and regular classes. Due to the meticulous selection of students for team structure by the guidance department and administrators, an approximate homogeneity was achieved; however, the researcher was prohibited from altering the sample groups or meticulously, homogenously grouping the sample in any way.

Eighth-grade students at the school utilized in this study were divided into two teams. Since the researcher teaches one of these teams of eighth graders, the other team of eighth graders was chosen as the sample group in order to reduce bias. A sample of 50

students comprising two classes from this eighth-grade team was utilized in the study. The sample team of students consisted of two “regular” or college-preparatory classes. Each class included students with a wide range of ability levels. The abilities in these classes ranged from resource students, special education students, “average” performing students, and students who could perform adequately in advanced classes but chose not to enroll in those classes.

Instruments

The study was mixed methods (Creswell, 2012), relying on statistical analysis, student responses to validated and researcher-created surveys, and researcher observation. The first instrument used in the study measured the first research question: whether or not there is a difference in eighth-grade student dispositions toward critical thinking after exposure to inquiry method teaching? The California Measure of Mental Motivation was created because Giancarlo and Facione (2000) cited a lack of knowledge about critical thinking dispositions of elementary and secondary students. They attributed this to lack of a suitable assessment tool for this population. The tool was designed to measure the degree to which an individual is cognitively engaged and mentally motivated toward intellectual activities involving reasoning. It targets four main dispositional aspects of critical thinking: open-mindedness, self-regulation, commitment to learning and mastery, and creative problem solving (Giancarlo & Facione, 2000). This instrument was used to measure mean averages gathered at the beginning and conclusion of the study. It has been utilized in previous studies of student dispositions and therefore can be considered a reliable instrument (Burns, 2009; Giancarlo & Facione, 2001).

For the purposes of this study, the California Measure of Mental Motivation II (Insight Assessment, 2014) was utilized to measure middle school student dispositions

toward critical thinking. This updated version measures the degree to which older children and adolescents in Grades 6-12 (secondary school) are cognitively engaged and mentally motivated toward intellectual activities. Five scale scores were reported including mental focus, learning orientation, creative problem solving, cognitive integrity, and scholarly rigor. Table 1 explains the scale scores that are used by the CM3II+ to measure student dispositions toward critical thinking (Insight Assessment, 2014).

Table 1

Five Scale Scores and Explanations as Reported by the California Measure of Mental Motivation II+

Scale Score	Explanation
Mental Focus	The discipline or habit of being diligent, systematic, task oriented, organized, and clearheaded.
Learning Orientation	The tendency or habit of seeking to increase one's knowledge and skills; toward valuing the learning process as a means to accomplish mastery over a task; toward being interested in challenging activities; and toward using information seeking as a personal strategy when problem solving.
Creative Problem Solving	The habit or tendency of approaching problem solving with innovative or original ideas and solutions; toward feeling imaginative, ingenious, original and able to solve difficult problems; toward engaging in activities such as puzzles, games of strategy; and toward striving to understand the underlying function of objects.
Cognitive integrity	The habit of interacting with differing viewpoints for the sake of learning the truth or reaching the best decision, it is the tendency to express strong intellectual curiosity and value fairmindedness and sound reasoning.
Scholarly Rigor	The habit of working hard to engage and correctly interpret new material; it is the tendency to put forth the mental effort to achieve a deeper understanding of complex or abstract ideas and information.

The California Measure of Mental Motivation (CM3II+) was given to the sample of students at the beginning and the conclusion of the study, 12 weeks apart. According

to Creswell (2012), a t test is an effective measure of variance when analyzing quantitative data among one group; therefore, a matched-paired t test was used to determine increase or decrease in dispositions toward critical thinking. A table of mean scores was used to illustrate increase or decrease in dispositions toward critical thinking (Creswell, 2012).

According to Laerd Statistics (2013a), Chronbach's alpha is the most common measure of internal consistency or reliability. The internal consistency of scores of the CM3II+ test was evaluated in three validation studies using this instrument. Table 2 demonstrates the internal consistency scores of each attribute domain of the CM3II+ test using the Chronbach's alpha instrument (Insight Assessment, 2014). According to Goforth (2017), an alpha coefficient of .50 or above is acceptable.

Table 2

Internal Consistency Scores of Each Attribute Domain (Scale Score) of the CM3II+ Test using the Chronbach's Alpha Measure

Attribute Domains	Alpha Coefficient
Learning Orientation	.79 - .83
Creative Problem Solving	.70 - .77
Mental Focus	.79 - .83
Cognitive Integrity	.53 - .63
Scholarly Rigor	.60 - .78

A researcher-created survey was used to determine student dispositions toward their history class. No existing survey was found that specifically measured middle school student dispositions toward their history classes; therefore, despite the issues of internal consistency, a survey was created utilizing a four-point Likert scale. According to Laerd Statistics (2013a), Cronbach's alpha is the most common measure of internal consistency in a Likert survey; therefore, this measure was used to determine internal

consistency. The alpha coefficient of the teacher-created survey was .70. An alpha coefficient of greater than .50 is considered acceptable (Goforth, 2017). The survey was given at the beginning and end of the 12-week treatment period to determine any changes in student dispositions toward history class after receiving inquiry-based lessons.

Given that the focus of the study was holistic scores and independent student identifications were not recorded for this survey, Laerd Statistics (2013b) suggests an independent t test as an effective measure of variance when analyzing quantitative data among two unrelated groups.

In order to analyze the results of the last research question asking if there was a correlation between dispositions toward critical thinking and dispositions or attitudes toward the student's social studies class, a Pearson r test was employed to compare and analyze the two data sets. According Horst (2013), a test of correlation or a Pearson r should be employed to measure strength of correlation between two noncontrolled variables. Table 3 below summarizes the three research questions, the types of data collection utilized, and the instrument of measure for each.

Table 3

Research Question, Type of Data Collection Used, and Instrument of Measure for Each

Research Question	Type of Data Collection	Instrument of Measure
Is there a difference in eighth grade student dispositions toward critical thinking after exposure to inquiry method teaching?	California Measure of Mental Motivation II+	Matched-Pairs t Test
Is there a difference in eighth-grade student dispositions toward their social studies classes after exposure to inquiry method teaching?	Researcher-created four-point Likert survey	Independent t Test
Is there a correlation between dispositions toward critical thinking and dispositions or attitudes toward the students' social studies class?	Both the <i>CM3II+</i> and the researcher-created test four-point Likert surveys	Pearson's r

Procedures

The first step of the study was to determine the participants. The study was quasi-experimental (Creswell, 2012); therefore, intact groups were utilized. The researcher and the instructor of the sample of the eighth-grade social studies students determined which classes were included in the sample. A sample of 50 eighth-grade social studies students containing two college-preparatory or “regular” classes was utilized. Once the sample was selected, the students were administered a pretest of the *CM3II+* by the eighth-grade teacher in order to answer the first research question, asking if there would be a difference in eighth-grade student dispositions toward critical thinking after exposure to a program of inquiry method teaching.

Upon completion of the *CM3II+* pretest, the eighth-grade teacher administered the researcher-created four-point Likert scale pretest designed to answer the second

research question that asked whether or not there was a difference in eighth-grade student dispositions or attitudes toward their social studies classes after exposure to inquiry method teaching.

With the sample group having completed both pretests, the eighth-grade teacher proceeded to incorporate nine critical thinking lessons into his primarily traditional-based program of study which included lecture, note taking, textbook reading, and bookwork. The Stanford History Education Group created the critical thinking lessons that were utilized. The Stanford History Education Group is collaboration among many people: full-time staff, graduate student RAs, practicing teachers, and undergraduate volunteers and interns. It was founded in 2002 when Sam Wineburg moved from the University of Washington to Stanford. Stanford History Education Group's (2006) Teacher Education Program (STEP) became the originator for new ideas about teaching students how to read history texts and think about them in creative ways. The Reading Like a Historian curriculum has passed 3.3 million downloads. It is used in all 50 states and in 127 countries (Stanford History Education Group, 2006). Each lesson revolves around a central historical question and features sets of primary documents designed for groups of students with diverse reading skills and abilities and include plans of instruction. Nine of these lessons were interspersed with the traditional methods of instruction over a 12-week period. Although each lesson plan included exactly what the teacher should say when introducing and delivering the lesson, the researcher met with the teacher before implementing each lesson to discuss the structure of the lesson. In addition, the researcher observed the teacher's classroom on the day each lesson was implemented in order to ensure fidelity of implementation. Upon conclusion of the 12-week treatment period, the teacher administered the CM3II+ posttest and the researcher-created four-

point Likert survey to the students again in the form of a posttest.

Insight Assessment (2014) compared the resulting data of the pre and posttests (CM3II+) using matched-pairs analysis. The data were analyzed by the researcher to determine any increase and/or decrease in dispositions toward critical thinking among the students. A match-paired t test (Creswell, 2012) was utilized to compare results of the two researcher-created surveys to determine any increase and/or decrease in student dispositions/attitudes toward their history classes.

In order to analyze the results of the last research question asking if there was a correlation between dispositions toward critical thinking and dispositions or attitudes toward the students' social studies class, it was determined that the data are categorical and have a normal distribution and are therefore parametric. The parametric measure for strength of correlation that was utilized is the Pearson's r (Horst, 2013).

Any significant qualitative data that were included in the proposed study were based on the researcher's observations during the course of the study.

Limitations

The first limitation of the study concerns the sample of students included. This study is quasi-experimental (Creswell, 2012) because random assignment of the sample groups would result in a disruption of the learning process. Intact groups had to be utilized. This meant that students could not be grouped based on any particular characteristic.

A second limitation of the study concerned fidelity of implementation. Although the Stanford Reading Like an Historian lessons have meticulous, ordered instructions for implementation, a colleague, as opposed to the researcher, implemented the critical thinking lessons. This leaves the implementation of each lesson open to the instructor's

interpretation to some degree. To minimize this limitation and to ensure fidelity of implementation, the participating teacher stayed true to the scripted directions for implementation of the lesson as much as possible. In addition, the researcher met with the teacher in advance of each lesson to discuss the expectations of each lesson and their understandings of how each lesson should be executed. The researcher also observed the introduction of each lesson by visiting the teacher's classroom when instructions were given.

To minimize any effect on the participating teacher and students' standardized test scores, the Stanford lessons were given in addition to the standard curriculum. Material that appears on the yearly state standardized assessment can be found in the state standards and the state support document. Notes given by the eighth-grade social studies teachers are based on information found in these documents. This ensures that the material found in the state standards and indicators tested by the state standardized test for social studies were fully covered. The Stanford lessons were used only to reinforce the notes given and were added to the curriculum. Nothing was excluded from the curriculum.

The third limitation of the study was length of treatment. Based on previous studies, it is difficult to determine a proper length of study. Previous studies contained treatment times where data collection was not longitudinal and was collected at one point in time (Lampert, 2006) to 4 years (Giancarlo & Facione, 2001). Treatment length for this study consisted of 12 weeks.

Though attitude surveys can be found in abundance, this researcher could find no instruments measuring student dispositions/attitudes among eighth-grade history students toward their history classes specifically. As a result, a researcher-created survey utilizing

a four-point Likert scale was created. This raised the issue of internal consistency (Laerd Statistics, 2013b) of the instrument, in that it had never been utilized in any previous study.

Chapter 4: Results

Introduction

Too many history teachers rely on rote memorization due to state standards that place an emphasis on teaching to a multiple choice standardized test. These tests are based on state standards that contain so much material that the enduring understandings get lost in the need to cover them all (Eamon, 2006; Martin & Wineburg, 2008; Sample, 2011). Traditional methods of teaching may solve the problem of coverage but do not dispose students to think beyond the knowledge level and can lead to negative attitudes toward history class (Cutler, 2014b; Kelly & VanSledright, 2001).

The number of studies measuring dispositions toward critical thinking is small (e.g., Leader & Middleton, 2004; Liu, 2006; Miri et al., 2007; Stupnisky et al., 2008), and the results are varied. The number of studies measuring student dispositions toward their social studies classes is smaller still, but the results do not vary and show consistently negative student attitudes toward their history classes (Savich, 2008; Schug et al., 1982; Zhao & Hoge, 2005).

This study sought to measure the dispositions of eighth-grade history students toward critical thinking and history class after incorporating a 12-week course of inquiry into regular classroom instruction. It would be difficult to determine whether any change in dispositions after an intervention of inquiry lessons was caused by the lessons themselves or a general increase in positive attitudes toward the course after participating in something other than traditional instruction. For this reason, the study also sought to determine if there is a correlation between dispositions toward critical thinking and dispositions toward social studies class.

Due to a miscommunication between the researcher and Insight Assessment,

student identification numbers were included in the pre and posttest surveys that they scored. Creswell (2012) recommended the match paired t test when analyzing quantitative data within one group. For this reason, a matched paired t -test analysis was used to determine if there were any significant changes in dispositions toward critical thinking. The focus of this study was to measure the scores holistically and not individually. Therefore, student identifications were not recorded when the students completed the pre and posttest researcher-created survey measuring student dispositions toward social studies class. Given that this data set included finding the mean of two unrelated groups, an independent t test was used (Laerd Statistics, 2013b).

Finally, a Pearson's r test was utilized to determine if there was any correlation between dispositions toward critical thinking and dispositions toward the students' history classes. By answering this question, the researcher sought to determine whether or not students who have a greater/lesser disposition toward critical thinking in history class also have a more positive/negative disposition toward their history class. In turn, the researcher sought to determine whether or not students who have a greater/lesser disposition toward history class also have a more positive/negative disposition toward critical thinking. A test of correlation or a Pearson r is often used to measure strength of correlation between two noncontrolled variables (Horst, 2013).

Quantitative Results

Research Question 1

The first research question asked if there is a difference in eighth-grade student dispositions toward critical thinking after exposure to inquiry method teaching over a span of 12 weeks. The survey instrument used to measure eighth-grade student dispositions toward critical thinking was purchased from Insight Assessment (2014).

Because the CM3II+ can only be purchased exclusively from Insight Assessment, it is confidential and cannot be reproduced. In any capacity, the researcher requested to have the company release sample questions to provide here; however, the request was denied as found in Appendix A.

Of the 50 students who took the pretest CM3II+ and 47 students who took the posttest CM3II+, only 41 cases could be compared. Some posttest scores were eliminated due to large amounts of missing data, some students skipped items, some engaged in repetitive marking (e.g., b,b,b,b,b,b,b,b,b,b,b,b,b), and some students transferred out of the school, were suspended, or expelled.

The instrument assessed five scales that measure middle school student dispositions toward critical thinking such as mental focus, creative problem solving, learning orientation, cognitive integrity, and scholarly rigor. The first scale measured by the CM3II+ was Mental Focus. According to Insight Assessment (2015), Mental Focus measures the discipline or habit of being diligent, systematic, task-oriented, organized, and clear-headed. A student who obtains a positive score on this scale stays on task, and approaches problems in a systematic, organized, focused and timely way. A positive score on Mental Focus indicates a student who stays on task and approaches problems and learning in a systematic, focused, organized, timely and clear-headed way on most occasions. (“Measures,” para. 1)

Table 4

Results of a Paired-Samples t-Test for Mental Focus

Outcome	Pretest		Posttest		n	95% CI for Mean Difference	p	t	df
	M	SD	M	SD					
	26.1	6.4	25.9	5.2	41	-1.27, 1.76	0.75	0.32	.24

Note. * $p > .05$. There was no significant difference in the scores for pretest ($M=26.1$, $SD=6.4$) and posttest ($M=25.9$, $SD=5.2$) conditions; $t(81)=-.32$.

Table 4 shows the results of a paired-samples t test comparing pre and posttest CM3II+ scores for 41 eighth graders for the scale Mental Focus. The t value for the pre and posttest was 0.32, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = 0.75. The students' mean score stayed constant at 26 after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for Mental Focus after a 12-week period of inquiry lessons.

The second scale measured by the CM3II+ was Creative Problem Solving.

According to Insight Assessment (2015), Creative Problem Solving

measures the habit or tendency of approaching problem-solving with innovative or original ideas and solutions; toward feeling imaginative, ingenious, original and able to solve difficult problems; toward engaging in activities such as puzzles, games of strategy; and toward striving to understand the underlying function of objects. A positive score on Creative Problem Solving indicates a student with intellectual curiosity, creativity, and a preference for challenging and complicated activities. ("Measures," para. 2)

Table 5

Results of a Paired-Samples t Test for Creative Problem Solving

Outcome	<u>Pretest</u>		<u>Posttest</u>		n	<u>95% CI for Mean Difference</u>		p	t	df
	M	SD	M	SD						
	25.9	6.1	27.2	5.8	41	-3.0	.30	.11	1.66	-1.3

Note. * $p > .05$. There was not a significant difference in the scores for pretest ($M=25.9$, $SD=6.1$) and posttest ($M=27.2$, $SD=5.8$) conditions; $t(81)=1.66$.

Table 5 shows the results of a paired-samples t test comparing pre and posttest CM3II+ scores for 41 eighth graders for the scale Creative Problem Solving. The t value for the pre and posttest was 1.66, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = .11. The students' mean score stayed constant at 26-27 before and after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for Creative Problem Solving after a 12-week period of inquiry lessons.

The third scale measured by the CM3II+ is Learning Orientation. According to Insight Assessment (2015), Learning Orientation

measures the tendency or habit of seeking to increase one's knowledge and skills; toward valuing the learning process as a means to accomplish mastery over a task; toward being interested in challenging activities; and toward using information seeking as a personal strategy when problem solving. A positive score on Learning Orientation indicates inquisitiveness and a desire to learn things. ("Measures," para. 3)

Table 6

Results of a Paired-Samples t-test for Learning Orientation

Outcome	<u>Pretest</u>		<u>Posttest</u>		n	<u>95% CI for Mean Difference</u>		p	t	df
	M	SD	M	SD						
	31.7	7.0	30.8	7.3	41	-1.4, 3.3		.80	.81	.93

Note. * $p > .05$. There was not a significant difference in the scores for pretest ($M=31.7$, $SD=7.0$) and posttest ($M=30.8$, $SD=7.3$) conditions; $t(81) = .80$.

Table 6 shows the results of a paired-samples t test comparing pre and posttest CM3II+ scores for 41 eighth graders for the scale Learning Orientation. The t value for the pre and posttest was .80, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = .80. The students' mean score stayed constant at 32-31 before and after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for Learning Orientation after a 12-week period of inquiry lessons.

The fourth scale measured by the CM3II+ is Cognitive Integrity. According to Insight Assessment (2015), Cognitive Integrity is the habit of interacting with differing viewpoints for the sake of learning the truth or reaching the best decision, it is the tendency to express strong intellectual curiosity and value fair-mindedness and sound reasoning. A positive score on Cognitive Integrity indicates a student who is motivated to use their thinking skills to solve problems, and who values courageous truth seeking and open-mindedness even when dealing with complicated or difficult problems or issues. ("Measures," para. 4)

Table 7

Results of a Paired-Samples t Test and Descriptive Statistics for Cognitive Integrity

Outcome	<u>Pretest</u>		<u>Posttest</u>		n	<u>95% CI for Mean Difference</u>		p	t	df
	M	SD	M	SD						
	26.7	6.3	25.4	7.4	41	-1.31, 3.94		.32	1.0	1.3

Note. * $p > .05$. There was not a significant difference in the scores for pretest ($M=26.7$, $SD=6.3$) and posttest ($M=25.4$, $SD=7.4$) conditions; $t(81)=1.0$.

Table 7 shows the result of a paired-samples t test comparing pre and posttest CM3II+ scores for 41 eighth graders for the scale Cognitive Integrity. The t value for the pre and posttest was 1.0, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = .32. The students' mean score dropped almost imperceptibly from 27 before and 25 after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for Cognitive Integrity after a 12-week period of inquiry lessons.

The last scale measured by the CM3II+ was Scholarly Rigor. Insight Assessment (2015), defined Scholarly Rigor as

the habit of working hard to engage and to correctly interpret new material, it is the tendency to put forth the mental effort to achieve a deeper understanding of complex or abstract ideas and information. A positive score on Scholarly Rigor indicates a person with the habit of putting forth effort to engage difficult material and to strive for deeper understanding. ("Measures," para. 5)

Table 8

Results of a Paired Samples t-Test and Descriptive Statistics for Scholarly Rigor

Outcome	<u>Pretest</u>		<u>Posttest</u>		n	<u>95% CI for Mean Difference</u>		p	t	df
	M	SD	M	SD						
	26.4	5.2	27.3	5.2	41	-2.313, 0.557		0.22	1.2	-0.88

Note. * $p > .05$. There was not a significant difference in the scores for pretest (M=26.4, SD=5.2) and posttest (M=27.3, SD=5.2) conditions; $t(81) = 1.2$.

Table 8 shows the results of a paired-samples t test comparing pre and posttest CM3II+ scores for 41 eighth graders for the scale Scholarly Rigor. The t value for the pre and posttest was 1.2, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = 0.22. The students' mean score stayed constant at 26 before and 27 after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for Scholarly Rigor after a 12-week period of inquiry lessons.

Research Question 2

The second research question asked if there was a difference in eighth-grade student dispositions toward their social studies classes after exposure to inquiry method teaching. The pre and posttest surveys used to measure student dispositions toward their history classes were researcher created. The instrument can be found in Appendix B. The surveys consisted of 14 four-point Likert scale questions grouped together into three groups. The first five questions asked the students about traditional methods of teaching. The second group of five questions asked the students about higher level thinking methods of instruction. The last four questions asked the students about their attitudes toward their history classes. Due to insurances of confidentiality, individual identification of each survey taker was not recorded; therefore, the researcher is finding

the mean of two unrelated groups (Laerd Statistics, 2013b). As a result, independent t tests were conducted as opposed to paired-samples t tests.

The first five items on the survey were grouped as questions that asked the students if they felt their history classes had primarily used traditional instruction such as textbooks, worksheets, notetaking, lecture, and memorizing facts. The second five items on the survey were grouped as questions that asked the students if they felt their history classes had primarily used instruction that utilized critical thinking methods such as projects, independent research to answer historical questions, independent research to solve historical problems, group research to answer historical questions, and group research to solve historical problems. The last four items on the survey were grouped as questions about the students' attitudes toward their history classes such as whether or not their classes were boring, interesting, important, or exciting.

Table 9

Results of an Independent t Test for Traditional Methods of Teaching History

	95% CI for Mean										
	<u>Pretest</u>			<u>Posttest</u>			<u>Difference</u>		p	t	df
	M	SD	n	M	SD	n					
Teaching Methods	15.36	2.65	50	14.46	2.44	45	-.150, 1.937	.093	1.69	93	

Note. * $p > .05$. A single samples t test was conducted to measure use of traditional methods of teaching scores for pretest and posttest conditions.

Table 9 shows the results of a single-samples t test comparing pre and posttreatment survey scores for 50 and 41 eighth graders respectively for traditional methods of teaching history. The t value for the pre and posttest was 1.7, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = .093. The students' mean score dropped almost imperceptibly from 15.4 before to 14.5 after the program of inquiry. Based on these data, one can conclude that there is no significant

difference in mean scores for traditional methods of teaching history after a 12-week period of inquiry lessons. This shows the students did not perceive a change in instructional methods used in their social studies class.

Table 10

Results of an Independent t Test and Descriptive Statistics for Critical Thinking Methods of Instruction

	95% CI for Mean										
	<u>Pretest</u>			<u>Posttest</u>			<u>Difference</u>		p	t	df
	M	SD	n	M	SD	n					
CT Methods	13.00	2.73	50	14.34	2.14	45	-2.37, -.320	.011	-2.6	90	

Note. * $p > .05$. A single samples t test was conducted to measure use of critical thinking methods of teaching scores for pretest and posttest conditions.

Table 10 shows the results of a single-samples t test comparing pre and posttest survey scores for 50 and 45 eighth graders respectfully for critical thinking methods of teaching history. The t value for the pre and posttest was -2.6, showing a statistical significance at the $p \leq$ the .05, specifically a p (significant) = .011. The students' mean score increased from 13 before to 14.3 after the program of inquiry. Based on these data, one can conclude that there is a significant difference in mean scores for critical thinking methods of teaching history after a 12-week period of inquiry lessons. This means that the students perceived a change in the critical thinking methods employed within this social studies class.

Table 11

Results of an Independent t Test for Dispositions/Attitudes toward History Class

	<u>Pretest</u>			<u>Posttest</u>			95% CI for Mean		p	t	df
	M	SD	n	M	SD	n	<u>Difference</u>				
Dispositions	11.12	1.70	50	10.84	1.75	45	-.430, .989	.44	.79	92	

Note. * $p > .05$. A single samples t test was conducted to measure Dispositions/Attitudes toward history class scores for pretest and posttest conditions.

Table 11 shows the results of a single-samples t test comparing pre and posttest survey scores for 50 and 45 eighth graders respectively for dispositions toward history classes. The t value for the pre and posttest was .79, showing no statistical significance at the $p \leq .05$, specifically a p (insignificance) = .437. The students' mean score decreased from 11.1 before to 10.8 after the program of inquiry. Based on these data, one can conclude that there is no significant difference in mean scores for student dispositions toward history class after a 12-week period of inquiry lessons.

Research Question 3

Research Question 3 sought to determine whether or not there was a correlation between eighth-grade student dispositions toward critical thinking and eighth-grade student dispositions or attitudes toward history class in general. Because the CM3II+ is an instrument that is divided into five scales measuring different attributes of dispositions toward critical thinking and the teacher-created survey is divided into three sections measuring different aspects of dispositions toward history class, it must be determined which subscale of the CM3II+ and which section of the researcher-created survey come closest to measuring similar dispositions.

According to Insight Assessment (2015), the Scholarly Rigor subscale measures students' habits of working hard to engage and correctly interpret new material and the mental effort that students put forth to understand that material. It was decided that this subscale was best compared with the section of the researcher-created survey that measures disposition or attitude toward history class specifically. These questions from the researcher-created survey are illustrated in Figure 1.

<p>11. My social studies classes were boring.</p> <ul style="list-style-type: none">○ Strongly Agree○ Agree○ Disagree○ Strongly Disagree <p>12. My social studies classes were interesting.</p> <ul style="list-style-type: none">○ Strongly Agree○ Agree○ Disagree○ Strongly Disagree <p>13. My social studies classes were important.</p> <ul style="list-style-type: none">○ Strongly Agree○ Agree○ Disagree○ Strongly Disagree <p>14. My social studies classes were exciting.</p> <ul style="list-style-type: none">○ Strongly Agree○ Agree○ Disagree○ Strongly Disagree

Figure 1. Last Four Questions from Researcher-Created Survey Measuring Eighth-Grade Student Attitudes/Dispositions Toward History Class.

The pretest scores for the CM3II+ subscale Scholarly Rigor were compared with the pretest scores for the researcher-created survey section measuring Attitudes toward History Class using a Pearson's r measure of correlation. Additionally, the posttest scores of the CM3II+ subscale Scholarly Rigor were compared with the posttest scores of the researcher-created survey section measuring Attitudes toward History Class, using a Pearson's r measure of correlation.

Table 12

Pearson's Product Moment Correlations for CM3II+ Scholarly Rigor Scale Pretest and Researcher-Created Survey for Attitude toward History Class Scale Pretest

		Student Dispositions	
		CM3II+ Pre SR	R-Created Pre SA
CM3II+ Pretest S Rig	Pearson Correlation	1	-.155
	Sig. (2-tailed)	.284	
	N	50	50
R-Created Pre SA	Pearson Correlation	-.155	1
	Sig. (2-tailed)	.284	
	N	50	50

Table 12 illustrates a Pearson's Product-Moment Correlation coefficient analysis that was computed to assess the relationship between CM3II+ pretest scale Scholarly Rigor and researcher-created survey pretest section, Attitudes toward History Class. There was no correlation between the two variables, $r = -.56$, $n = 50$, $p = .284$. A scatterplot summarizes the results (Figure 2). Based on these data, there was no correlation between pretest scores for Scholarly Rigor and pretest scores for Attitudes or Dispositions toward History Class.

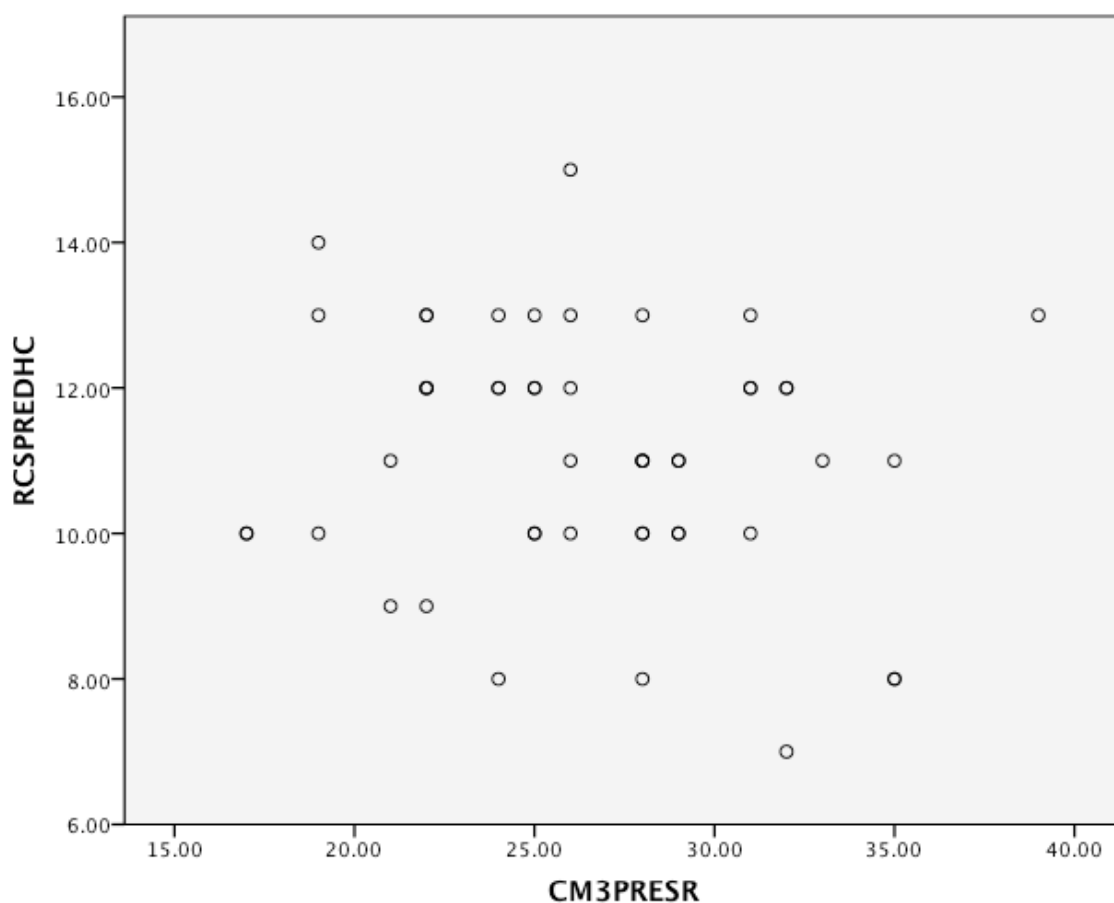


Figure 2. Scatterplot Showing No Correlation between CM3II+ Pretest Scores for Scholarly Rigor and Researcher-Created Pretest Scores for Attitudes or Dispositions toward History Class.

The Figure 2 scatterplots illustrate no clear upward or downward slope from zero and therefore show no positive or negative correlation between variables. In this case, lack of a linear scatterplot shows no correlation between pretest scholarly rigor scores and pretest student attitudes toward history scores (Statistics Help for Students, 2008).

Table 13

Pearson's Product Moment Correlations for CM3II+ Scholarly Rigor Scale Posttest and Researcher-Created Survey for Attitude toward History Class Scale Posttest

		Student Dispositions	
		CM3II+ Pre SR	R-Created Pre SA
CM3II+ Pretest S Rig	Pearson Correlation	1	-.131
	Sig. (2-tailed)		.425
	N	45	45
R-Created Pre SA	Pearson Correlation	-.131	1
	Sig. (2-tailed)	.425	
	N	45	45

Table 13 illustrates a Pearson's Product-Moment Correlation coefficient analysis that was computed to assess the relationship between the CM3II+ posttest scale Scholarly Rigor and researcher-created survey posttest section Attitudes toward History Class. There was no correlation between the two variables, $r = -.13$, $n = 45$, $p = .425$. A scatterplot summarizes the results (Figure 3). Overall there was no correlation between posttest scores for scholarly rigor and posttest scores for attitudes or dispositions toward history class.

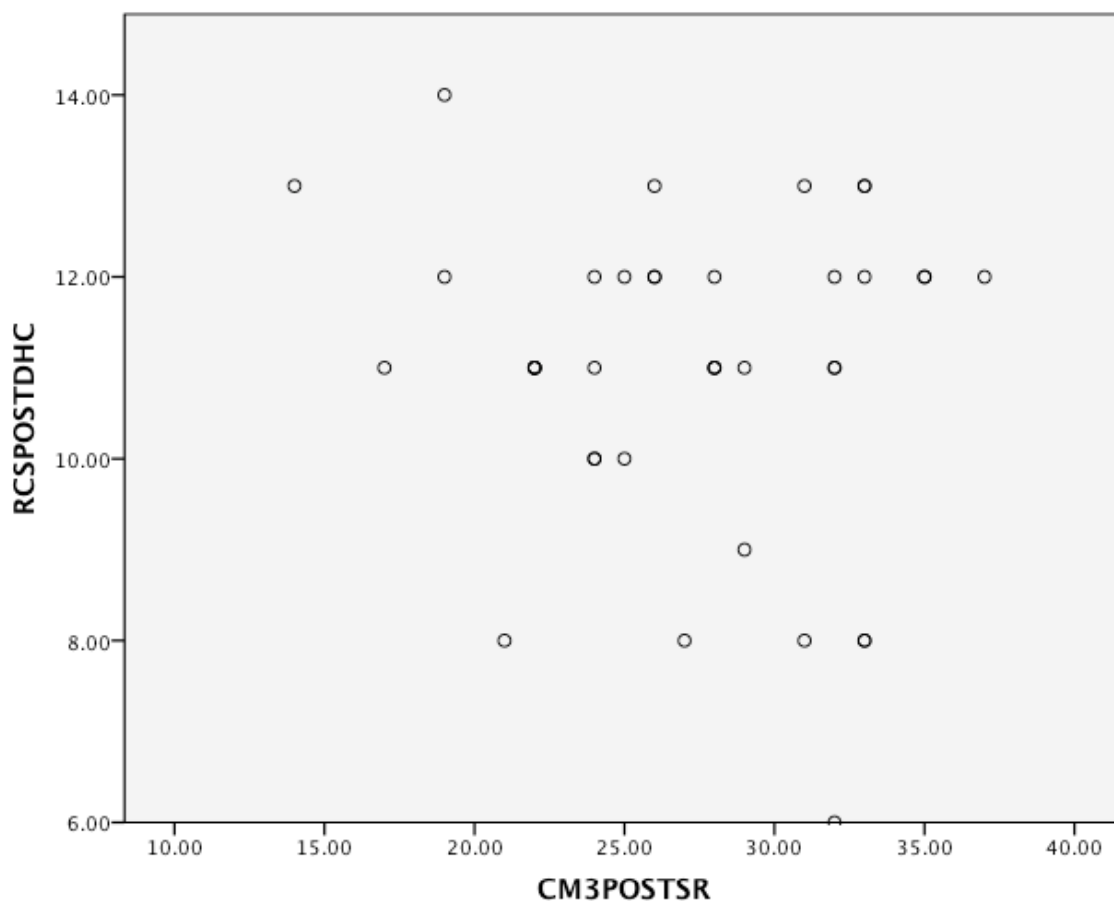


Figure 3. Scatterplot Showing No Correlation between CM3II+ Posttest Scores for Scholarly Rigor and Researcher-Created Posttest Scores for Attitudes or Dispositions toward History Class.

The Figure 3 scatterplots illustrate no upward or downward slope from zero and therefore show no positive or negative correlation between variables. In this case, lack of a linear scatterplot at all shows no correlation between posttest scholarly rigor scores and posttest student attitudes toward history scores (Statistics Help for Students, 2008).

Qualitative Results

Though not the major focus of this study, the qualitative results of the study yielded mixed results as well. In order to ensure fidelity of implementation, the researcher visited the control classrooms to observe the instructions given and when

possible to observe students working. Throughout the 12-week treatment period, the instructor observed the students working daily on each of the inquiry assignments. In addition, the researcher and the instructor met at the beginning and conclusion of the study to discuss their observations. The researcher and the instructor met weekly to discuss progress of the study formally and met almost daily informally.

In the course of the researcher and the instructor discussions, both noted that many of the students seemed engaged in some lessons more than others. It was noticed that students were more on task during those lessons that required the students to work individually. When working in groups, the students were more talkative and the instructor had to repeatedly remind some of them to get back on task.

The inquiry lessons were very challenging for the students, especially the special education students. The researcher observed and the instructor related that many of them had to have the directions explained individually after directions had been given to the whole class. The researcher also noticed that during many of the inquiry lessons, it was often difficult for the instructor to assist each student who needed one-on-one instruction. In the poststudy meeting, the instructor noted students describing the lessons as “hard.” The instructor also related that a few students in both classes asked for help on each question stating that they did not understand. He believed that some of the students wanted him to provide them with the answers if the item was challenging or time consuming.

There were some positive observations by both the instructor and the researcher. When engaging in the lessons that were more sensational or controversial, such as the sinking of the Lusitania or the Atomic Bomb, many of the students asked interesting questions about the subject matter and seemed more interested in the material. The

instructor noted that the students requested less help during these lessons. Overall, the instructor noted that the students were sometimes more engrossed in their task when working on the inquiry lessons than they were when taking notes or answering knowledge-level questions from the online textbook.

Last, both the instructor and the researcher observed students discussing the material with one another on their own and taking contrary viewpoints regarding the issues. Both agreed that the students seemed to delve deeper into the historical materials when challenged with difficult inquiry-based instruction.

Summary

With the exception of the question group “critical thinking methods of instruction,” the data analysis did not support the anticipated outcomes. The reasons for this will be discussed at length in the next chapter. With regard to the first research question, there was no significant effect on eighth-grade student dispositions toward critical thinking after receiving inquiry lessons for 12 weeks. Though certain subscales gained or lost mean points, none of these losses or gains were significant; and in most cases, the scores were relatively constant. The mean points for the subscale Mental Focus showed no change, while the mean points for the subscales Creative Problem Solving and Scholarly Rigor showed a slight increase. Finally, the mean points for the subscales Learning Orientation and Cognitive Integrity showed slight losses.

With regard to the second research question, there was no significant change in eighth-grade student attitudes/dispositions toward their history classes after a 12-week course of inquiry with the exception of the section “critical thinking methods of instruction.” The sections of the researcher-created survey entitled “traditional methods of teaching history” and “attitudes toward history classes” showed no significant increase

or decrease in mean points. Though not significant, the section measuring Traditional Methods of Instruction showed a slight decrease, and the last section measuring attitudes toward history class stayed constant. Interestingly, the section measuring critical thinking methods of instruction showed a slight increase, validating the fact that students recognized an increase in instruction that solves historical problems and answers historical questions. This was substantiated by the qualitative data that demonstrated students were engaged in critical thinking scenarios but did not always know how to enact the process.

Chapter 5: Discussion

Introduction

The overriding purpose of this study was to determine what effect a course of inquiry would have on eighth-grade student dispositions on critical thinking and their history classes. The study sought to answer three research questions.

1. Is there a difference in eighth-grade student dispositions toward critical thinking after exposure to an inquiry model of teaching?
2. Is there a difference in eighth-grade student dispositions toward their social studies classes after exposure to an inquiry model of teaching?
3. Is there a correlation between eighth-grade student dispositions toward critical thinking and eighth-grade student dispositions/attitudes toward their social studies classes?

To conduct the study, the literature review largely focused on the nature of critical thinking and the need to increase critical thinking dispositions in order for students to think critically. In addition, the literature review focused on student attitudes/dispositions toward history and the need for students to be disposed to think critically when engaging in historical thinking. Last, the nature of inquiry as a method of instruction was discussed. Having defined and discussed these elements, the research was conducted. This chapter reports on conclusions and recommendations resulting from this study.

Two survey instruments were utilized and administered pre and posttest to two control classrooms of eighth-grade history students after a 12-week course of inquiry. The first survey was the CM3II+, a four-point Likert survey measuring student dispositions toward critical thinking. This survey instrument was purchased from Insight Assessment (2014). The second survey utilized was a four-point Likert survey created by

the researcher that measured student dispositions/attitudes toward students' history classes. Stanford History Education Group's (2006) Reading Like a Historian provided the course of inquiry lessons. The pretest CM3II+ survey and the pretest researcher-created survey were given followed by 10 Reading Like a Historian lessons over a 12-week period. These lessons were incorporated into the traditional course of study. Upon completion of the 12-week treatment period, the CM3II+ posttest and the researcher-created survey posttest were administered. Data were then collected to address the research problems posed in Chapter 1 of this dissertation. Last, elements of the pre and posttests of both surveys were tested for correlation. The data indicated no significant effect of the inquiry lessons on eighth-grade student dispositions toward critical thinking or toward their history classes. Additionally, no correlation was found between these two dispositions.

This chapter discusses the study through a methodological, pedagogical, and theoretical framework. Limitations to the study such as grouping, sample size, treatment length, time of academic year of the study, student honesty, fidelity of implementation, and the random assignment of groups are discussed. Last, recommendations are made for researchers who are interested in conducting similar studies dealing with dispositions toward critical thinking, dispositions/attitudes toward certain disciplines, and/or the effect of inquiry on teaching and learning.

Anticipated Outcomes

Given the treatment groups' responses to the researcher-created pretest, many of them had received a preponderance of traditional methods of teaching such as lecture and textbook usage prior to eighth grade. It was anticipated that a 12-week course of inquiry would significantly increase student dispositions toward critical thinking. Given that

many had been conditioned to respond positively to rote memorization prior to eighth grade, it seemed that exposing them to inquiry would condition them to respond positively to higher levels of thinking. Although the study did not meet the anticipated outcome in this area, it did reinforce the findings of other studies concerning dispositions toward critical thinking.

The results of this study reinforced Leader and Middleton's (2004) conclusion that development of dispositions takes time. Those studies that included multi-year treatment periods, such as Giancarlo and Facione (2001), Lampert, (2006), and Miri et al. (2007), found significant increases in student dispositions toward critical thinking; while studies utilizing shorter treatment periods yielded results that were less significant (Burns, 2009; Ernst & Monroe, 2006).

Leader and Middleton (2004) also believed that students might learn to detect occasions for critical thinking as a natural habit of mind. These habits of mind (Marzano et al., 1993) must be developed over time through daily reinforcement. Based on observations, the inquiry lessons did help students become more aware of their own thinking, become more accurate in their own thinking, become more open-minded, and work more intensely to solve a task.

Another anticipated outcome was that a 12-week course of inquiry would increase student dispositions or attitudes toward their social studies classes. Student surveys have shown that many students have a negative attitude towards their history classes (Kelly & VanSledright, 2001; Schug et al., 1982). Many attribute this to teacher use of traditional methods in order to cover the copious state standards that teachers are forced to teach in preparation for standardized tests (Doolittle et al., 2005). Again the study did not meet the anticipated outcomes completely. In the researcher-created survey group of questions

that included “critical thinking methods of instruction” questions, there was a significant increase. This reveals that the students recognized that they were engaging in lessons that required them to answer historical questions and solve historical problems more than they had been previous to the pretest survey. This significant result could be evidence that the students were developing “sensitivity to occasion” that Leader and Middleton (2004) identified as the “bottleneck to critical thinking” (p. 3). This study reinforces the idea that students can develop sensitivity to occasion to think critically and once developed, over time, can become more disposed to critical thought.

Methodological Implications

Research Design

A discussion of the methodological implications of the study will begin with the research design. Methodologically, the study utilized a quasi-experimental pretest/posttest design consisting of intact or nonequivalent groups. There are some advantages to this experimental design. The use of intact groups, though seen by some as a weakness, can bring to the study a higher level of authenticity (Bryman & Bell, 2007). The school’s administration and guidance department determined the makeup of the two classes that acted as the treatment group. It was impossible for the researcher to randomly allocate students to the treatment group without disruption of the normal school day but this ensured that the treatment group was not contrived, designed, or artificial. In addition, using intact groups reduces the time and resources needed for experimentation by eliminating prescreening and randomization (Shuttleworth, 2008).

Unfortunately, this research design does introduce threats to internal validity. According to Creswell (2012), threats to internal validity refer to problems in drawing correct inferences about whether the covariation between the presumed treatment variable

and the outcome reflects a causal relationship. In this study's quasi-experimental design, pretests and posttests are utilized and therefore history, testing, instrumentation, design contamination, experimental mortality, maturation, and regression can be a threat to internal validity (Creswell, 2012).

Threats to Internal Validity

This study uses a one-group design model. History is an unanticipated event occurring while the experiment is in progress that can affect the group, or dependent variable (Michael, 2004). History is a threat for the one-group design model. During this study, history was a major issue in that there were so many events that could have affected the dependent variable of the group as a whole. The environment was contained and events were closely monitored; however, this study was conducted during the last 12 weeks of the school year. During these 12 weeks, the students were out of school for 1 week for spring break and many of them returned with a sense that the end of the year was close. Some of the students lost some motivation to work after this date as student fatigue became a factor. In addition, the end-of-year standardized test was given over the course of 3 days in early May. Given that the inquiry lessons were given the last 12 weeks of school, many students may have perceived them as not being part of the standard curriculum and merely "thrown in." Testing may have intensified the perceived irrelevance of the curriculum, in that all units were to be completed prior to the testing dates. Those lessons given after the testing dates may have not been taken seriously or seen as important by the sample group.

This study uses a one-group design model. History is an unanticipated event occurring while the experiment is in progress that can affect the group, or dependent variable (Michael, 2004). History is a threat for the one-group design model. During this

study, history was not an issue as there were no unanticipated events that arose that could have affected the dependent variable of the group as a whole. The environment was contained and events were closely monitored; however, there was no way to control unanticipated events that might have taken place in the personal lives of individual members of the control group.

Testing is another threat to the validity of the pretest/posttest quasi-experiment design. Testing occurs when the pretest scores affect the posttest scores in a pretest/posttest design (Michael, 2004). It is possible the validity of this study was affected in that the CM3II+ pre and posttests and the researcher-created pre and posttests used in the study were identical. The CM3II+ is a very lengthy survey and though it is unlikely that the students remembered each individual item after a 12-week treatment period, the possibility does exist; and even a superficial familiarity with the questions may have changed student responses to the instrument. With this instrument, it is less likely that testing was a factor in the results. However, the researcher-created survey measuring student attitudes contained only 14 items; therefore, it is more likely that student memory could have made familiarity a factor in the results.

Instrumentation is when the instrument between pre and posttest can change, posing a threat to internal validity of the experiment (Creswell, 2012). In this study, it is difficult to determine the extent to which instrumentation affected the study. The Stanford inquiry lessons were not standardized, so the instruments were constantly changing to some extent; however, the basic structure of each lesson stayed the same. This did not affect the pre or posttests. These were standardized, and the students received the same posttest as pretest; so it is believed that instrumentation was a minimal factor.

There are two more internal validity threats to this research design that may have had some impact on the results. Design contamination was evident from pretest to posttest. Insight Assessment had to exclude some student scores on the CM3II+ due to repetition of answers. For example, some students repeated the same answer for every survey item (e.g., a,a,a,a,a,a,a,a,a,a,a,a,a). Others skipped items completely. It is impossible to discern the motive behind these actions, but design contamination could have skewed results to some extent. Some amount of experimental mortality took place. Experimental mortality asks whether or not the same number of students completed the entire study (Michael, 2004). A few of the students did not take the posttest due to absence or during the 12-week treatment period the students were given out-of-school-suspension or were serving in-school suspension. These posttests could not be made up because the posttest was taken at the end of the school year and the students did not return to school following the posttest's delivery.

Maturation is when students develop or change during the experiment and these changes may affect their scores from pretest to posttest (Creswell, 2012). There are two elements of this study that guard against this threat to internal validity. First, the short treatment time, 12 weeks, does not give enough time for maturation to pose a major threat. In addition, all of the students are of the same general age; grade; and to some extent, ability level. This also helps to ensure that maturation is not a major factor in the study's results.

Regression and selection are two threats to internal validity that were not a threat to this study. Regression is when a researcher chooses individuals for a group based on extreme scores (Creswell, 2012). This could not affect the study due to the fact that the study used intact groups and students were not selected using any particular criteria.

Selection refers to “people factors” that might introduce threats that influence the outcome of the experiment (Creswell, 2012). Creswell (2012) recommended that random selection can partially address this threat. Again, using intact groups minimized any chance that selection would be a factor in the study.

Threats to External Validity

In every research design, there are threats to internal validity. In addition to this, there are also threats to external validity. Creswell (2012) explained threats to external validity as “problems that threaten our ability to draw correct inferences from the sample data to other persons, settings, treatment variables, and measures” (p. 306). The threats to external validity that were pertinent to this study include interaction of selection and treatment and interaction of history and treatment.

Interaction of selection and treatment is defined by Creswell (2012) as “the inability to generalize beyond the groups in the experiment, such as other racial, social, geographical, age, gender or personality groups” (p. 306). This study utilized intact or nonequivalent groups. As mentioned previously, the two teams of eighth-grade students were carefully grouped by team and by individual classes by the administration and the guidance department. They try to maintain a balance between teams with regard to gender, ethnicity ratio, number of special education students, discipline history, and behavior. They also try to assign to each team an equal number of students and an equal number of advanced and regular classes, if possible (Anonymous, personal communication, February 26, 2016). Taking this factor into account, these randomly selected students are very diverse. The two “regular” classes selected for the study include a variety of ability levels, personality types, ethnicities, and both genders. This ensures some external validity as far as being able to compare findings to other groups of

a similar grade, age, and ability level.

Interaction of history and treatment is the second threat to external validity that was pertinent to this study and is defined in Creswell (2012) as “when the researcher tries to generalize findings to past and future situations” (p. 306). This was the greatest threat to external validity of this study. The treatment period took place during the last 12 weeks of the school year. The study might have achieved significant results if conducted at the start of the school year. Had the study taken place at the start of the school year, the inquiry lessons would have been integrated into the daily plans in such a way as to make them seem like a component of the normal course of study. Because the inquiry lessons were integrated into the normal course of study three fourths of the way through the school year, student perceptions toward these lessons could have been that they were inauthentic. Imposing a new strategy at this late date in the school year could have led to negative attitudes on the posttest. Student fatigue at this time of the year could account for the mean score concerning student attitudes toward history class staying constant at 11 from pretest to posttest. The end of the school year is a very chaotic time involving standardized testing and spring break. These events involve major disruptions of the schedule and could have had an effect on student mean scores. Because the state standardized tests, which take days to complete, and the weeklong spring break are scheduled each year close to the end of the school year, many students may not have taken the posttests seriously as they are anticipating summer break. The instructors are encouraged to finish the curriculum prior to state standardized testing. Though instruction continues weeks after testing, the academic year when this study was conducted, no exams were given. It is possible that many of the students perceived the standardized testing as marking the end of the year. Indeed, the instructor involved in

this study observed a marked disinterest in classwork among some students after spring break and particularly after standardized testing was completed. The high numbers of students who marked repetitive answers on the posttest surveys or did not mark certain items at all could be evidence of this fatigue and disinterest.

Based on prior studies, the length of treatment for this study may have played a role in the lack of significant results. Leader and Middleton (2004) found that development of attitude strength takes time; and those studies that included a lengthy treatment period (Giancarlo & Facione, 2001; Lampert, 2006; Miri et al., 2007) found more significant results than those studies that used a shorter length of treatment (Bers et al., 1996; Burns, 2009). Based on responses to the first five pretest questions on the researcher-created survey measuring student attitudes toward history classes, many of them have spent significant time in past history classes engaged in bookwork, lectures, notes, and worksheets. At the start of the study, 47% of the students agreed or strongly agreed that their social studies classes primarily used textbooks during instruction. Eighty-two percent agreed or strongly agreed that worksheets were primarily used during instruction. Ninety-percent agreed or strongly agreed that note taking and lecture were primarily used during instruction. Sixty-four percent agreed or strongly agreed that they primarily memorized facts during instruction in their social studies classes. The posttest only showed a significant decrease when asking if the social studies classes primarily used lecture. Ninety percent of the students responded on the pretest that lecture was primarily used in their social studies classes. After the treatment of inquiry lessons for 12 weeks, the percentage dropped to 80%. With the exception of lecture, there was insubstantial decrease or increase. Given these responses, it is probable that a multi-week study is inadequate to show substantial differences in student dispositions. Based on this

study and those mentioned above, multi-year studies yield more substantial results. If students in social studies classes have primarily been conditioned to respond to direct instruction for a number of years, it may be unrealistic to expect significant changes in disposition in 12 weeks.

Pedagogical Implications

Active versus passive learning. With the exception of student attitudes toward critical thinking methods of instruction, the study did not find significant quantitative effects on student dispositions toward critical thinking or the students' history classes. However, from a qualitative standpoint, observations were made that suggest that teachers and students would benefit from implementing a course of inquiry. During formal meetings and informal discussions during the course of the study, the instructor pointed out that students were more actively engaged in the inquiry lessons than they were with traditional methods of instruction. He reported hearing complaints when the students found out that they were going to take notes or read from the book. Neither the researcher nor instructor heard such complaints when inquiry lessons were introduced. The researcher and instructor observed that most of the students were busier and authentically engaged while completing the inquiry lessons. Based on this study, teachers and school districts wishing to implement a program of inquiry will find that this program encourages active learning as opposed to the passiveness of notes and textbook reading.

Teacher-centered learning versus student-centered learning. Often, history teachers engage in lectures or textbook reading while students sit passively and listen. It is this kind of instruction that caused many students to have negative views of history classes (Trei, 2004). One of the things the instructor enjoyed most about the inquiry

lessons was that he was able to act more as a facilitator than a transmitter of historical information. The instructor stated that he gained a certain satisfaction with watching the students become problem solvers as opposed to direction followers. The inquiry lessons transferred much of the responsibility of the learning from the teacher to the student. Once the lessons were introduced, it was the teacher's responsibility to move around the room and help those students in need or to encourage students to stay on task. It was the students' responsibility to gather information from sources that included contrary points of view. From these sources, the students then formed their own positions. This is a complete reversal of the traditional role of teacher and student in many history classes. Most of the students seemed to react positively to taking responsibility for their own learning and gaining a measure of intellectual autonomy and confidence. This study reinforced Martin and Wineburg's (2008) contention that history students should go beyond rote memorization and practice historical thinking. The researcher and the instructor observed that students seemed excited when they made an historical discovery independently, as opposed to having the answer given to them. This benefit of a course of inquiry for middle school students is similar to the benefit that Levy and Murnane (2005) found among college students. When the students developed their own ideas or made their own discoveries, it fostered a student's sense of intellectual freedom, personal authority, and identification with their academic or professional discipline.

Implementation of a Course of Inquiry

This study reinforces the findings of previous studies that it takes time to develop critical thinking dispositions in students. Those studies with longer treatment periods (Giancarlo & Facione, 2001; Leader & Middleton, 2004; Lampert, 2006; Miri et al., 2007) found significant quantitative results, while quantitative results for this study and

others (Bers et al., 1996; Burns, 2009) that had shorter treatment periods were insignificant. These results inform the researcher that teachers, schools, or districts wishing to implement a course of inquiry must exercise patience. In addition, teachers and researchers must implement the inquiry lessons at the beginning of the school year and continue them throughout the school year. Approximately half of the eighth-grade social studies students who participated in this study indicated that they had received mostly traditional methods of instruction such as textbooks, worksheets, notes, lecture, and memorization of facts. For students who have received primarily traditional methods of instruction for 7 years of their school experience, a 12-week treatment period is inadequate to affect change resulting in significant results.

Group or Individual Inquiry

Qualitative results were positive for most of the studies but were based solely on observation. The problem with observation is that it cannot be easily discerned whether the students were displaying increased dispositions/attitudes toward critical thinking and/or their history classes due to the inquiry lessons or some other factor such as being able to work in groups with friends.

Both the researcher and the team teacher observed enthusiasm among the students when working in groups more so than when working individually. This would seem to indicate that the increased enthusiasm and confidence in doing the work was based more on the fact that the students were allowed to work with others and therefore was based on social factors. The teacher in this study had no particular criteria for forming collaborative groups. The teacher wishing to implement a program of inquiry should group students within the class in a way that discourages socializing as much as possible and encourages students to stay on task. According to Brame and Biel (2015), informal

cooperative grouping consists of small, informal, ad hoc groups that work together to answer questions or respond to prompts from the instructor. The instructor in this study used informal cooperative groups. It is possible that the lack of structure, which included allowing the students to choose their own groups, led to a visible increase in positive attitude but for the wrong reasons. During inquiry lessons where students worked independently, both the teacher and the researcher observed most of the students staying on task. During lessons when the students worked in informal groups, there was more socializing and the students had to be encouraged to stay on task more often. Researchers replicating this study or teachers implementing a course of inquiry should use formal cooperative groups. Regular eighth-grade classes consist of a wide range of students with a range of maturity levels. Some of them require more structure than others. According to Brame and Biel, formal cooperative groups are characterized by

- Instructor defines the learning objective;
- Instructor-assigned, heterogeneous groups;
- Particular attention is paid to skills needed for success in the task;
- Assignment of specific roles within the groups;
- Communication by the instructor of the criteria for success and the types of social skills that will be needed;
- Instructor plays an active role during the groups' work, monitoring, and evaluating group and individual performance; and
- Instructor encourages groups to reflect on interactions to identify potential improvements for future group work.

This study's informal cooperative group structure included some of the elements listed

above, such as defining the learning objective, which were built in to the inquiry lessons and monitoring of groups to evaluate individual and group progress.

Nine inquiry lessons were included in the regular course of study. It is possible that nine lessons in a 12-week treatment period were excessive. The short treatment period could have possibly caused the researcher to include an overly ambitious number of inquiry lessons. These lessons require more thought and effort than many traditional lessons and trying to cover too much material could have had the opposite effect than increasing dispositions toward critical thinking and history classes. Teachers and future researchers, besides increasing the length of treatment period, should include a realistic number of inquiry lessons. The lessons chosen to be included in the study proved to be difficult and frustrating for some of the students. According to Allington (2005), the average student in secondary classrooms reads below grade level and some of the lessons included in this study required large amounts of reading and writing. Teachers and researchers need to encourage students to think deeply but also must be careful not to overreach when implementing the lessons. A related factor with these lessons was the time of year of the study. The SC PASS standardized test was given toward the end of the 12-week treatment period. The teacher involved in the study stated that he felt “rushed” to get through the material so he could get to the notes where facts that would be on the PASS test were located. A longer treatment period will give educators and researchers time to implement the material effectively. It will allow the students time to work with less frustration and the instructor will have time to give aid to frustrated individuals and groups. Finally, by implementing the program of inquiry earlier in the school year, the teacher/researcher will be able to create long-range plans to deal with holidays, state testing, and unforeseen interruptions to the school schedule.

Pedagogically, it takes time to implement an effective course of inquiry. The most effective courses of inquiry tend to last at least a year with multi-year courses having the best result. For classroom teachers and researchers utilizing collaborative groups, formal collaborative grouping provides the most structure for “regular” students at this level to minimize social distractions. Inquiry requires higher level thinking and adequate time must be allotted for students who have various abilities to complete the lessons without frustration. Frustration can have the opposite effect of increasing dispositions. Implementing the program of inquiry at the start of the year will help to minimize disruptions from planned and unplanned events that disrupt the school schedule.

Theoretical Implications

The genesis of this study sprang from my own experience as a classroom teacher. I have always believed the most effective way to teach my history classes was through allowing students to be more than passive listeners and absorbers of facts and instead become historians for the approximately 36 weeks they are with me. Each year at the beginning of the school year, when the students receive their first inquiry-based classwork assignment, student hands are immediately raised. Like Lesh (2011), I found that many students wanted me to give them the answers and they had no interest in finding the answers themselves. These ambivalent and in some cases negative dispositions or attitudes toward critical thinking caused me to think about whether or not inquiry would improve these dispositions.

The theoretical implications of the study are that many of these eighth-grade students have been conditioned to learn by rote memory. Table 14 illustrates that except for textbook usage, which was still 47% of the 50 eighth-grade social studies students

who responded to the teacher-created survey, 64-90% felt that they primarily used worksheets, took notes, listened to lectures, and memorized facts. Conversely, students who cited using projects, using independent and group research to answer historical questions or to solve historical problems, ranged from 41-72%. Though some students are being engaged in problem-based, higher level thinking types of instruction, the majority is still being conditioned to learn history through primarily traditional methods of instruction. As discussed earlier in this study, it takes time for a program of instruction to have an effect on dispositions. This is especially true if the students have been conditioned to memorize through traditional methods of teaching year after year.

Table 14

Pretest Researcher-Created Survey Questions 1-10 and Percentage of Student Responses

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
My social studies classes primarily used textbooks during instruction.	10.20%	36.73%	42.86%	10.20%
My social studies classes primarily used worksheets during instruction.	50.00%	32.00%	16.00%	2.00%
My social studies classes primarily used note-taking during instruction.	70.00%	20.00	8.00%	2.00%
My social studies classes primarily used lecture during instruction.	46.00%	44.00%	8.00%	2.00%
In my social studies classes we primarily memorized facts during instruction.	20.00%	44.00%	30.00%	6.00%
My social studies teacher primarily used projects as history instruction.	4.00%	44.00%	38.00%	14.00%
In my social studies classes we primarily used independent Research to answer historical questions.	32.00%	40.00%	24.00%	4.00%
In my social studies classes we primarily used independent research to solve historical problems	22.00%	50.00%	20.00%	8.00%
My social studies classes primarily used group research to answer historical questions.	8.00%	38.00%	40.00%	14.00%
My social studies classes primarily used group research to solve historical problems.	6.12%	34.69%	48.98%	10.20%

Repetition is one of the earliest forms of learning. According to Weibell (2011), Aristotle in ancient Greece stated, “it is frequent repetition that produces a natural tendency and the more frequently two things are experienced together, the more likely it will be that the experience or recall of one will stimulate the recall of the other” (para. 1). It is entirely possible that when some students receive an assignment in class, they

perceive that assignment as just another worksheet asking them to peruse a book for facts to recall on the test. However, when they realize that they are being asked to compare points of view or draw conclusion of their own for example, they do not have the disposition to do so due to repeated reinforcement and repetition of a particular form of thinking. In order to change this disposition toward rote memorization, students must be conditioned to think in other ways. They must develop certain habits of mind that are in contrast and even conflict with the way they learn in traditional social studies classroom environments.

Through repeated pairing of a conditioned stimulus and an unconditioned stimulus, Ivan Pavlov was able to condition a reflex to be triggered by the conditioned stimulus (Weibell, 2011). Edward Thorndike conducted research on animals using puzzle boxes and found that an animal makes a response; and when rewarded, the response is learned. If the response is not rewarded, it eventually disappears. He called this the “Law of Effect” (Reinemeyer, 1999). Watson extended the work Pavlov and Thorndike did on animals to the experimental study of humans. He identified repetition as one of the factors that establishes a habit (Weibell, 2011). Based on studies concerning student attitudes toward social studies (Kelly & VanSledright, 2001) and this study, I believe many social studies teachers have conditioned their students to rely primarily on rote memorization. A certain amount of base knowledge is necessary in a history class (Ciciora, 2009); however, when the students have been conditioned to respond with requests for answers and the expectation of memorizing a collection of facts until it has become habit, they have little inclination to seek answers themselves. They have not actively engaged and are unfamiliar with the thinking necessary to engage in a critical approach to learning social studies. It was hoped that a course of inquiry would

encourage the students to apply the base knowledge by solving historical problems or answering historical questions. By entering “deeper learning,” the process of fusing content knowledge and real-world situations, students will transfer knowledge rather than memorize it (Towler, 2014).

If some of these eighth-grade history students have been conditioned to respond primarily to rote memorization and other traditional methods of instruction, how do we help them to respond positively to inquiry? We assist the students in developing mental habits that encourage them to learn on their own whatever they need or want to know (Marzano et al., 1993). Marzano et al. (1993) identified five dimensions of learning. The fifth-dimension is productive habits of mind. The first is self-regulated thinking and learning. This habit of mind consists of being aware of your own thinking. This can help students figure out themselves what they are doing wrong when working on a task. This habit of mind also includes planning and being aware of necessary resources. Neglecting to plan ahead and not having the necessary resources limits the students’ performance. Being sensitive to feedback and being able to evaluate the effectiveness of their actions assists the students in preventing careless mistakes and learning from mistakes when they are made. The second habit of mind is critical thinking and learning. This habit of mind includes seeking and being accurate when completing a task that requires precision. Being open-minded and resisting impulsivity teaches the student to be less dismissive of new ideas and to think before being so quick to respond. This habit of mind aids the student in being confident about taking positions yet to be taken by others and being sensitive to other people’s positions. The last of Marzano’s (2003) habits of mind is creative thinking. This habit of mind encourages students to engage intensely in a task when answers are not immediately apparent. It prompts students to push the limits of

their knowledge and ability and to trust their own standards of evaluation and to look at a problem from a different perspective.

The inquiry lessons teach some of the habits of mind by their very nature, such as critical and creative thinking; but in order to change student dispositions, teachers must encourage habits of mind, such as self-regulated thinking and learning, daily in their classrooms. Theoretically, forming and strengthening these habits of mind will make the students more receptive to inquiry and increase dispositions, balancing the habits of mind with the students' habits of relying on rote memorization. At the same time, it is hoped that by learning and strengthening these habits of mind, and as students gain confidence by becoming more effective at inquiry, their dispositions/attitudes toward history class will improve. All conditioning takes time. It took years of conditioning for the students to form traditional learning habits that limit their dispositions to think critically. It stands to reason that it would possibly take months or years to condition them to form these habits of mind. This exposes the core of the weakness of this study. The treatment must be long enough to effectively condition the students to form habits of mind and positive dispositions.

Limitations

This study presents several limitations. The first is sample size. The sample size of the study was limited by budget constraints. The cost of purchasing the CM3II+ was prohibitive, yet this is the only test the researcher was aware of that specifically targets secondary education student dispositions toward critical thinking. According to Marley (2016), larger sample sizes give more reliable results with greater precision and power, but they also cost more time and money. The number of students who skipped survey items or gave repetitive responses that invalidated their posttest scores and further

lowered the sample size exacerbated this limitation.

The length of treatment could have had an effect on the outcome of the study. Leader and Middleton (2004) found development of attitude strength takes time, and those studies that included a lengthy treatment period (Giancarlo & Facione, 2001; Lampert, 2006; Miri et al., 2007) found more significant results than those that included shorter treatment periods (Bers et al., 1996; Burns, 2009). Based on responses to the researcher-created survey, many social studies students have spent 7 years engaged in bookwork, lectures, notes, and worksheets that do not challenge them to think critically. It is probable that a multi-week study is not substantial enough to cause significant differences in some students' dispositions. If it takes years to condition students to memorize and respond to direct instruction, it is probable that it would take a multi-year practice of inquiry to positively dispose students to higher level thinking instruction.

A third limitation to this study is the time of year when the study was conducted. By the time the proposal defense was concluded and the study could go forward, most of the school year was completed. The 12-week treatment period comprised part of the third 9-week grading period and all of the last 9-week grading period. Based on researcher/teacher observation and the number of students who skipped items or wrote the same response for every question and thus did not take the survey seriously at posttest, some of the students were fatigued and ready for the school year to end. If the study is not a multi-year study but one year or less, it is recommended that the researcher complete the posttest early in the year before end-of-year fatigue sets in among the sample group.

Student honesty is another study limitation. With all surveys, the results rely on honesty. It cannot be guaranteed that all of the students answered the survey items

truthfully and objectively. Based on skipped and repetitive items on the posttest survey results for both the CM3II+ and the researcher-created survey, some students were dishonest in their survey responses. The sample students were contained in the same room and all were given the pre and posttests at the same time. Though the environment was distraction-free and unlimited time was given for completion of the surveys, having all of the students in the same room while administering pre and posttests could have proved a distraction for some.

Fidelity of implementation may have been an issue when introducing the Stanford inquiry lessons. Steps were taken to minimize this limitation as much as possible by observing the instructions being explained by the teacher included in this study. However, the presence of the researcher in the class may have proved to be a distraction for some students. The lessons include meticulous instructions and are not open to much interpretation by the teacher delivering the instruction. Although it changes the dynamic of the classroom, the presence of the researcher was needed to ensure that the teacher did not go “off script” and to ensure that instructions were delivered as written. Of course, this cannot guarantee fidelity of implementation fully, and the researcher was unable to stay in the teacher’s room for the entire lesson. A certain amount of trust in the classroom teacher had to be given to ensure that the lessons were executed as they were intended.

The sample students included in the study could be a limitation. The study was quasi-experimental (Creswell, 2012) because random assignment of the sample groups would have resulted in a disruption of the learning process; therefore, intact groups were utilized. This means that students could not be grouped based on any particular characteristics. Both eighth-grade classes contained students with a wide range of ability

levels; and the guidance department and administrators attempted to keep a balance between teams in regard to gender, ethnicity ratio, and number of special education students; however, the researcher was prohibited from altering the sample groups or grouping the sample in any way.

In broad terms, there are many variables that affect dispositions such as too many standards, the nature of the content, instructor delivery, planned and unplanned interruptions, foreseen and unforeseen events in the lives of the sample group, time of school year, types of grouping, and student honesty. Though some could be controlled, the researcher could not control all of the variables that affected this study.

Recommendations

The results of this study recommend further research. Though there are no other studies that specifically seek to find out what effect inquiry has on eighth-grade dispositions, there are studies that suggest that specific instructional methods can have a positive effect on student dispositions toward critical thinking given an adequate treatment period. As discussed in the literature review, students are often not encouraged or disposed to use critical thinking skills. Further research is warranted to determine what methods of instruction are most effective and to what degree. When we find those methods of instruction that work best in increasing student dispositions toward critical thinking, we can implement these in the classroom and help our young people compete in the world of higher education and the 21st century workforce.

There are few recent studies that gauge student attitudes toward history class and few that investigate whether or not a course of inquiry will have an effect on eighth-grade student attitudes/dispositions toward history classes. Schug et al. (1982) and Kelly and VanSledright (2001) found negative attitudes toward history class with the students using

terms such as “boring,” “uninteresting,” and “irrelevant.” Like these studies, many sample students in this study responded positively to these negative responses on the researcher-created survey pre and posttests. There was little or no significant change in student attitudes pre to posttest after a course of inquiry. This is a neglected area of study with a gap in the literature concerning student attitudes toward history class and whether or not they can be improved with specific methods of instruction. It is recommended that more studies be conducted in an effort to find methods of instruction that can make history more exciting and relevant for students.

It was decided to pursue Research Question 2 as an outgrowth of Research Question 1. If student dispositions were increased to any extent, was it because of a positive attitude toward critical thinking or was it a consequence of engaging in something other than traditional methods of teaching history? The third research question asked whether there was any correlation between dispositions toward critical thinking and dispositions toward history class. There were no previous studies that investigate this question and no correlation was found. The lack of studies warrants further investigation in this area with a larger sample group, a longer treatment period, and an earlier treatment window.

Further studies of any of the three research questions included in this study must utilize a larger sample size of students. The researcher must take into account the fact that some students may drop out of the study for a myriad of reasons, and some may not take the surveys seriously, lowering the sample numbers. In addition, it is recommended that future researchers conduct research on groups of students such as gifted and talented students and advanced classes as well as regular classes. These studies should be conducted over a course of years as opposed to months, if possible, to yield more

significant results.

This study focused primarily on quantitative research and utilized informal observation as the qualitative component. Past studies achieved significant results through qualitative research as opposed to quantitative research (Leader & Middleton, 2004; Warren et al., 2004). It is recommended that future researchers conduct thorough qualitative studies that utilize student and instructor interviews, formal observations, etc.

This study focused on dispositions as attitudes; however, Goleman (1995) and Ritchart (2014) concentrated on the importance of emotions in developing dispositions. They maintained that emotions lay the groundwork for any thinking that is to come and the importance of controlling these emotions. It is recommended that future studies concentrate on the role of emotions and how they affect student dispositions. Finally, more future research should be conducted on middle school students. Of all of the grade levels included in the studies of student dispositions, these groups of students are the most underrepresented.

Summary

The results of this study were contrary to the anticipated outcomes that a course of inquiry would improve dispositions. Several factors discussed could have impacted the results such as sample size and treatment period. The findings were mixed with some subscales and sections remaining constant, some slightly improved, and some slightly decreased; however, none of the subscales and sections showed significant differences. In addition, no correlation was found between dispositions toward critical thinking and dispositions toward history class. The results show that further studies are needed concerning whether or not particular instructional methods, such as inquiry, have any effect on student dispositions toward social studies learning.

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Appendix A

Researcher-Created Survey Measuring Eighth-Grade Student Dispositions toward History Classes

Survey Measuring Eighth-Grade Student Dispositions toward Social Studies Classes

1. My social Studies classes primarily used textbooks during instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

2. My social studies classes primarily used worksheets during instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

3. My social studies classes primarily used note-taking during instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

4. My social studies classes primarily used lecture during instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

5. In my social studies classes we primarily memorized facts during instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

6. My social studies teacher primarily used projects as history instruction.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

7. In my social studies classes, we primarily used independent research to answer historical questions.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

8. In my social studies classes, we primarily used independent research to solve historical problems.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

9. My social studies students primarily used group research to answer historical questions.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

10. My social studies classes primarily used group research to solve historical problems.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

11. My social studies classes were boring.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

12. My social studies classes were interesting.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly Disagree

13. My social studies classes were important.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

14. My social studies classes were exciting.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

Appendix B

Correspondence with Insight Assessment Regarding Use of CM3II+ Sample Questions

Friday, January 29, 2017 10:47 AM CDT (GMT-5 Standard Time)

Subject: RE: sample survey

Date: Thursday, November 10, 2016 1:08:35 PM Eastern Standard Time

From: [REDACTED]

To: Michael Bolling

Hi Michael,

You can use anything found online on our website or anything in the user manual. Unfortunately we do not have any specific sample questions for the CM3 II+. There are a few generic sample questions on the website. Let me know if you have any further questions.

Best Wishes,

[REDACTED]

Customer Relations Specialist

Insight Assessment

650-697-5628

[REDACTED]

www.insightassessment.com

From: Michael Bolling [mailto:MBolling@rhmail.org]

Sent: Thursday, November 10, 2016 8:25 AM

To: [REDACTED]

Subject: sample survey

[REDACTED]

Is it possible to procure some type of sample survey that can be included in my dissertation? In chapter 4 where I discuss the CM3II+ it would be helpful to have a few sample questions or something to refer to in the appendix.

Please let me know if there is anything available. I understand the confidentiality of the survey itself and will allude to that when I cite the sample.

Thanks,

Mike