High school students' experiences with social studies inquiry and technology in two history classrooms

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ABSTRACT

HIGH SCHOOL STUDENTS’ EXPERIENCES WITH SOCIAL STUDIES INQUIRY AND TECHNOLOGY IN TWO HISTORY CLASSROOMS

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Northern Illinois University, 2018
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This dissertation was a case study of student perceptions in two history classrooms in a large suburban high school. In each classroom examined for this study the teacher was committed to using social studies inquiry and mobile technology in their instruction. Students were also expected to complete assignments and conduct inquiry with mobile technology. The purpose of this study was to examine the voice and experiences of high school students, and how high school students construct meaning through inquiry and mobile technology in the social studies classroom. 109 students participated in observations, focus groups, personal interviews and submitted completed examples of inquiry with technology. There were four general themes uncovered in the data for this study. The four themes that generated the findings for this study are that students engaged in inquiry using mobile technology (a) embraced the availability of resources and information when planning and conducting inquiries (b) reflected on communication with teachers and peers during the inquiry process (c) expressed that mobile technology provided opportunities to engage in learning and enhance knowledge outside of prescribed assignments (d) and used various creative outlets of mobile technology to communicate outcomes.
HIGH SCHOOL STUDENTS’ EXPERIENCES WITH SOCIAL STUDIES
INQUIRY AND TECHNOLOGY IN TWO
HISTORY CLASSROOMS

BY

AARON PHILLIPS
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
DOCTOR OF EDUCATION

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Doctoral Director:
Mary Beth Henning
ACKNOWLEDGEMENTS

Many individuals contributed their expertise, their time, gave support, or opened their classrooms for this project. I would first like to thank my dissertation director Dr. Mary Beth Henning, whose guidance, support, and patience were needed for the completion of this project. By sharing her knowledge of social studies inquiry, I have a deeper understanding of its implications in learning and for the future of social studies education. I would also like to thank Dr. Euikyung Shin and Dr. Michael Manderino for agreeing to work on my dissertation committee, and also providing their unique insight into both social studies inquiry and technology. Dr. Shin also gave her time and expertise in the early stages of this project when my dissertation director was on sabbatical, and without her help this research may not have started when it did. Many people employed at the school where this study was conducted provided access and time and they deserve to be acknowledged. The two teachers that participated in this study willingly opened their doors and offered their time and support throughout, and for that I am grateful. They are not only supportive colleagues, but excellent teachers. Finally, I would like to acknowledge my family whose support was unwavering throughout the long journey to complete my degree. My wife, whose devotion and support are always admired and deeply appreciated. My mother, whose life-long example has steered my desire to achieve and modeled how to embrace challenges. And, my three children, who continue to amaze and inspire me every day.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>List</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>vi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>viii</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>1. Introduction to Study</td>
<td>1</td>
</tr>
<tr>
<td>Conceptual Framework</td>
<td>4</td>
</tr>
<tr>
<td>Problem and Purpose</td>
<td>9</td>
</tr>
<tr>
<td>Research Questions</td>
<td>11</td>
</tr>
<tr>
<td>Methodology</td>
<td>12</td>
</tr>
<tr>
<td>Delimitations</td>
<td>12</td>
</tr>
<tr>
<td>Significance of Study</td>
<td>13</td>
</tr>
<tr>
<td>Definitions</td>
<td>14</td>
</tr>
<tr>
<td>Organization of Study</td>
<td>15</td>
</tr>
<tr>
<td>2. A Review of the Literature</td>
<td>16</td>
</tr>
<tr>
<td>Social Studies Inquiry</td>
<td>16</td>
</tr>
<tr>
<td>Technology in the Social Studies</td>
<td>32</td>
</tr>
<tr>
<td>Student Voice Research</td>
<td>42</td>
</tr>
<tr>
<td>Conclusion</td>
<td>52</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>3. METHODOLOGY</td>
<td>53</td>
</tr>
<tr>
<td>Introduction</td>
<td>53</td>
</tr>
<tr>
<td>Research Questions</td>
<td>53</td>
</tr>
<tr>
<td>Research Design</td>
<td>54</td>
</tr>
<tr>
<td>The Case</td>
<td>56</td>
</tr>
<tr>
<td>Data Collection</td>
<td>62</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>67</td>
</tr>
<tr>
<td>Conclusion</td>
<td>72</td>
</tr>
<tr>
<td>4. FINDINGS</td>
<td>73</td>
</tr>
<tr>
<td>Students Embraced the Availability of Resources and Information When Panning and Conducting Inquiries</td>
<td>74</td>
</tr>
<tr>
<td>Students reflected on Communication with Teachers and Peers During The Inquiry Process</td>
<td>77</td>
</tr>
<tr>
<td>Mobile Technology Provided Opportunities to Engage in Learning and Enhance Knowledge Outside of Prescribed Assignments</td>
<td>82</td>
</tr>
<tr>
<td>Students Used Various Creative Outlets of Mobile Technology to Communicate Outcomes</td>
<td>87</td>
</tr>
<tr>
<td>Conclusion</td>
<td>91</td>
</tr>
<tr>
<td>5. DISCUSSION AND CONCLUSION</td>
<td>93</td>
</tr>
<tr>
<td>Overview of Study</td>
<td>94</td>
</tr>
<tr>
<td>Limitations</td>
<td>95</td>
</tr>
<tr>
<td>Summary of Findings</td>
<td>96</td>
</tr>
<tr>
<td>Recommendations for Future Research and Practice</td>
<td>108</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
</tr>
<tr>
<td>Conclusion</td>
<td>114</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>117</td>
</tr>
<tr>
<td>APENDICES</td>
<td>132</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Four Dimensions of the C3 Framework</td>
<td>5</td>
</tr>
<tr>
<td>2. The Three Primary Models of Inquiry</td>
<td>6</td>
</tr>
<tr>
<td>4. The Characteristics of Social Studies Inquiry and Historical Inquiry</td>
<td>30</td>
</tr>
<tr>
<td>5. Data Collection Tools, Timeline, and Research Questions</td>
<td>63</td>
</tr>
<tr>
<td>6. The Integration of the New Learning Ecology and the Dimensions of the C3 Framework with Findings in the Study</td>
<td>107</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The new learning ecology in 1:1 settings</td>
<td>8</td>
</tr>
</tbody>
</table>
LIST OF APPENDICES

Appendix                                  Page

A.  OBSERVATION PROTOCOL USED FOR THIS STUDY ..................................   132
B.  EXAMPLE OF OBSERVATION NOTES                                      134
C.  FOCUS GROUP PROTOCOL USED FOR THIS STUDY                            135
D.  INTERVIEW PROTOCOL USED FOR THIS STUDY                              138
E.  QUESTIONS ASKED OF TEACHER PARTICIPANTS DURING MEMBER CHECKING OF DATA ........................................................................................................ 141
F.  PHOTOS OF STUDENT WORK FOR 20TIME AUTOMOBILE PROJECT .................................   143
G.  “JEREMANY” WEBPAGE FOR 20TIME PROJECT ......................................   145
H.  MAP OF EUROPE RISK GAME 20TIME PROJECT .....................................   147
I.  REVOLUTIONARY JOURNAL 20TIME PROJECT ..........................................   149
American students are immersed in a digital age, and many organizations like the Partnership for 21st Century Learning and the International Society for Technology in Education (ISTE) encourage a technology rich educational environment. According to the ISTE (2013), an advocacy group that encourages increased technology in the classroom, students need to be able to use technology to “analyze, learn, and explore” (p. 1). According to the ISTE, students need to use technology productively in the classroom to enhance their learning and understanding of all disciplines, and this is best when they embed technology into a creative intellectual process. The ISTE defines technology as any digital tools that enable students to explore, share, and manipulate data, as well as create and collaborate on outcomes (ISTE, 2013).

The National Council for the Social Studies (NCSS) has also encouraged an increased use of technology in social studies education. In its 2013 position statement on technology, the NCSS challenged social studies educators to prepare “digital citizens within a global setting” (para 16). The NCSS asks that students become “media literate” in digital and online worlds that have “democratized the dissemination of knowledge online” (NCSS, 2013, para 5 & para 11). Despite the recent calls for use of digital technology, research has suggested that technology is used marginally in the classroom.

In 2010, the National Center for Education Statistics reported that nearly all classrooms have at least one computer for instructional use, but only 40% of teachers stated
that they used the technology regularly (Gray, Thomas, & Lewis, 2010). Thus, the term instructional use has historically implied teacher-centered use of computers and digital technology, not engaged use by students (Cuban, 2006; Gray et al., 2010). Too often financial costs, and access, as teachers must book use in labs and move classes to have students utilize computers, are significant barriers to technology use in school (Cuban, 2006; Gray et al., 2010; Whiteworth & Berson, 2003). Alongside cost and access is teacher comfort in aligning technology to pedagogy.

As schools continue to struggle implementing digital technology into the curriculum, students’ personal lives are immersed in digital technology and online activities. Teen use of digital technology and teen access to online sources has increased significantly in the past decade (Kaiser Family Foundation, 2010; Madden, Lenhart, Duggan, Cortesi & Gasser, 2013). In 2009, 84% of 8 to 18 year olds had online access at home and 76% used or owned a handheld device that accessed the internet. Also, 11-14 year olds reported in 2009 that on average they were exposed to 11 hours of media (television, music, online/computers, or video games) in a typical day (Kaiser Family Foundation, 2010). In 2013, teen access to the internet had increased to 94%, and 74% of 12-17 year olds reported having at least some access to online sources with a mobile device (Madden et al., 2013). As students continue to interact with media in their personal lives, educators have debated how to best utilize technology in the classroom. The role of technology in the social studies classroom is not immune from the changing trend of the accessibility of digital technology and classroom use. In the changing face of technology use by students and teachers in the past decade an exploration of how researchers have defined technology in the social studies and how the use
of technology can enhance the social studies is warranted.

The social studies curriculum has always been riddled with controversy, as scholars disagree over what should be taught, how it should be taught, and why it should be taught (Wineburg, 1999). Much of the debate in social studies over what is important for students to know and do revolves around the transmission of information and rote memorization (Barton & Levstik, 2003). The National Council for the Social Studies (NCSS) called for a pedagogical shift in social studies instruction with its publication of the *C3 Framework for Social Studies State Standards* (NCSS, 2013). The C3 Framework is the NCSS’s guide for the creation of state standards in social studies education. The C3 encompasses the goals of the NCSS to create college, career, and civic readiness in students across America (NCSS, 2013). In the *C3 Framework* (2013), the NCSS proposed a social studies curriculum grounded in inquiry. The *C3 Framework* states:

> Now more than ever, students need the intellectual power to recognize societal problems; ask good questions and develop robust investigations into them; consider possible solutions and consequences; separate evidence-based claims from parochial opinions; and communicate and act upon what they learn. (NCSS, 2013, p. 6)

This statement by the NCSS provides an overarching goal to transform traditional instruction and learning in social studies education into inquiry driven instruction.

High school teachers are faced with the challenge of preparing students for learning and work in the 21st century. Social studies inquiry is described by the NCSS (2013) as a more authentic way to prepare students for the rigor of higher education and the workplace. Access to technology resources and the affordability of mobile devices has made it possible for many schools to have technology available to every student. This study will examine the experiences
of high school students in an inquiry driven, technology rich classroom, and how students construct meaning through technology and inquiry in social studies. The classrooms in this study have adopted mobile technology with a one-to-one ratio, employ teachers who are committed to the use of technology in learning, and have adopted curriculum changes to reflect the use of social studies inquiry in instruction and learning.

Conceptual Framework

This study examined two trends in social studies education and how those trends may change the way high school students learn and make meaning in the classroom. The C3 is a guide to implement inquiry into the social studies classroom. The C3 builds from the work of social studies educators who have supported inquiry learning for decades (Banks & McGee-Banks, 1999; Beyer, 1979; Massialas & Cox, 1966). One-to-one teaching and learning is a classroom environment that gives every student and teacher access to mobile technology. Thus, the framework for this research emerged from two trends in social studies education: inquiry and mobile technology use.

Social Studies Inquiry

According to the NCSS and the C3 Framework (2013) social studies inquiry revolves around four dimensions (see Table 1).
Table 1

The Four Dimensions of the *C3 Framework* (NCSS, 2013, p. 13)

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<tbody>
<tr>
<td>Developing questions and planning inquiries (for students, and by students)</td>
<td>Using the unique tools of the social studies disciplines: Civics, Economics, Geography, History</td>
<td>Gathering and evaluating evidence</td>
<td>Communicating and critiquing conclusions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developing claims and using evidence</td>
<td>Taking informed action</td>
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</table>

The four dimensions of the *C3 Framework* are a curriculum guide for implementing inquiry into any social studies classroom. Each dimension should be addressed as teachers design inquiries for high school students, or encourage inquiries by high school students. The *C3 Framework* informs curriculum choices and actions by teachers and school districts that want to increase the use of inquiry in their high school classrooms.

There are three seminal works in social studies inquiry that emerged from 1966 to 1999 and they are further explicated in chapter two. Each of the seminal works on social studies inquiry disagree on the number of steps involved in inquiry and the importance of each step in the process, but there are common elements. Table two summarizes the steps in the inquiry process by the three seminal works in social studies inquiry (see Table 2).
Table 2

The Three Primary Models of Inquiry

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*Doubt and concern from the learner</td>
<td>Defining a problem or question</td>
<td>Orientation to a problem</td>
</tr>
<tr>
<td>*Questioning by the learner</td>
<td>Hypothesis development</td>
<td>Hypothesis development</td>
</tr>
<tr>
<td>*Hypothesis development</td>
<td>Testing the hypothesis against relevant data</td>
<td>Exploration</td>
</tr>
<tr>
<td>*Definition of terms and conceptualization</td>
<td>Drawing a conclusion about the accuracy of the hypothesis</td>
<td>Evidencing</td>
</tr>
<tr>
<td>Collection of data</td>
<td>Applying the conclusion and generalizing</td>
<td>Generalization</td>
</tr>
<tr>
<td>Evaluation and analysis of data</td>
<td></td>
<td>*Definition: Should occur throughout process and is not a distinct step.</td>
</tr>
<tr>
<td>**Testing the hypothesis and the creation of generalizations and theories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>** The first four steps of the model are influenced by the value orientation of the learner.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>** The final step in the inquiry process should generate new doubt and concern in the learner, generating new questions and inquiry</td>
<td></td>
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</tbody>
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The process of inquiry varies in the three primary models highlighted in table 2, but the focus on exploration of evidence and the development of thoughtful conclusions is universal. Also, the inquiry process is reflective and encourages the development of reflective thinking (Banks & McGee-Banks, 1999; Massialas & Cox, 1966; Meyerson, 2001; Stripling, 2009; Wayne, 1985). Good thinkers are reflective thinkers as they return to their ideas and enhance or adjust them. Social studies inquiry asks students to reflect on problems, evidence, conclusions,
and return to problems when new information is presented (Banks & McGee-Banks, 1999; Massialas & Cox, 1966; Wayne, 1985). According to the NCSS (2013), inquiry provides students with strong tools in disciplinary thinking that allows them to better function in a complex social world. The Four Dimensions of the C3 Framework are a reflection of past research and theory. The instructors in this study used the C3 Framework to guide their curriculum and asked students to engage in social studies inquiry in their classroom.

The New Learning Ecology

In order for mobile technology to influence learning in the social studies, the technology should be available to all students in the classroom. The development, and relatively low cost of mobile devices in recent years has allowed for more schools to experiment with one-to-one technology. According to Lei, Conway, and Zhao (2008), the central problem surrounding technology in schools should not be putting computers and digital tools into the school, but providing every student access to technology at school, and at home.

As the obstacles to providing students with ubiquitous access to technology are overcome by schools, and one-to-one environments are created in the classroom, the central task of social studies educators and researchers will be to evaluate how effectively mobile technology can influence the social studies classroom, and the process of inquiry. The seamless introduction of mobile technology into the daily interaction between students, teachers, and the community has the potential to change the ecosystem of the classroom (Lei et al., 2008; Spires et al., 2009; Spires et al., 2012). Spires et al (2012) describes the ecosystem of the one-to-one classroom as a “new learning ecology” where technology,
instruction, and learning are transformed through committed use by educators and students.

The ecosystem outlined by Spires et al. is highlighted in figure 1.

![Diagram of 1:1 Mobile Technology](image)

**Figure 1:** The new learning ecology in 1:1 settings.

As the classroom changes and technology is integrated, its role in facilitating the process of inquiry needs to be examined. In the social studies classrooms examined in this study the process of inquiry was guided by the Four Dimensions of the C3 Framework. Table 3 highlights the framework for this study as the New Learning Ecology facilitates the use of inquiry in technology rich classrooms (see Table 3).
As mobile technology is integrated into the classroom the characteristics of the Spires et al. (2012) Learning Ecology will facilitate the dimensions of the C3 Framework and C3 Inquiry Arc. Mobile technology will allow for each of the characteristics in the New Learning Ecology to emerge in a one-to-one classroom, and different characteristics will facilitate student engagement with each of the dimensions of the Inquiry Arc.

Problem and Purpose

The C3 Framework is a guide for states, schools, and instructors to better integrate Social Studies instruction and the Common Core State Standards in Social Studies (CCSS, 2015).
According to the NCSS, “connections between the *C3 Framework* and the *ELA/Literacy Common Core Standards* are “comprehensive and consistent” (NCSS, p. 21). As many states and school districts across the country adopted the CCSS and tie student outcomes to mastery of the Common Core, innovative instruction to meet the CCSS standards is encouraged (NCSS, 2013). For more than 50 years many social studies educators and theorists have called for an inquiry based approach to instruction and learning, but social studies inquiry has never taken root in the classroom. The “signature pedagogy” of the social studies remains one in which instructors rely on rote memorization and teacher centered instruction (Beck & Eno, 2012). As schools struggle with meeting the CCSS and preparing students to master the skills for “College and Career Readiness,” skills that are supported and developed with social studies inquiry (NCSS, 2013), more studies are needed on how high school students perceive these changes.

Another trend in American classrooms that encourages more student-centered learning and inquiry is the presence of mobile technology. As teachers work to incorporate more technology into their instruction and encourage student use of mobile technology to enhance learning, the benefits of a technology rich classroom to social studies inquiry can be significant. Many researchers have suggested that mobile technology offers exciting potential to facilitate the pedagogical shift encouraged by the NCSS (Berson & Berson, 2007; Bull, Hammond, & Ferster, 2008; Friedman, 20114; Friedman & Heafner, 2007; Friedman & Heafner, 2008; Lee, 2002; Lee & Molebash, 2004; Saye & Brush, 2002; Tally & Goldenberg, 2005). Many schools have embarked on a journey into one-to-one mobile technology in the classroom, as mobile devices have undermined many of the barriers to traditional technology use in schools. As technology changes the ecosystem of the classroom, more research is needed to investigate the influence of
mobile technology and inquiry on high school student’s perceptions of the social studies classroom.

In the current era of educational reform, students are rarely faced with just one initiative in the classroom, but multiple initiatives, and studies of student experiences with these reforms are important. While many researchers have explored the connection between standards, technology, and inquiry with achievement, few have explored student experiences with these initiatives. The NCSS, Common Core, and many other organizations are attempting to transform the social studies classroom, and this transformation has direct influence on how students construct meaning out of their classroom experience. According to Lee and Spires (2009), listening to student voice when adopting technological change in the classroom is essential to teacher facilitation of their student’s education. The purpose of this study was to examine the voice and experiences of high school students, and how high school students construct meaning through inquiry and mobile technology in the social studies classroom.

Research Questions

In this study, the following research questions will be addressed:

1) How do high school students voice their experiences in a technology rich, inquiry driven, social studies classroom?
   a.) In what ways do students use mobile technology in social studies inquiry?
   b.) How do high school students construct meaning from social studies inquiry using mobile technology?
Methodology

This research consists of a descriptive case study of two history classrooms in a large suburban high school. The participants in one classroom were 11th grade US History students aged 16 to 17 years old. The participants in the other classroom were 9th and 10th grade World History students aged 14 to 16 years old. The students in this case study were diverse in regard to gender, ethnicity, and academic ability. Students were observed in both classrooms and instructed by veteran teachers, with 12 or more years teaching experience. 109 students were observed in both classrooms, 20 participated in focus groups, and nine consented to personal interviews concerning their experiences in the classroom. Also, 40 documents were collected from students that highlighted their use of inquiry and technology in the classroom. All data collected was transcribed and organized in an easily accessible repository. Data was analyzed with a three-step process in order to extract general themes from the data. Themes were analyzed through the lens of current research on social studies inquiry, technology in the social studies context, and student voice.

Delimitations

The following are delimitations that define the scope of this study. First, as this study was conducted in a school that followed a unique plan to implement inquiry and one-to-one technology into the social studies classrooms, the experiences of the students may be relevant, but not exactly the same as in other settings. Second, this study was conducted on one 9th and 10th grade history classroom and one 11th grade history classroom. Due to convenience and proximity to researcher, other social studies classrooms and 12th grade students were not
included. Third, this study makes extensive use of convenience and purposeful sampling to collect data. Purposeful sampling was used to ensure that the right conditions of inquiry and technology were met in each classroom studied. Finally, as this research was focused on the experience of students; teachers, administrators, and other stakeholders in the school were not included in this case study.

Significance of Study

The results of this study contribute to current research on mobile technology in social studies education. The findings reflect high school students’ experiences in technology rich inquiry driven social studies classrooms. There is little current research on student voice in in a technology rich setting, as much of the focus on technology in education examines its influence on student motivation and teacher instruction (Warschauer, 2011). This study also provides insight into how mobile technology can facilitate student inquiry in the social studies. As students engage in inquiry and utilize the process of inquiry proposed by theorists and the NCSS, their perceptions can inform current calls to increase inquiry learning into the high school social studies classroom. An analysis of student voice in a one-to-one environment, engaged in the use of inquiry, is also significant because students are the most affected by change in the classroom. Students are rarely faced with one educational initiative and studies that examine student voices when confronted with multiple initiatives, that may challenge their traditional perceptions of school and the classroom are important. Taking student voice into account throughout the process of educational change can improve the both the experience of students and the profession of teaching.
Definitions

In order to clarify terms within the context of this study the following concepts are defined:

**Social Studies Inquiry** - Inquiry in the social studies context is a process in which students investigate social and historical phenomena using all Four Dimensions of the C3 Framework. Social studies inquiry asks students to reflect on problems, evidence, conclusions, and return to problems when new information is presented (Banks & McGee-Banks, 1999; Massialas & Cox, 1966; Wayne, 1985).

**Mobile Technology** - For the purposes of this study, mobile technology is defined as the ubiquitous use of tablets, cell phones, or laptops by high school students. Every student in this study will have access to handheld tablets (iPad), cell phones, and the resources of the internet.

**One-to-one Learning Environment** - Functionally, one-to-one is the ratio of computers to students in the classroom. In this study, high school students will have access to mobile technology and the internet while at school, and presumably at home. Student use of mobile technology in a one-to-one environment is holistic and includes the instructional process of teachers as well as facilitating learning by students (Weston & Bain, 2010).

**The New Learning Ecology** - Students in a one-to-one setting are encouraged to use mobile technology seamlessly to engage in inquiry. The seamless and holistic introduction of mobile technology into the classroom will encourage a new learning ecology outlined by Spires et al. (2012). The New Learning Ecology highlighted in figure 1 suggests that access to technology creates a new way of perceiving knowledge and learning. This new ecosystem is fed by four unique conditions for teaching and learning outlined in figure 1.
Organization of Study

This study is presented in five chapters. Chapter one introduces the study, highlights the problem and purpose of the study, outlines the research questions, and frames the study in a conceptual framework. Chapter two contains a review of the literature on social studies inquiry, technology in social studies education, and one-to-one technology use. Chapter three discusses the methodology, in particular the participants, data collection, and data analysis techniques. Chapter four will review and discuss the data collected. Finally, implications of the research and recommendations for future research will be addressed in chapter five.
CHAPTER 2
A REVIEW OF THE LITERATURE

The purpose of this study is to listen to how high school students construct meaning through inquiry and mobile technology in the social studies classroom. The following literature review synthesizes the research on social studies inquiry, technology use in social studies classrooms, mobile technology, and student voice.

Social Studies Inquiry

The emphasis on inquiry learning that is at the heart of the NCSS, and the *C3 Framework* has deep roots in social studies education. Much of the early emphasis on inquiry can be connected to progressives who encouraged students to use higher order thinking and analysis to address real world concerns and interests (Memory, Yoder, Bolinger & Warren, 2004). Despite the calls by progressives to change school curriculum, little change was realized in classrooms across the country. The most significant effort to reform social studies instruction in the US occurred during the 1960s and 1970s.

The New Social Studies Movement

The New Social Studies Movement emerged from two sources, the publication of Bruner’s (1960) *The Process of Education*, and the post Sputnik fear which spawned increased
federal funding (Reisman, 2012). The New Social Studies Movement was driven by curriculum
reformers who emphasized discovery learning, inquiry, and students as the creators of
knowledge (Damico & Baildon, 2011; Memory et al, 2004). Social studies inquiry in the era of
the New Social Studies attempted to move away from the rigid, compartmentalized disciplines in
schools and create an interdisciplinary approach to engage in inquiry (Beyer, 1994; Krug, 1967;
Engle, 1965).

One of the earliest pioneers in inquiry based social studies education was Shirley Engle.
Engle (1965) divided social studies education into two continuums, the “content continuum” and
the “process continuum” and explained the aims of the two continuums are often contradictory
(p. 12). Engle defines process based social studies as a curriculum that encourages students to
explore, learn, and create within the confines of a unified, interdisciplinary, social studies. In a
content based social studies curriculum however, the student is instructed in the important
concepts of the separate social science disciplines (Engle, 1965). The goal of social studies
inquiry for Engle was to ask students to use all the tools of the social studies to create
personalized meaning.

Others attempted to separate pure social studies inquiry which placed the student at the
center of learning, from disciplinary teacher centered inquiry. Feely (1972) differentiated
between “student-centered inquiry” and “scholarly-based inquiry.” (p. 5) Student-based inquiry
is student driven because students generate the questions or identify the problems that are
meaningful to them at the beginning of the inquiry process. Scholarly-based inquiry is guided by
the tools and criteria of the discipline, according to Feely, the first stage of the process in
scholarly-based inquiry is decided by the teacher. The goals in scholarly-based inquiry is for the
learner to adopt a particular disciplines’ frame of reference, this according to Feely, makes scholarly-based inquiry a more realistic instructional tool in the classroom.

During the New Social Studies Movement, the development of inquiry driven classroom materials and programs to assist teachers coincided with attempts to reframe the social studies as inquiry based and interdisciplinary (Byford & Russell, 2007; Fitchett & Russell, 2012). Universities, non-profit groups, and social studies organizations all set out to recreate the social studies and provide teachers with practical inquiry-driven materials (Byford & Russell, 2007). The most controversial program was *Man: A Course of Study (MACOS)* (Fitchett & Russell, 2012). *MACOS*, focused heavily on anthropological research and inquiry assignments on the meaning of humanity, and was attacked by the right for its perceived lack of values and the left for its insensitivity to primitive people. It lost its funding in 1975 (Byford & Russell, 2007; Fitchett & Russell, 2012; Reisman, 2012).

In his analysis of the Carnegie-Mellon Social Studies Curriculum Project, Lieberman (1975) wanted to explore student growth in social studies concepts, inquiry skills, attitudes toward social studies, and moral judgement. Lieberman conducted an extensive analysis of four high schools. Lieberman administered pre and posttests to participants, a 40-item survey, and conducted interviews with students. Lieberman found that there were only slight gains in achievement and inquiry skills, but significant gains in moral maturity and moral judgement. While researchers like Lieberman were able to find some benefits to the curriculum projects of the New Social Studies, critics eventually ensured the end of the New Social Studies Movement, and by the 1980s only remnants of the attempt to “revitalize” the social studies remained (Byford & Russell, 2007). Despite the decline of programs and projects in the era, theorists were able to
establish models of inquiry that still inform social studies inquiry today.

**Three Primary Models of Social Studies Inquiry**

Social studies education theorists during the new Social Studies Movement developed models of inquiry students could utilize in the classroom (Beyer, 1979; Cox & Cousins, 1965; Massialas & Cox, 1966). Two of the early social studies inquiry models were developed by Massialas and Cox (1966) and Beyer (1979). The model developed by Massialas and Cox (1966) is composed of six stages: orientation where the students and teacher become aware of a problem, hypothesis development, exploration, evidencing, and generalization. The sixth step in the Massialas and Cox’s model, definition, is not distinct because it occurs throughout the process of inquiry. The most significant contribution of the Massialas and Cox’s Model is its emphasis on reflective thinking, which the authors contend should occur throughout a student’s inquiry. Reflective inquiry asks that the student return to each step, clarify definitions, and generate new questions for inquiry, reflection was at the root of good inquiry (Cox & Cousins, 1965; Massialas & Cox, 1966). According to Massilias and Cox, reflective inquiry encourages the exploration of values and value judgements, which is its greatest strength.

Beyer’s (1979) text defines social studies inquiry within the confines of three basic characteristics; the feelings, attitudes and values of the learner, the knowledge of the learner, and the process of inquiry. Each of the characteristics of inquiry, according to Beyer, interact throughout the inquiry process and shape the individual students’ construction of meaning. The key to good inquiry for Beyer was the inquiry process, which like Massialas and Cox (1966), contained six steps: defining a problem or question, the development of a hypothesis, testing the
hypothesis against relevant data, drawing a conclusion about the accuracy of the hypothesis, and finally applying a conclusion and generalizing. In Beyer’s inquiry model, the emphasis on reflection is reduced, and student inquiry ends when they are able to draw meaningful conclusions and generalizations. In his paper presented to the Annual Meeting of the National Council for the Social Studies, Wayne (1985) attacked Beyer’s inquiry model for “denying real world thinking” (p. 7). Wayne argued that following a “logical-analytical model” for inquiry reduces thinking to a series of steps that can be evaluated. Wayne, suggests that reflective inquiry should revolve around real world problems and issues, and be a process generated by the student, not an artificial thinking process that would never be applied outside of the classroom.

Despite the criticisms, the inquiry models of Massialas and Cox (1966) and Beyer (1975) continue to be viable options for conducting inquiry in the classroom. Both models also informed the development of Banks and McGee Banks’ (1999) Social Inquiry Model. Banks and McGee Banks’ model of social inquiry is grounded in eight steps: doubt and concern from the learner, questioning by the learner generates a testable hypothesis, the formulation of a hypothesis, the definition and conceptualization, collection of the data, evaluation and analysis of the data, testing the hypothesis and the creation of generalizations and theories, and the beginning of inquiry anew. In Banks and McGee-Banks’ model, the first four steps are informed by the value orientation of the learner, which has a direct influence on a student’s inquiry process. The final step, according to Banks and McGee-Banks, highlights the cyclical nature of social studies knowledge, as the forming of conclusions and generalizations should lead to new doubt and concern from the learner, generating new questions for inquiry. Banks and McGee Banks’ model also stresses the applicability of the model to all facets of the social sciences.
While the primary models of inquiry may disagree on the number of steps involved in inquiry and the importance of each step in the process, there are common elements that emerge. A side by side comparison of the three inquiry models, in chapter one, highlights the similarities and differences in each model of social studies inquiry. The process of inquiry varies in the three primary models, but the focus on exploration of evidence and the development of thoughtful conclusions is universal. Also, the inquiry process is reflective and encourages the development of reflective thinking (Banks & McGee-Banks, 1999; Massialas & Cox, 1966; Meyerson, 2001; Stripling, 2009; Wayne, 1985). Good thinkers are reflective thinkers as they return to their ideas and enhance or adjust them. Social studies inquiry asks students to reflect on problems, evidence, conclusions, and return to problems when new information is presented (Banks & McGee-Banks, 1999; Massialas & Cox, 1966; Wayne, 1985). According to the NCSS (2013), inquiry provides students with strong tools in disciplinary thinking that allows them to better function in a complex social world.

**Application of Social Studies Inquiry in the Classroom**

Many theorists and researchers have continued to adapt inquiry models to inform student inquiry in the social studies classroom (Meyerson & Secules, 2001; Milson, 2002; Milson & Downey, 2001, Peters, 1994; Rothe, 1993; Stripling, 2009). All of the models are informed by the three primary models outlined in table 1. In his study on uses of Web Quests for student inquiry, Milson (2002) adopted the model for inquiry developed by Dodge (1995). Dodge developed an inquiry process that students could engage in collectively to complete inquiry tasks online. Dodge’s Web Quest model has five steps: introduction, task, process, evaluation, and
conclusion. The Web Quest model borrowed from the three inquiry models in table 1 (Milson & Downey, 2001; Milson 2002). For instance, Milson characterized the introduction step in Web Quests as the problem orientation or definition step in the Beyer (1979) and Massialas & Cox’s model. Milson employed a case study methodology in a sixth-grade classroom and found that students did not necessarily prefer Web Quest activities to carry out inquiry over traditional paper and pencil. Milson did find that Web Quests do allow students of varying academic abilities to carry out inquiry based investigations. The process of inquiry outlined by Dodge & Milson seems to be an oversimplification of the inquiry process and the reliance on direct links and teacher direction. Beyer (1979) warned against conducting inquiry as a simple reduction to questions and answer searches, which Web Quests often become.

Reconceptualizing inquiry models seems to be most prevalent in problem-based issues-centered learning in the social studies. Inquiry skills are student-centered and revolve around questions generated by students and address real world concerns (Berson & Berson, 2007; Brush & Saye, 2008; Engle & Ochoa, 1988; Levitt & Longstreet, 1993; Memory, Yoder, Bolinger & Warren, 2004; Saye & Brush, 2002). Questions of inquiry in the social studies often focus on societal problems or controversial issues in order to generate student interest. Memory, Yoder, Bollinger and Warren (2004) encourage questions that address problems and issues students can relate to on a personal level. According to Brush and Saye (2008), as students develop an ability to determine questions and arrive at realistic solutions they learn to evaluate data and use information to come to decisions about societal concerns. The most common way that social studies educators can use questions to generate interest and inquiry in students is to ground them in social, economic, and historical problems.
One of the seminal books in issues based education is Engle and Ochoa’s (1988) *Education for Democratic Citizenship: Decision Making in the Social Studies*. Engle (1965) defined the teaching of social studies as a powerful and necessary tool in the development of an informed, critically conscious, and socially responsible citizenry. To Engle and Ochoa (1988) a socially responsible citizenry could be partially achieved through meaningful issues-based inquiry in the social studies. Engle and Ochoa outlined a framework for discussing and resolving social studies issues in four phases: provide a safe informed learning environment for the free exchange of ideas, Orientation to the problem, Identifying and defining the problem through discussion, whole class discussion (discussion in this phase involves probing questions from the teacher, identifying value assumptions, prediction of consequences, and reaching a decision). Engle and Ochoa’s framework engages students in meaningful discussion of issues in the social studies and other researchers have begun to explore the benefits of issues-based social studies in engaging students in inquiry (Brush & Saye, 2008; Caron, 2005; Hess & Posselt, 2002).

Focusing questions within the framework of problems and social issues can help generate powerful questions for inquiry and focus student analysis and discussion in the social studies (Brush & Saye, 2008; Caron, 2005, Memory, Yoder, Bollinger & Warren, 2004; Hess & Posselt, 2002. Sardone & Devlin-Scherer, 2015; Saye & Brush, 1999). Hess and Posselt (2002) studied students in a public policy course at a Midwest high school and found through extensive qualitative research that students respond to discussion of public issues when they are connected to real world concerns. As questions help focus student inquiry in all social studies disciplines they can also be the driving force in historical inquiry. As Caron (2005) explains, postulating central questions when designing a history classroom offers students the opportunity to explore
issues that are important for the development of strong democratic citizens.

Many researchers have also generated new models of inquiry, or adapted Engle and Ochoa’s (1988) discussion framework when conducting issues-based learning in social studies classrooms (Meyerson & Secules, 2001; Peters, 1994; Rothe, 1993; VanHover & Van Horne, 2005). Peters’ (1994) Proactive Action Model (PAM) reduces inquiry to four steps: identify a problem or issue, research and review to generate a hypothesis, conduct more study to test the hypothesis and arrive at a conclusion, and design a resolution strategy and report the findings. Peters referred to his model as a “modified scientific method schema” that could be applied to investigate any social or historical problem (p. 8). Meyerson and Secules (2001) proposed an “Inquiry Cycles Model” to teach students how to deal with complex world and national issues. Meyerson and Secules define an inquiry cycle as a process by which students can work to generate their own understanding of a controversial issue or topic. The inquiry cycle is composed of five steps: the anchor which defines the problem or issue, the generation of universal questions about the issue (this is a collaborative process), research from the various fields of the social studies, debate from the viewpoint of the various fields of the social studies, and finally a collaborative solution to the problem (Meyerson & Secules, 2001). The key difference in models related to issues-based social studies when compared to the inquiry models in table two is the emphasis on generating a collaborative solution to problems (Meyerson & Secules, 2001; Peters, 1994; Rothe, 1993; VanHover & Van Horne, 2005). Issues-based social studies continues to be a powerful way to carry out inquiry in the social studies classroom.
In the past two decades, one of the most active social studies disciplines in the discussion of inquiry is history. While historical inquiry differs from the inquiry outlined in table 1, it borrows and adapts much of the work on social studies inquiry. The historical inquiry process has three main characteristics that researchers tend to highlight in their studies: the development of questions and historical understanding, the development of disciplinary literacy skills, and constructing a narrative or historical thesis (De La Paz, 2005; Monte-Sano, 2011; VanSledright, 1997; Wineburg, 1999).

The development of good questions for historical inquiry, as in all inquiry, is the first step in the process. Questions guiding historical inquiry can be generated when students examine historical evidence closely (VanSledright, 1997). VanSledright (1997) studied two fourth grade classrooms in an attempt to uncover if students reading multiple sources of information on a historical topic can develop strong historical inquiry skills. Through his detailed analysis of classroom observations and teacher and student interviews, VanSledright found that students when confronted with conflicting opinions and evidence in historical sources and guided by a skilled teacher, were able to generate questions for inquiry, as well as judge an author’s point of view. Meaningful questions are an important part of social studies and historical inquiry. As orientation to the problem or question is essential in the first steps of the inquiry models in table 1, the development of historical understanding is essential in historical inquiry.

Sam Wineburg is one of the most outspoken supporters of historical inquiry and the development of historical understanding. According to Wineburg (1999), historical understanding is the process in which “we come to know others” (p. 498). In other words,
history is a subject that has the potential to allow us to expand our understanding of others far removed from our present lives (Wineburg, 1999). In his analysis of the ways in which individuals reasoned through historical text, Wineburg (1999) explains that historical understanding is a very difficult cognitive task that does not come naturally. VanSledright and Kelly (1996) also characterize historical understanding as perspective taking with people of the past, situating learning in a historical context, and using skills to analyze historical text and evidence to re-construct the past. Historical understanding is the mental process of orienting the student to past events, people, and places. According to researchers in historical inquiry, this orientation with the past is important to conducting meaningful historical inquiry. At the core of historical understanding is the development of complex disciplinary literacy skills in history (VanSledright & Kelly, 1996; Wineburg, 1999).

Historical literacy is generated from a history curriculum that encourages exploration of documents, interpretation of sources, and the formalizing of opinions, not as fact, but as constructs of the student’s knowledge (Martin & Wineburg, 2008; VanSledright & Kelly, 1996; VanSledright, 1997; Wineburg, 1999; Wineburg & Martin, 2004). Much of the literature in historical inquiry supports the deep level of critical reasoning and thinking needed to analyze primary and secondary sources in a social studies classroom (Damico & Baildon, 2011; De La Paz, 2005; Monte-Sano, 2011; Mont-Sano & De La Paz, 2012; Reisman, 2012; VanSledright & Kelly, 1996; Wineburg, 2015; Wineburg & Martin, 2004). The purpose of history, according to Martin and Wineburg (2004) is to create students who are capable of being “informed readers, writers, and thinkers about the past as well as the present” (p. 45). Beck and Eno (2012) also characterize historical literacy as a process in which students develop an ability to ask probing
questions, explore research, and generate personal meaning. While developing the ability to engage in documentary analysis is essential to historical literacy, many researchers have also discussed how to develop historical understanding in students.

Jeffrey Nokes (2010) defines history-specific literacy practice as the analysis of primary sources and documents with the intent to generate questions and support conclusions. Historical inquiry encourages critical reading of sources as a key component in developing historical understanding. VanSledright and Kelly (1996) studied a fifth-grade classroom learning American history over a period of six months. The study collected data from classroom observations and student interviews in which students were asked to employ a think aloud and answer questions related to their understanding of historical sources. VanSledright and Kelly chose six students out of a possible 23 to interview, and no indication was given that the selection process was random. According to VanSledright and Kelly, evidence of historical literacy and historical understanding was found in the qualitative data collected, but in order to achieve historical literacy, teachers need to give access to multiple sources and instruct students in the development of complex reading strategies.

Social studies researchers have expanded on historical literacy and theorized that an essential part of the inquiry process is a student’s development of “historical empathy,” or the need to connect on an emotional level with a source (Beck & Eno, 2012; Tally & Goldenberg, 2005; Grim, Pace, & Shopknow, 2004; Reisman, 2015). Historical empathy is the direct result of a student’s ability to examine a source within context and a critical eye to develop personal meaning (Beck & Eno; 2012). Tally & Goldenberg (2005), in their well-designed study of middle and high school students’ analysis of primary sources, found that while students were
able to display historical thinking, it was often dependent on being both cognitively and emotionally engaged. Emotional engagement requires deep critical thinking about historical documents which includes evaluating authenticity and value, recognizing points-of-view and bias, and understanding context (Tally & Goldenberg, 2005; VanSledright & Kelly, 1996; Wineburg, 2015; Wineburg & Martin, 2004). Emotional engagement with a historical source is central to employing historical empathy in analysis.

In an effort to analyze how well secondary students employ historical empathy and engage in historical reasoning, Reisman (2015) videotaped 11th grade American history students engaging with historical documents and using textual evidence to support historical reasoning in whole-class discussions. In Reisman’s extensive analysis of 7,000 minutes of 11th grade classroom discussions she found that only 132 minutes effectively engaged students in meaningful historical inquiry. According to Reisman, the inability of students to engage in meaningful inquiry correlated to their lack of historical empathy as they develop meaningful inquiry and reasoning skills. While historical literacy through the analysis of sources and discussion is at the core of developing historical understanding, the end result of historical inquiry is the development of a narrative or thesis.

For many researchers, writing is an important vehicle in which the social studies discipline presents its findings and discusses its interpretations of sources and evidence. Most importantly, writing is where evidence is used to present an argument, and the results of deep inquiry are shared. Supporters of writing as an integral part of the historical inquiry process point toward research that suggests reading and writing can no longer be relegated to the language arts classroom if students are going to be prepared to tackle complex texts they
encounter in college and in life (Reisman, 2012; VanSledright, 1996). Susan De La Paz (2005) combined historical reasoning instruction and argumentative essay writing strategies to study high school students’ ability to create higher quality historically based argumentative essays over a control group who did not receive the same treatment. De La Paz (2005) found that students who employed historical reasoning in their analysis of sources and were given opportunity to perfect their argumentative writing skills in both a history class and language arts class produced higher quality essays. The essays of the experimental groups were longer, possessed enhanced persuasive quality, and were historically more accurate (De La Paz, 2005).

Historical writing is also enhanced when students are given writing tasks that focus their reasoning process on sourcing corroboration, and causal analysis (Monte-Sano, 2011; Monte-Sano & De La Paz, 2012). Chauncy Monte-Sano (2011) employed a case study of 17 students in an American history classroom in order to uncover teaching and learning that elicited analysis, corroboration of conclusions with evidence, and reasoning in student writing. The study was limited to one classroom in a relatively high performing high school and was also structured to support inquiry and advanced literacy skills, providing large blocks of time for the development of these skills. Monte-Sano does acknowledge the limited nature of his study, but does not dismiss the importance of the findings. Students engaged in complex analysis of sources and guided by a savvy instructor showed a positive progression of historical reasoning and evidence based writing (Monte-Sano, 2011). Despite historical inquiry’s emphasis on close analysis of textual evidence and literacy skills, a side by side look at how the two forms of inquiry compare can highlight similarities in each.

The characteristics of social studies inquiry and historical inquiry share many similarities,
but historical inquiries, which are situated in the past, require the learner to use unique disciplinary tools when evaluating sources (Damico & Baildon, 2011; De La Paz, 2005; Montesano, 2011; Mont-Sano & De La Paz, 2012; Reisman, 2012; VanSledright & Kelly, 1996; Wineburg, 2015; Wineburg & Martin, 2004). Table 4 below highlights the characteristics of each form of inquiry and their differences.

Table 4
The Characteristics of Social Studies Inquiry and Historical Inquiry

<table>
<thead>
<tr>
<th>Social Studies Inquiry</th>
<th>Historical Inquiry</th>
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<tbody>
<tr>
<td>• Developing questions and planning Inquiries</td>
<td>• Developing questions for inquiry</td>
</tr>
<tr>
<td>• Collecting evidence and sourcing</td>
<td>• Collecting evidence and sources</td>
</tr>
<tr>
<td>• Evaluation of the evidence to develop generalizations</td>
<td>*Developing historical understanding</td>
</tr>
<tr>
<td>• Communicating generalizations and outcomes of inquiry</td>
<td>• Evaluation of sources and evidence</td>
</tr>
<tr>
<td></td>
<td>*Using historical literacy</td>
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<tr>
<td></td>
<td>*Developing historical empathy</td>
</tr>
<tr>
<td>Social studies inquiry is utilized across the social studies disciplines and attempts to generate hypothesis and conclusions from gathered and evaluated evidence. Social studies inquiry is predominant in issues-based and problem-based social studies approaches.</td>
<td>Communicating outcomes of inquiry</td>
</tr>
<tr>
<td>Historical inquiry is confined to the history classroom and requires students to develop historical understanding by situating the learner in a specific historical context. Historical inquiry also demands that the learner develop historical empathy with the opinions, observations, and experiences of people of the past.</td>
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</tbody>
</table>

As Table 4 displays, the key difference in historical inquiry from social studies inquiry is the need for the learner to situate themselves in the historical context. Many researchers have accepted Wineburg’s (1999) characterization of historical inquiry as “thinking like a historian” in which learners develop a deeper level of understanding and empathy with historical sources in order to construct a meaningful narrative of the past. As technology is implemented in many social studies classrooms researchers have explored the varied ways that students can generate
outcomes and narratives with technology.

Inquiry based social studies classrooms can employ multiple formats to share narratives and communicate conclusions. Beck and Eno (2012) in their extensive review of the uses of technology in the social studies, state that debate is a “good way for students to delve into questions that form the basis of inquiry, take a stand on a particular topic, and provide concrete evidence to support assertions” (p. 81). Technology has opened the door for alternative ways for students to exercise historical literacy skills. Discussion and debate using web based discussion posts, social media, and blogging tools encourage students to employ the skills of historical literacy (Beck & Eno, 2012; Bull, Hammond, & Ferster, 2008; Manfra & Lee, 2012).

Manderino (2014) used multimodal online text to measure eleventh grade American history students’ ability to engage in historical inquiry. While students in the Manderino (2014) study did not always exhibit complex historical literacy skills they were able to engage “in complex reading behaviors like making inferences, evaluations, and elaborations”. Also, there was evidence through analysis of student work and interviews that students can engage in complex reading across multiple texts, and desire access to multiple texts (Manderino, 2014). Technology may enhance student experiences when conducting historical inquiry and it also provides students with various ways to construct historical narratives.

Technology offers tools to publish narratives on historical topics in the form of Wikis; Wikis allow students to construct knowledge and return and adjust their understanding over periods of time. Memory, Yoder, Bolinger and Warren (2004) highlight examples from their research that include geography classrooms employing travel itineraries, economic classes presenting reports and analysis of the most effective use of resources, and government students
writing briefs about important public issues. Alongside Wikis and blogs, social networking sites can be used for students to share and present their inquiry. Manderino & Ripley (2014) used a social networking site to build a 1960s profile of a fictional historical person as an outcome from their inquiry. Students conducted research, gathered evidence and constructed the profile over the course of eight weeks. Online tools such as Wikis, blogs, and social networking can also be employed in history classrooms to present findings and share analysis of sources during and after student inquiry.

Technology in the Social Studies

In 1997, Peter Martorella claimed that technology was a “sleeping giant” in the field of social studies education. This statement by Martorella sums up much of the early research on technology in the social studies, as he was reiterating the findings of many researchers in the 1990s (Benenson, Braun, & Klass, 1992, 1993; Ehman, Glenn, Johnson, & White, 1992; Fontana, Dede, White, & Cates, 1993). A common early research focus on the use of technology in social studies classrooms was the potential of technology to promote “higher order thinking skills” (Ehman et al., 1992, p. 181). These higher order skills were generated from the increased use of primary and secondary source information, and technology made these sources more accessible to students and teachers.

Technology and access to resources in the social studies

As access to resources became a reality, researchers in social studies, especially history, discussed the promise of asking students to engage in meaningful historical inquiry with online
resources of primary and secondary evidence (Beck and Eno, 2012). The first step to asking students to engage in authentic historical inquiry is to instruct them in disciplinary or historical literacy (Martin & Wineburg, 2008; Wineburg, 1999) Historical literacy is generated from a history curriculum that encourages exploration of documents, interpretation of sources, and the formalizing of opinions, not as fact, but as constructs of the student’s knowledge (Martin & Wineburg, 2008; VanSledright & Kelly, 1996; VanSledright, 1997; Wineburg, 1999; Wineburg & Martin, 2004).

For many researchers, the internet encourages historical literacy as it opens millions of historical documents in online repositories (Bolick, 2006; Bull, Hammond & Ferster, 2008; Lee, 2002; Lee & Molebash, 2004; Martin, & Wineburg, 2008; Tally & Goldberg, 2005). Bolick (2006) refers to the increased access to primary source materials as the “democratizing of the doing of history” (p. 122). Bolick suggests that what was once access limited to professional historians and university students is now available to any student and teacher with access to the internet. While the availability of online resources encouraged the development of historical literacy and inquiry by giving students the opportunity to explore multiple sources, it does not advance the definition of technology beyond student use of online resources to complete teacher generated activities.

In the wake of the growth of personal use of technology by students and access to digital and online information, social studies researchers have expanded their definition of technology in regard to disciplinary or historical literacy. Researchers have encouraged that disciplinary literacy become multimedia supported, in which students interact with various types of text to construct understanding of social studies topics (Brush & Saye, 2008; Greenhow, Robelia, &
Hughes, 2009; Martin & Wineburg, 2008; Saye & Brush, 1999, 2002, 2007). In an effort to embrace the multimedia potential of the internet, Martin and Wineburg (2008) revisited Wineburg’s (1991) seminal study on historians performing a think aloud when reading a primary source. Martin and Wineburg video recorded historian’s during a think aloud and posted clips online highlighting the historians’ critical reading of a source. The purpose for Martin and Wineburg’s study was that students could view the process a historian engages in when reading a primary source first-hand, helping students to visualize historical literacy. Although Martin and Wineburg did not study the affect the think aloud may have on student development of historical literacy skills, they highlighted potential benefits of students being able to witness the process of historical analysis. By encouraging the use of visual text to aid student exploration of primary sources, technology use in the social studies moved beyond accessing textual resources in online repositories to including multimedia resources.

In their study, Brush and Saye (2008) combined a multimedia tool called Decision Point, a resource providing video, images, primary sources, and an interactive timeline on various historical events, with two history teachers experienced with problem based learning and inquiry. Following student use of Decision Point, Brush and Saye analyzed classroom observations, student work, and student and teacher interviews. The researchers were looking for emerging themes of student engagement, historical empathy, and assumptions about knowledge and history, ensuring validity through triangulation and member checking. Brush and Saye found that students were able to develop advanced beliefs about history, and displayed evidence of historical empathy. Although Brush and Saye’s study is limited to an analysis of a particular multimedia tool, it still provides valuable insight into the ability of multimedia technology to
encourage historical inquiry and empathy. In order to carry out their study, Brush and Saye expanded the definition of technology to multimedia resources that can be accessed and manipulated by students.

Other researchers have also expanded their definition of technology to include multimedia resources in an online environment through student use of virtual field trips, documentary clips, virtual museums, and multimedia tools when engaging in inquiry (Beck & Eno, 2012; Crawford, Hicks, & Doherty, 2009; Ilhan & Oruc, 2016; Sherman & Hicks, 2000; Wilson & Wright, 2010). Virtual field trips to museums and locations of cultural or historical importance offer authentic experiences for students, giving them a chance to see and interact with history and places in a way that might otherwise be impossible (Sherman & Hicks, 2000). Outside of virtual museums and field trips, games, simulations and virtual worlds allow students to participate in computer-modeled versions of the past (Barton & Levstik, 2003; Berson & Berson, 2007; Devlin-Scherer & Sardone, 2010; Sherman & Hicks, 2000).

In geography, researchers have leveraged the use of Geographic Information Systems (GIS) to engage students in deeper explorations of geographical space (Bednarz & Van Der Shee, 2006; Goldstein & Alibrandi, 2013). In using GIS technology, students are able to manipulate the data and information in front of them to generate deeper understanding of geographic concepts (Goldstein & Alibrandi, 2013). Hammond (2014) states that geospatial understanding through the use of GIS can contribute to many other disciplines in the social studies. While Hammond’s discussion of Geospatial Tools analyzed their use in the traditional history curriculum, he suggests that geographic technologies offer potential to enhance all facets of the social studies curriculum.
Technology and the Construction of Knowledge

Many researchers have also highlighted the benefits of technology in the construction and presentation of knowledge as well (Beck & Eno, 2012; Berson & Berson, 2007; Boon, Fore, & Spencer, 2007; Harris & Hofer, 2011; Mayers, 2008; Holcomb & Beal, 2010; Spires, H.A., 2015; Waters, Kenna, & Bruce, 2016; Ray, Faure, & Kelle, 2013; Zheng, Niiya, & Warschauer, 2015). Once students analyze, synthesize, and internalize information, they should be ready to organize information into meaningful constructs that can aid in understanding (Beck & Eno, 2012; Boon et al., 2007). There are many ways to organize and recreate stories of the past. One method used to help students visualize major concepts and see the relationships among information is concept mapping (Berson & Berson, 2007; Harris & Hofer, 2011; Mayers, 2008). Various software and applications make it easy for students to make concept maps or word clouds (Boon et al., 2001). For example, Mayers (2008) described student-created “story maps” after reading first-hand accounts of the Klondike Gold Rush. Story maps in Mayers' study outlined the narrative of firsthand accounts, as students identified main characters, historical context, and the progression of the account in their maps. Timeline creation software was also used to create a timeline of one historical person involved in the event, helping to clarify for students the chronology of historical events (Mayers, 2008). Storyboarding is another method mediated by technology that aids students in organizing historical narratives and connecting social studies concepts. Storyboarding breaks historical narratives and events into a designated amount of visuals, student generated or captured, to recreate the text. Crawford et al. (2009) used storyboarding software to scaffold students in the examination of subject matter, medium, symbolism, composition, and context of historical artwork. Their storyboarding software included built-in
online tools to assist in student understanding of key concepts.

Discussion and debate are useful exercises in the development of disciplinary literacy skills and engaging students in social studies inquiry. Discussion and debate using web based discussion posts, social media, and blogging tools encourages students to employ the skills of disciplinary literacy and inquiry (Beck & Eno, 2012; Bull, Hammond, & Ferster, 2008; Heafner & Friedman, 2008; Manfra, & Lee, 2012; Zheng, Niiya, Warschauer, 2015). By using these skills to create written productions, students have used technology to create knowledge. Researchers that have explored the creation of knowledge with various mediums broadened their definition of technology to include tools that produce and disseminate knowledge.

Technology offers tools that allows students to publish narratives or opinions for an audience and engage in discussions. Students can publish information through blogs and wikis (Frye, Trathen, Koppenhaver, 2010; Harris & Hofer, 2011, Heafner & Friedman, 2008; Holcomb & Beal, 2010, Mayers, 2008, Zheng, Niiya, & Warschauer, 2015). Manfra and Lee (2012) studied student outcomes from classroom use of an educational blog in an American History classroom. Through qualitative analysis of student discussion of historical evidence through blog posts, Manfra and Lee found that students were able to engage in historical analysis while working on the blog site. The blog site in Manfra and Hammond’s study allowed for student analysis and inquiry of diverse forms of historical content, as well as informed discussion with the teacher, and with peers. In their case study of two social studies teachers from pre-service education through their first five years of teaching, Wilson and Wright (2010) found that one teacher used online discussions and blogs to facilitate student discussion. Wilson and Wright observed students engaging in historical inquiry and discussing historical questions with peers,
as the participant in their study integrated online discussions and blogs into his classroom.

**Mobile Technology and the Social Studies**

The literature suggests that technology use in the social studies has been defined predominately as the use of computers, usually in labs, and as tools to enhance learning and understanding. Online resources and software applications have provided opportunities for students to manipulate sources, data, and information, engage in discussions, and create narratives in online environments. These tools have been successful in engaging students in disciplinary literacy practices, inquiry, and online publishing, but their use is limited to specific situations and specific tasks in the classroom. According to Staudt (2005) student’s casual use of technology actually impedes learning as students spend considerable time adjusting to new computers and applications. The prevalence of handheld and mobile devices in society and their use among students has broken down the barriers of technology use by students and opened the door to “ubiquitous portability” (Staudt, p. 6). Researchers have just begun to study and outline the potential benefits of mobile learning in and out of the classroom (Brand & Kinash, 2010, Hutchinson, Berschoner & Schmidt-Crawford, 2012; Traxler, 2009).

The term “ubiquitous computing” was popularly introduced by Mark Weiser in 1991, stating “that the most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it” (In Beck & Eno, p. 85). Weiser’s reality of technology weaving itself into everyday life has emerged with the use of handheld mobile devices and availability of high speed internet connections, and this reality exists for today’s high school students. Information Communication Technology (ICT) has
progressed rapidly and opened the door for fully integrated use of handheld mobile devices in the classroom. Van ’T Hooft and Swan (2004), in the observation of the Palm Education Pioneers Project, saw the integration of mobile technology into the curriculum to the point where it is was nearly invisible. The smaller and less disruptive the device, the more chance it stands of becoming a lifelong-learning tool anywhere, anytime (Inkpen, 2001; Sharples, 2000; Staudt, 2005; Traxler, 2009). Inkpen (2001) points out that mobile technology provides access to computing at the places where children’s activities and learning occur, not in distant labs and media centers. Social studies educators also need to embrace the potential of mobile devices as learning tools.

Researchers that have examined the use of mobile devices in learning agree that the definition is the pedagogical use of mobile device in teaching and learning (Brand & Kinesh, 2010; Hutchinson et al., 2012; Traxler, 2009). Staudt (2005) highlighted five big reasons mobile devices can transform education: they provide equitable access, intuitiveness, portable ubiquity, collaboration, and seamless interactions. Introduction of a mobile device into the social studies can enhance disciplinary literacy as students seamlessly interact with multimedia sources on a daily basis (Hutchinson et al, 2012). As November (2008) suggests, the use of mobile technology in literacy would meet a twofold purpose: giving students ubiquitous access to multiple types of text to increase understanding, as well as increase web literacy of students in a global age. November (2008) defines web literacy as the ability of students to responsibly navigate the vast array of information on the web, a skill that he sees as paramount in the 21st century digital world. This call to help students critically navigate online sources was echoed in Ladbrook and Probert’s (2011) study. Ladbrook and Probert found that high school students
lacked the ability to navigate web sources and analyze them effectively. The reality of students not being able to effectively navigate sources online for educational purposes was heightened by lack of instruction on how to do so in classrooms (Ladbrook & Probert, 2011). The ubiquity of mobile devices and their immersion in the classroom could encourage teachers to instruct students on critical analysis of web sources.

Another advantage of ubiquitous mobile technology is its ability to enhance collaborative learning (Beck & Eno, 2012; Staudt, 2005; Zurita & Nussbaum, 2004). According to Zurita and Nussbaum (2004), there are several weaknesses of face-to-face collaborative learning: namely, coordination, communication, organization of material, negation, interactivity, and mobility. Several early studies found that handheld mobile devices helped to overcome these weaknesses (Inkpen, 1999; Lundin & Magnusson, 2003; Zurita & Nusbaum, 2004). The ease of communication between devices can also enhance student to teacher collaboration (Staudt, 2005). Teachers can encourage students to use social media, blogs, and wikis to create and disseminate knowledge, and students can access their productions from anywhere and at any time. Learning and knowledge construction can be ongoing and collaborative with mobile technologies. Students could analyze, synthesize, and create knowledge without having to gain access to computers in labs or at home.

One-to-one Ratios and Learning Environments

Research on one-to-one technology use in American schools is relatively new. According to Warschauer (2011), one-to-one technology initiatives can promote a transformation of instructional practice and student learning. In the little research that is available, researchers
cannot agree on what one-to-one means in regard to pedagogy. Bebell and O’Dwyer (2010) make this clear when stating that “1:1 computing refers to the level at which access to technology is available to students and teachers; by definition it says nothing about actual educational practices” (p. 6). One-to-one initiatives seem to have varied purposes and goals across the schools that adopt them, as well as varied ways to fund the initiative (Bebell & O’Dwyer, 2010; Bebell & Kay, 2010).

While all researchers agree that one-to-one provides ubiquitous access to mobile or computer technology for every student, it may not have a direct effect on pedagogy or learning (Bebell & O’Dwyer, 2010; Lei, Conway, & Zhao, 2008; Shapely et al., 2010; Warschauer, 2007). Defining one-to-one can simply be the ratio of one device to one student, or it could be broadened to include the device as an extension of learning in and out of the classroom. A definition of one-to-one must include a vision where “laptop computers are not technological tools; rather, they are cognitive tools that are holistically integrated (Senge et al., 2005) into the teaching and learning processes of their school (Bain, 2007)” (Weston & Bain, p. 10, 2010).

Recent literature on one-to-one classrooms and schools have begun to define one-to-one technology use from an ecological perspective (Lei, Conway & Zhao, 2008; Spires, Wiebe, Young, Hollerbrands, & Lee, 2009; Spires, Oliver, Corn, 2012; Weston & Bain, 2010). Lei, Conway and Zhao (2008) define one-to-one as the interaction of technology, the classroom, and school within a series of interconnected parts that continuously affect one another. Spires, Oliver and Corn (2012) suggest that one-to-one technology has the potential to change the way the school, community, pedagogy, and learning interact within the school ecosystem. Spire et al. (2012) also states that one-to-one can change the ecosystem of the classroom, positioning the
teacher as a facilitator of learning, encouraging students as self-directed and self-regulated learners, providing immediate and constant access to information and tools, and generating relevant and personalized learning. The one-to-one ecosystem envisioned by Spires et al and others however, is dependent on the technology becoming seamlessly imbedded into the daily interaction of students, teachers, and the community (Spires et al., 2009; Spires et al., 2012, Lei et al., 2008). This seamless and ubiquitous use is made possible as technology has become mobile and accessible.

Student Voice Research

Research on student voice began to appear frequently in education literature after 1990, although Rudduck and McIntyre (2007) suggest that interest in student voice began in the 1960s. Much of the research before the 1990s in student voice was bound with critical theory in response to Paulo Friere’s *Pedagogy of the Oppressed*, first published in 1970 (Ruddick & McIntyre, 2007). Student voice was central in the exploration of the complex cultural structures that underlie teaching and learning, especially in regard to oppressive structures and norms present in Western schooling. Since the early work on student voice and critical theory, researchers have continued to explore and define voice in multiple ways. The purpose in student voice research varies, but the practice of “listening” to students and capturing their experiences in the classroom is at the core of student voice (Bragg, 2001; Cook-Sather, 2002, 2006; Fielding, 2004). Capturing the full diversity of student voice research is a difficult and daunting task, but it is possible to define student voice within the context of three philosophical camps: agency and emancipation, phenomenology and the lived experience, and constructivism and the search for meaning.
Student Voice as Agency

Much of the early work on student voice is framed within the context of critical pedagogy and critical theory. Critical theory bounds voice with agency, or the need to empower students to change and understand the structures that exist and oppress them. As critical theorists call attention to the inequities that exist in education, they hope to eliminate them (Segedin, 2012). Awareness of the structures that oppress can lead to change and agency for students that other forms of pedagogy cannot. According to Horkheimer (1982), critical theory seeks to “liberate human beings from the circumstances that enslave them” (In Segdin, 2012, p. 95). These circumstances are the racist, classist, and sexist structures that underlie education and schooling, and serve to undermine student self-worth and meaningful learning (Biddulph, 2011; Fielding, 2001, Lincoln, 1993; 1995). According to Lincoln (1993), liberation from oppressive structures emerges in the “silenced becoming the producers, analysts, and presenters of their own narratives,” thus ceasing to be objects of their experiences, and instead “agents and instruments of their own change processes” (p. 43). As agency and change are key concepts in critical pedagogy, researchers that employ critical theory are most prominent in school reform research.

The voices of students are often overlooked in the process of school reform and curriculum change. Students are heavily influenced by change in schools and classrooms, but are rarely consulted when adults decide to “improve” educational institutions and practice (Armstead, C. et al., 2010; Cook-Sather, 2002; Hargreaves, 1996; Storz & Hoffman, 2013). In her study of “at-risk” students in Ontario, Lauren Segedin (2012) employed a critical theory framework to understand the factors that undermined at-risk students’ success in school.
Segedin’s mixed methods approach compiled 61 surveys of students, and she conducted interviews of four at-risk students of varied socio-economic and academic backgrounds. In her data, Segedin was searching for the curriculum structures in school that students cite as limiting their success and motivation. She found that at-risk students perceive limitations from the school curriculum, teacher expectations, and self-blame. These limitations are imposed on them by school structures that confine at-risk students to particular classes and expectations (Segedin, 2012). Segedin’s work highlights the goal of critical theory in helping educators and students understand the socio-cultural structures in schools that limit their success.

While understanding the structures in school and society that confine student learning and success is essential to critical theorists’ approach to student voice, much of the literature also points to developing agency from student voice. Research on student voice that promotes agency asks that student voice be used to change the classroom and school (SooHoo, 1993; Cook-Sather, 2006). Ruddick and McIntyre (2007) maintain that “what teachers do for their pupils can be significantly enhanced through listening to pupil voices only if these voices influence what happens in classrooms” (p. 23). Listening to students and affording them a place in research and reform of schools and classrooms allows students to actively shape their education (Cook-Sather, 2006). In their study of urban high schools, Friend and Caruthers (2012) engage in student voice research in an attempt to generate discussion on how to “reculturate” urban schools with student input. Friend and Caruthers taped interviews with 28 urban high school students and observed student interactions with teachers, administrators, and peers in two urban high schools. Friend and Caruthers found that students wanted an avenue to display agency in their school and wanted a say in “educational opportunities and experiences”
While Friend and Caruthers’ study does have the same limitations of many qualitative designs, such as small sample size and generalizability, it supports the importance of including student voice in school reform.

**Student Voice as Phenomenology**

Exploration of student voice is also prominent in phenomenological studies, as researchers attempt to uncover the “lived experience” of students. According to Pinar (2008) phenomenology attempts to explore those who live in the “here and now of a situation” (p. 412). “Situation” is the setting in which individuals create and form meaning, meaning in this sense is “situationally understood and communicated” (Pinar, 2008, p. 412). The reality of classroom life is the construction of those who live in that situation (Aoki, 1988). Student voice is central to understanding the situation of the classroom and uncovering the lived experience of students. The essence of the classroom experience is the curriculum that shapes the interactions between individuals and groups in the classroom.

Pinar (2004) defines curriculum as a complicated conversation, which implies that there is more than one voice involved in the classroom “situation.” Thinking of curriculum as a conversation suggests that student voice is just as important as the teacher’s voice in classroom dialogue. Ayers (1990) explains that the effort to understand curriculum involves two audiences, the children and their families first, and the educators, policymakers, and stakeholders second. If curriculum, as Ayers suggests, is a conversation between two audiences then student voice research needs to be encouraged in education discourse. In his study of urban elementary students, Ayers argues that “what is missing in the research literature is the experience of crisis:
the insider’s view” (p. 271). To Ayers, the insider is the student. If student voice is vital to the classroom conversation, then the student must be allowed to speak, and be listened to. To phenomenological research and student voice, a students’ voice carries with it experiences and understandings that are important to the unique situation of a classroom.

Much of the literature has argued that students’ “lived experience” in school, outlined by an exploration of student voice, deserves a more prominent place in research (Ayers, 1990; Bernhardt, 2009; Lincoln, 1993; Garcia, 2006). In their study of a one-to-one initiative in an urban middle school Storz and Hoffman (2013) cite the importance of “elevating” student voices to the analysis of school curriculum initiatives (p. 3). Storz and Hoffman conducted an extensive phenomenological study of middle schoolers’ beliefs and experiences with the use of laptops in their learning. Forty-seven students were interviewed in two phases, and two sets of focus groups were utilized with three to five students per focus group. Storz and Hoffman’s study was conducted over the course of one school year and they found that a one-to-one initiative encouraged student collaboration with peers. Also, Storz and Hoffman found there was increased student-teacher communication and one-to-one ratios encouraged less direct instruction. Although designated a phenomenological study by Storz and Hoffman, it is difficult to see where they captured the lived “situation” outlined by earlier theorists in phenomenology and student voice. Storz and Hoffman fail to capture what Patton (2002) explains as the “inner essence of the experience… of being a participant in a particular program.” (p. 71).

One of the benefits of student voice work and phenomenology is that the research can be carried out with unique and varied methods. In her study of high school students’ perceptions and beliefs about the No Child Left Behind’s (NCLB) definition of a “highly qualified” teacher,
Garcia (2006) asked students to take a four-month discussion and writing class on the characteristics of “highly qualified.” At the conclusion of their four-month class Garcia asked the students to write a letter either to a current instructor, or to a new teacher. The letters were to be a personal reflection of what it means to be highly qualified according to NCLB, and what it means to be highly qualified to the student. In her analysis of the four students’ letters and personal reflections, Garcia is able to extract a shared experience of what students perceive as a “highly qualified” teacher. Garcia used autobiography to capture the “lived experiences” of high school students. Autobiography can be a powerful research tool in analyzing student voice and accomplishing the goals of phenomenological research (Ayers, 1990; Pinar, 2008).

Patton (2002) defines phenomenological research as outlining a quintessential element of the human experience. According to Merriam (2009) phenomenological research is best suited when “studying affective, emotional, and often intense human experiences” (p. 26). An example of this type of research was conducted by Raider-Roth (2005) in her analysis of student voice and trust in middle school students’ perceptions of self-assessment. Trust was the quintessential experience sought by Raider-Roth, trust both from peer to peer and student to teacher relationships. Raider-Roth interviewed six middle school students who had a long academic history with self-assessment and found that trust was relational to audience in self-assessment. Although limited, as the study focused on students who used self-assessment from the very beginning of their educational experience, Raider-Roth’s research highlights the benefits of phenomenological student voice work in examining specific aspects of the student experience.
Student Voice in Constructivism

While many researchers have attempted to use student voice to capture the lived experience of students, others have used student voice to examine the ways in which students construct meaning from their classroom experiences (Brooker & MacDonald, 1999; Hay, 2009; Mitra, 2004; Moses, Howe, & Niesz, 1999; Rop, 1999). The notion that underlies constructivist approaches to student voice research is that meaning is socially constructed, and how students perceive curriculum, learning, the classroom, or reform is a product of shared cultural norms in school (Hay, 2009; Rop, 1999). According to Lincoln (1995) constructivism has contributed to student voice research in that it recognizes the concept of multiple realities, and student reality does not necessarily “reflect the view of the dominant majority (adults who have power over them).” (p. 90). Understanding the ways in which students construct meaning and experience schooling is essential, as listening to what students have to say can improve teacher practice (Cook-Sather, 2006). Student voice research within the framework of social constructivist notions of shared meaning are the third philosophical camp that encourages student voice research.

The central source of data in phenomenological student voice research is student interviews, focus groups, or other sources of text produced by the student. However, student voice in a constructivist methodology can borrow from phenomenology, ethnography, and symbolic interactionism (Merriam, 2009). In his study of high school chemistry classes, Rop (1999) used observations and focus groups to understand student perspectives on success in high school chemistry. Rop found that students perceive their success in chemistry within five overlapping cultural spheres of influence: peer culture, family influence, institutional influence,
teacher’s influence, and subject matter. Each cultural sphere of influence, according to Rop, could also be observed in student actions during chemistry class, not solely in their perceptions of what it means to be a successful chemistry student. While limited to high achieving students in one high school, Rop’s research supports the notion that student perceptions are socially constructed, and exploring voice is one avenue to understand students’ shared experience.

As researchers use student voice to understand the experiences and perceptions of high school students, the appearance of students’ socially constructed meaning is often made apparent in the findings (Hay, 2009; Lowe, 2010; Rop, 1999). In his study of two Australian high schools, one a public school in a low socio-economic area, and the other an “elite” private school, Hay (2009) found that student experiences and perspectives of “schooling” were very different. Hay interviewed 12 students, six from each school, over an exhaustive 20-week period. After analyzing the data, Hay found that students differed in three major areas: pressure to perform, competition, and the significance of the subjects taught. Students in Hay’s study shared common experiences in each school, but their experiences differed between schools, suggesting that student experience is socially constructed. According to Hay, the significance of the findings is that uniform macro school initiatives and reforms cannot address the unique cultural make-up of individual schools.

The Challenges of Studying Student Voice

The exploration of student voice in educational research is not without difficulties (Fielding, 2004). Understanding how students construct meaning implies that there is trust between the researcher and the student, or the teacher and the student (Cook-Sather, 2006;
Many students feel powerless in the school setting and will be reluctant to honestly express their voice (Mitra & Gross, 2009; Smyth, 2006). Fielding (2002) maintains that the spaces in which students can share their voices are often micro-managed by adults interfering with trust. Students need to have safe and encouraging spaces where they can speak out about what is important to them (Bernhardt, 2009; Cook-Sather, 2006; Smyth, 2006).

Another danger of adults exploring student voice is the tendency to speak for students, rather than listen to students. Fielding (2004) suggests that “teachers, researchers, parents, and adults in general speak too readily and too presumptuously on behalf of young people whose perspective they often misunderstand and, in many contexts, frequently disregard” (p. 123). Also, student voice is interpreted through the adult lens of the researcher, and the lens of the particular school or institution the teacher or administrator is working in (Fielding, 2004; Lincoln, 1995). This tendency reduces student voice to adult perceptions of student’s words, which may inadvertently be used to reinforce the already dominant position of the researcher, teacher, administrator, or dominant norms of the school (Lincoln, 1993). When student voice is used to reinforce dominant values and norms it ceases to fully explain student constructs of meaning and knowledge (Fielding, 2001, 2004; Cook-Sather, 2002). Many researchers have begun to include students as co-researchers to alleviate some of the problems associated with analyzing student voice (Fielding, 2004; Kirshner & Pozzoboni, 2011; Mitra, 2001; SooHoo, 1993).

Researcher’s interested in more student involvement in the analysis of student voice data often suggest that students should participate in inquiry about institutions that influence their lives (Cammorota, 2008; Fielding, 2001, 2004). According to Mitra (2001), when “adults
analyzed the data, they translated student speak into adult words that did not always have the same meaning” (p.92). Employing student researchers to interpret meaning in the data is essential to capturing student voice as adults often misinterpret or misunderstand student perspectives (Fielding, 2004). Recent studies have utilized student researchers when analyzing the data compiled in interviews and focus groups (Kirshner & Pozzoboni, 2011; Mitra, 2001).

In her research on school reform efforts in California, Mitra (2001) studied two high schools that decided to include student voice in reform efforts. In one of the high schools the data from student surveys and focus groups was examined and analyzed by teachers and administrators in order to understand student perceptions of school reform initiatives. In another high school Mitra (2001) advised the school to include students not only as participants, but co-researchers when analyzing the data. Mitra’s inclusion of students into the analysis of focus group data minimized the problem of adults misinterpreting student voice. Student co-researchers would assist in data analysis to ensure that student voice is not consumed by adult realities.

In another study on student voice in school reform efforts the role of students in research was increased, not only interpreting the data, but conducting peer interviews (Kirshner & Pozzoboni, 2011). In their research on student perceptions regarding school closure Kirshner and Pozzoboni had student co-researchers conduct peer interviews and peer led focus groups. In utilizing student co-researchers Kirshner and Pozzoboni were attempting to alleviate the issues of trust and authority that often undermines student voice data. Student co-researchers also engaged in analysis of the survey and focus group data in order to address the potential for adult perceptions of student voice to undermine the findings. Kirshner and Pozzoboni suggest that
students in interviews and focus groups led by peers were less likely to restrain their opinions and engaged in a more natural dialogue during the interview process. The limitation of the approach used by Kirshner and Pozzoboni was the school closure issue being studied was volatile and student co-researchers entered the project with a powerful bias concerning the decision to close their school. It was acknowledged that the researchers were not able to fully address this bias in their research (Kirshner & Pozzoboni, 2011). Despite its limitations, the use of co-researchers by Kirshner and Pozziboni is an interesting approach to capturing student voice.

Conclusion

The purpose of this literature review was to examine research on social studies inquiry, technology use, and student voice. Past research in the social studies outlines decades of work by researchers and classroom teachers to implement inquiry and technology, often with limited success. The research also suggests a continued desire by many researchers, agencies, and groups to embed inquiry and technology into the classroom. Much of the research however, does not address whether technology, specifically mobile technology, can mediate inquiry to the point of shaping how students access and retain knowledge. There also seems to be a need for research that examines student voice in the use of mobile technology and inquiry in the social studies. Considering that much of the research has neglected the examination of how well technology and social studies inquiry complement each other, and the role of student voice in understanding the relationship between the two, the research conducted for this study has merit.
CHAPTER 3

METHODOLOGY

Introduction

As schools continue to deal with multiple initiatives that influence the way students learn and interact in the classroom, studies that examine the experiences of students are important (Brooker & MacDonald, 1999; Storz & Hoffman, 2013). Also, as interest groups, standards, and organizations demand that students use technology to engage in inquiry, an understanding of how students construct meaning through inquiry and technology is important (Beck & Eno, 2012; Zucker & Hug, 2008; Zurita & Nusbaum, 2004). The purpose of this study was to examine the voice and experiences of high school students, and how high school students construct meaning through inquiry and mobile technology in the social studies classroom. This chapter discusses the design, participants, data collection, data analysis, validation procedures, and limitations of the study.

Research Questions

1) How do high schools students voice their experiences in a technology rich, inquiry driven, social studies classroom?

   a.) In what ways do students use mobile technology in social studies inquiry?

   b.) How do high school students construct meaning from social studies inquiry using mobile technology?
Research Design

This study examined student voice in history classrooms that have employed both social studies inquiry and the use of mobile technology. Since detailed description of student experiences with social studies inquiry and mobile technology use is the goal of the research, a qualitative design is needed. According to Mertens (2014), “qualitative methods are used in research that is designed to provide an in-depth description of a specific program, practice, or setting” (p. 236). Yin (2008) also states that qualitative research allows researchers to explore an individual’s or organization’s interaction with complex interventions, relationships, communities, or programs. An analysis of student voice in an inquiry driven technology rich classroom agrees with Mertens' and Yin’s rationale for conducting qualitative research.

Merriam (1998) states that the philosophical assumption “upon which all types of qualitative research are based is the view that reality is constructed by individuals interacting with their social worlds” (p. 6). Constructivism, the epistemology that knowledge is created from the interaction of an individual’s ideas and experiences underscores many approaches to qualitative research. The constructivist paradigm supports the premise that truth is relative and socially constructed within a particular time and context (Mertens, 2013). The theoretical assumption for this research is that a student’s reality is a result of the social context in which it is placed.

The notion that underlies constructivist approaches to student voice research is that meaning is socially constructed, and how students perceive curriculum, learning, the classroom, or reform is a product of shared cultural norms in school (Hay, 2009; Rop, 1999). According to
Lincoln (1995) constructivism has contributed to student voice research in that it recognizes the concept of multiple realities, and student reality does not necessarily “reflect the view of the dominant majority (adults who have power over them)” (p. 90). Understanding the ways in which students construct meaning and experience schooling is essential, as listening to what students have to say can improve teacher practice (Cook-Sather, 2006).

Schools are experimenting with the use of mobile technology, and many social studies and educational technology organizations are encouraging the use of inquiry, thus the high school students that are the focus of this study were situated in a specific social context. The site for this study situated students into classrooms with one-to-one mobile technology, and the teachers that participated in this study engaged their students in what they considered to be social studies inquiry. This context is new to many students and understanding how they construct meaning and engage in inquiry with mobile technology was the goal of this study. In order to better understand the human condition and experience, qualitative research seeks to understand the processes by which people construct meaning (Bogdan & Biklin, 2007).

According to Yin (2008), when the focus of the study is to answer “how” and “why” questions the best approach is a case study. A case study is defined as an approach to research that explores a phenomenon within a particular social context, and possesses the potential to employ a variety of data sources (Creswell, 2007; Merriam, 1998; Mertens, 2014, Yin, 2008). A case study is also useful when the researcher wants to explore an issue within a bounded system or particular setting (Creswell, 2007; Merriam, 1998; Yin, 2008). As this study attempted to understand the influence of inquiry and mobile technology on students in a particular case, the case study method was the best qualitative approach.
A case study can be presented in multiple ways: observational, historical, document based, explanatory, exploratory, and descriptive (Bogdan & Biklin, 2007; Yin, 2008). The approach for this research was descriptive. Yin (2008) states that a descriptive case study attempts to describe an intervention or phenomenon in the real-life context in which it occurred. The focus of this research was student experiences in specific classroom settings, which meets the criteria established by Yin (2008) for a descriptive case study.

The Case

The 109 participants spanned three grade levels in two different teachers’ classrooms. The high school where the participants were enrolled adopted a one-to-one initiative in which all students were given a handheld tablet, and all teachers were asked to implement the use of the tablet into their classroom. The social studies classrooms also introduced social studies inquiry based lessons into their classrooms in order to meet national, state, and district standards.

The School Setting

The school setting for this case study was a large high school in suburban Chicago with a total enrollment of 2,295 students. For reasons of confidentiality, the school associated with this study is referred to as South High School. South High School is part of a High School District that includes five high schools, and has a total district enrollment of 12,019 students (IRC, 2015-2016). In the 2012-2013 school year the district decided to experiment with the implementation of mobile devices (iPad) in the classroom and one-to-one ratios. In the first pilot year 12 teachers were chosen to provide a one-to-one environment for their students. In the
second year of the pilot, 25 more teachers across the district, guided by the initial 12 pilot participants, were chosen to provide a one-to-one environment in their classrooms. Following the two pilot years and an initiative by the district to update the infrastructure needed to make one-to-one environments a part of all district schools, a mobile device was provided to every student for the 2014-2015 school year.

All teachers were encouraged to use the devices in their classrooms to engage students, manage files, and present lessons. The school’s district did not dictate that every teacher should implement the mobile devices holistically into the classroom, but rather experiment with various ways to use the device in instruction. Many teachers used the devices to manage files and communicate with students and parents, but did not use the device as an instructional tool. Several teachers have adopted the device as a tool to deliver content and incorporated it into daily lessons. In many cases these teachers abandoned traditional textbooks, harnessed the internet for content and asked students to use the devices in and out of the classroom. The majority of teachers in the school however; are in the middle of these two extremes, reluctant to depend solely on the device, but willing to experiment with its capabilities. This case study was conducted in the second school year of the full roll out of mobile devices to students.

South High School was chosen for this case study for three reasons. One, the high school was part of a larger district-wide project to utilize a one-to-one environment in the classroom. Two, South High School had several social studies teachers that were committed to using inquiry in their classrooms. The third reason is convenience, as the researcher was employed by the school and assisted many teachers in the use of social studies inquiry through teacher leadership and professional learning teams.
South High School has enjoyed above average success on state tests and assessments (IRC, 2015-2016). The school is situated in a traditionally middle-class community, with 32% of the students designated as low income (IRC, 2015-2016). Of the 2,295 students at South High School, 52.5% are Caucasian, 21.2% are Hispanic (the fastest growing population), 15.3% are Asian, 6.5% are African American, and Native American, Pacific Islanders and mixed ethnicity students comprise the remaining 4.6% (IRC, 2015-2016).

Role of the Researcher

The researcher for this project taught history at the school for 16 years, primarily World History and Advanced European History. The researcher led the World History curriculum team for ten years and served on multiple curriculum committees for the school and district. The researcher was a member of the second round of pilot teachers for the iPad initiative in the school and have worked to include mobile technology into all facets of teaching and learning. The researcher led an initiative in the World History team comprised of four other World History teachers, two from South High School, and two from another high school to implement inquiry learning into the curriculum. The World History Team worked to develop a curriculum that includes sound inquiry that still meets the standard requirements of district, state, and national mandates. The curriculum that will be the center of this study was part of the World History Team’s efforts, and was implemented into a US History classroom for the first time.

The researcher worked with both participating teachers on the World History Team for eight years. The World History Team collectively led many curriculum changes under the researcher’s leadership of the World History Team. The two participating teachers have a
cooperative and professional relationship with the researcher and the team was honored by the school on several occasions as an exemplary professional learning team. The students that participated in this study were not familiar with the researcher outside of a general member of the staff. The researcher did not include students that were current members of his class, or students that were in the researcher’s class in the past.

**Classroom Setting One**

The first instructor for these studies, Mr. Dimah (for reasons of confidentiality, both instructors chose their own pseudonym for this research study) taught at South High School for 11 years and was one of the original pilot members of the mobile technology initiative in the district. Mr. Dimah was fully invested in the use of technology and the one-to-one environment. Mr. Dimah abandoned traditional textbooks in his classroom, delivered content on the student’s mobile devices, communicated on the mobile devices in and out of school, and used the internet and technology resources for students to work on assignments at all times. Mr. Dimah also adopted the use of the 21st century classroom for his classes. A classroom that situated students at tables with access to monitors that could connect directly to their mobile device. Students were always sitting in small cooperative groups and individual desks were non-existent in Mr. Dimah’s classroom. Mr. Dimah was a part of the researcher’s professional learning team and committed to the introduction of social studies inquiry into his 11th grade United States History class. Mr. Dimah taught one US History class of 30 students (19 males and 11 females) and one US History class with 25 students (12 males and 13 females).
Classroom Setting Two

The second instructor, Mr. Jordan, was employed in the district for 15 years and adopted the use of the mobile devices in the classroom at the behest of the district in the final roll out of the program. Mr. Jordan was reticent in the face of so much change and not as comfortable using technology in his classroom. Mr. Jordan often mixed technology resources with older more traditional resources. Mr. Jordan used an online classroom website to manage files and deliver content to students, but he did not regularly use the device to communicate, did not ask students to complete work on their devices if they chose not to, and did not abandon an occasional use of traditional textbooks. Mr. Jordan’s two classes were mixed 9th and 10th grade students with individual desks organized in a “U” shape in the classroom. Mr. Jordan often asked students to move desks and work with others, but preferred the traditional individual desk to tables. Mr. Jordan had one World History class of 28 students (18 females and 10 males) and one World History class of 26 students (14 males and 12 females).

20Time

In the summer leading up to this study both classrooms adopted an initiative to institute “20Time” projects in their classrooms. 20Time as a title was chosen by the instructors because work on the project would constitute 20% of a students’ time in the classroom per quarter. 20Time was designed to give students the opportunity to engage in inquiry over an extended period of time. Significant latitude was given to the student on the nature of the project, as long as the student could provide historical perspective and context during the process. Mr. Jordan asked students to give a report on the historical context for their project at the beginning, while
Mr. Dimah asked students to include historical perspective into their weekly blogs. Students were asked to choose a topic, design an inquiry, compile research connected to their inquiry, and communicate the outcomes of their inquiry at the end of each quarter. Students were also asked to create a blog that embodies their project, or personality, and reflect once a week on their progress. Each teacher designed a unique set of reflection tasks for their classroom. The outcomes of many 20Time projects are discussed in the findings of this study.

Participants

The participants for this study were observed and drawn from the four history classes described above (two 11th grade US History classes, and two 9-10th grade World History classes) in the social studies department of South High School. Purposeful sampling techniques were used to identify participants for this study. As these case studies were bounded by a specific phenomenon, a purposeful sample was used to ensure the characteristics of the classroom needed for the study were present. The observed classrooms were accessible to the researcher and utilized both mobile technology and inquiry instruction.

The high school students that comprised Mr. Dimah’s and Mr. Jordan’s classes were males and females aged 14 to 17 years old. US History is required for all 11th grade students at South High School, and students must choose between remedial, traditional, advanced US History, or American Studies when registering for classes. World History is an elective course at South High School that 35% of students choose to take in order to meet their credit requirement for graduation or admission to a university. World History courses are open to all students, but typically only ninth and tenth grade students take the course. There is approximately an equal
number of ninth and tenth grade students in every World History classroom. The students have a broad range of academic, socio-economic, and ethnic backgrounds.

Of the approximately 109 students observed in the four classes, 20 students participated in four focus groups and 9 students out of the focus groups sat for personal interviews. Participants in focus groups and interviews were chosen using purposeful sampling for maximum variation. Maximum variation is sampling to account for the widest possible range of characteristics of interest in a study (Merriam, 1998). Maximum variation is useful when the sample size is small and maximizes the likelihood of providing different perspectives (Creswell, 2007). According to Creswell, reflecting difference and analyzing different perspectives is an “ideal in qualitative research” (p.126).

Data Collection

For this case study three types of data were collected to address each of the research questions. It is preferred, when doing case study research, that at least three types of data are collected for triangulation (Merriam, 1998; Yin, 2009). Table 1 highlights the data collection strategies used in this case study as well as the timeline used for collecting the data. Although focus groups are listed separately in Table 5, they are considered one type of data along with personal interviews in this study (see Table 5).
Table 5
Data Collection Tools, Timeline, and Research Questions

<table>
<thead>
<tr>
<th>Data Collection Strategy</th>
<th>Phase 1 Dec. - Feb.</th>
<th>Phase 2 Feb.-May</th>
<th>Research Questions</th>
</tr>
</thead>
</table>
| **Classroom Observations** | Dec. Two observations of each social studies classroom were conducted. Four observations total. | March Two observations of each social studies classroom were conducted. Four observations total. | • In what ways do students use mobile technology to mediate social studies inquiry?  
• How do high school students construct meaning from social studies inquiry using mobile technology? |
| **Focus Groups** | Jan. - Feb. Two focus groups were conducted. One focus group was comprised of eight students (five males and three females). The other focus group was comprised of nine students (six females and three males). | April *Two more focus groups were conducted. One focus group was comprised of seven students (four females and three males). The other focus group was comprised of six students (four females and two males). | • How do high school students describe their experiences in a technology rich, inquiry driven, social studies classroom?  
• In what ways do students use mobile technology in social studies inquiry? |
| **Personal Interviews** | Jan. - Feb. Personal interviews of six students from both social studies classrooms. Three students from each teacher’s classroom. | April - May Personal interviews of six students from both social studies classrooms. Three students from each teacher’s classroom. Three students did not participate in the first phase of interviews. | • How do high school students describe their experiences in a technology rich, inquiry driven, social studies classroom?  
• In what ways do students use mobile technology in social studies inquiry? |

(Continued on following page)
Table 5 (continued)

<table>
<thead>
<tr>
<th>Data Collection Strategy</th>
<th>Phase 1 Dec. - Feb.</th>
<th>Phase 2 Feb.-May</th>
<th>Research Questions</th>
</tr>
</thead>
</table>
| Documents: Student Work  | Dec. - Jan. Examples of student work from inquiry based lessons will be collected and analyzed from both social studies classrooms. | March - May Example of student work from inquiry based lessons will be collected and analyzed from both social studies classrooms. | • In what ways do students use mobile technology to mediate social studies inquiry?  
• How do high school students construct meaning from social studies inquiry using mobile technology? |

* Three of the students did not participate in the first phase of focus groups.

**Observations**

The goal of observations was to collect data in the classroom and understand the ways in which students interacted with inquiry and technology in a natural setting. In this study, the researcher’s activities were known to the participants, but participation was secondary to observation (Merriam, 1998). The goal of the researcher was to observe and interact without participating.

Two sets of 45 to 50 minute observations were conducted from December 1, 2015 to May 15, 2016. Each set of observations included two observations of Mr. Jordan’s World History courses and two observations of Mr. Dimah’s US History courses. The specific class dates chosen for the observation were determined by the teacher’s use of inquiry in their classroom. The length of observations was also determined by the nature of the inquiry lesson students are engaged in.

When conducting each observation, the researcher utilized an observational protocol. According to Creswell (2007) an observation protocol aids the researcher in organizing
descriptive notes during fieldwork. The observation protocol for this case study (Appendix A, Appendix B) was adapted from Creswell’s (2007) *Qualitative Inquiry & Research Design*.

**Focus Groups & Personal Interviews**

Two types of interview data were collected for this study, focus groups and personal interviews. Two phases of two focus groups containing six to nine students, were conducted over the course of the school year. Focus group discussions were conducted in two phases with the primarily the same group of students, however three students who did not participate in the first phase joined the focus group in the second phase. Focus groups were held in January/February of 2016 and in April of 2016, each will run approximately 45 to 60 minutes. Students volunteered for focus groups out of the four history classes with the goal of having an equal number of participants from each teacher’s classroom. There were 20 students that participated in the focus group discussions and 12 were from Mr. Dimah’s US History class and eight were from Mr.’ Jordan’s World History class.

As students were introduced to the study at the beginning of the school year by the researcher parental consent was sent home with the students. Students were asked to get parental consent to be a part of the study, and parents received a letter from the researcher explaining the study and encouraging parents to contact the researcher with any questions or concerns. Students were encouraged to volunteer for focus groups out of their social studies classroom. Focus groups were conducted after school hours on days in which bus transportation was provided for after school activities.

The researcher entered the focus groups with questions to elicit a natural discussion about
student use of technology and inquiry in the classroom. The benefit of focus groups was to observe the social dynamics of the participants during the discussion as well as the interaction of ideas (Merriam, 1998). In order to guide focus group participation and to ensure observation of both dialogue and interaction, a protocol was followed (Appendix B). According to Creswell (2007), an interview or focus group protocol is important to assist the researcher in organizing notes and moving the discussion along.

Focus groups were primarily facilitated by student co-researchers in order to alleviate many of the problems with conducting student voice research from a position of authority (Fielding, 2004; Kirshner & Pozzoboni, 2011; Mitra, 2001; SooHoo, 1993). Student co-researchers were chosen at the beginning of the school year out of social studies classes. The student co-researchers in this study were three 12th grade high school students that had an interest in social or behavioral sciences. Student co-researchers were interviewed by the researcher, chosen for their leadership traits, their ability to communicate with faculty and peers, and underwent instruction on interview and focus group techniques before they participated in the study. Student co-researchers used the focus group protocol, assisted by the researcher, to lead the focus group discussion.

Nine students volunteered out of the focus group discussions to sit for in depth interviews. There were two phases of interviews over the course of the school year, with six students interviewed January 2016 - February 2016, and the same six students interviewed April 2016 - May 2016. Three of the students that sat for interviews in the first phase did not sit for interviews in the second phase. Each interview ranged from 30 to 45 minutes. An interview protocol was used for both phases of personal interviews conducted by the researcher (Appendix
C). All personal interviews were completed during the school day, excusing students from lunch, study hall, or their social studies class period.

**Documents: Student Work**

Student work completed in the process of engaging in social studies inquiry and technology use was collected throughout the 2015-2016 school year. According to Merriam (1998), documents should be collected in case study research when they are relevant to the research questions and easily accessible. Student work can reflect student use of inquiry and technology in the social studies classroom and obtaining the documents was easily achieved by the researcher, meeting the criteria established by Merriam. Physical artifacts and documents are underused in qualitative research, but have the potential to develop a broader perspective on a case (Yin, 2008). The benefit of collecting student work is that, unlike observation and focus groups/interviews, it is not influenced by the presence of the researcher, and can provide a more objective form of data (Merriam, 1998). Examples of student work relevant to the observations conducted in each classroom were requested from Mr. Dimah and Mr. Jordan. For this case study, 40 examples of completed projects, daily inquiry activities, and cooperative work were collected.

**Data Analysis**

This section will discuss the data analysis procedures of the research. First, a description of the transcription process will be outlined. Second, the coding procedures used by the researcher when analyzing the multiple forms of data collected will be explained. Finally, a description of the member checks employed in the case studies are highlighted.
Transcription Procedures

Three types of data were transcribed by the researcher. Field notes of observations were transcribed as soon as possible following the observation of a class. According to Bogdan and Biklin (2007), field notes should be transcribed as soon after the observation as possible to ensure proper recall and accuracy. Using the notes compiled in the observation protocol (Appendix A) the researcher sat down and transcribed his handwritten notes into a word processing file.

Focus groups and interviews were recorded with a high quality digital voice recorder, and were also transcribed by the researcher into a word processing file. As suggested by Bogdan and Biklin (2007), the comments of each participant marked the start of a new line in the transcription process and long remarks or monologues were broken down into paragraphs to aid in the coding process. Editing of names into pseudonyms chosen by the students was done to ensure confidentiality. As this case study produced a significant amount of data, the data was stored and organized into one file to facilitate an easily accessible depository for all data types. According to Merriam (1998), this step is essential to proper managing of the amount of data case studies produce.

Coding Procedures

Following the transcription process and the organizing of data into a manageable database, the data was coded and analyzed. In case study analysis, the best approach is to stay grounded in the research questions, as case studies produce an extensive amount of data to
manage (Yin, 2008). Qualitative analysis also occurs at several levels or steps in analysis, but the number of steps can be unique to each researcher (Bogdan & Biklin, 2007; Creswell, 2007; Maxwell, 2005; Mertens, 2014). This research study was conducted with three levels of analysis. The levels of analysis were organizational, substantive, and theoretical (Maxwell, 2005). Following the coding procedures, the researcher moved to creating what Creswell (2007) explains as “naturalistic generalizations” about the cases.

The organizational step of the coding process occurred throughout the data collection process. Creswell (2007) views the data analysis approach in qualitative research as a spiral in which each layer of data collection, organizing, and analysis are carried out simultaneously. The organizational step of analysis used prescribed categories to group the data into manageable chunks for future analysis. Maxwell (2005) explains this step as “bins for sorting data for further analysis” (p. 97). The researcher coded each data set as it was transcribed and compared it to the next data set in the collection phase, in an effort to sort all data into common categories. For example, immediately after transcription was completed the researcher sorted data according to how they addressed each of the research questions, this process focused the organizational step and reduced the number of categories developed. Sample codes in this step included: statements connected to inquiry, statements connected to mobile technology, statements connected to social studies, and statements connected to learning.

The substantive analysis of the data took all the data and created descriptive categories that reflected the actual words, actions, and experiences of the participants. Maxwell (2005) defines this stage as “staying close to the data organized, and does not imply any abstract theory” (p.97). The researcher categorized major themes in the data that addressed the research
questions in this phase, but ensured they still reflect the beliefs and concepts of the participants. For example, themes included: access to information during inquiry, communication with group during inquiry, or tools on the iPad that aided inquiry. The goal of this phase was to further reduce the categories to a more manageable data set for the final step of analysis.

The final step in the analysis phase was theoretical. In this phase, the researcher applied a theoretical concept to the data. The researcher addressed each of the research questions with broad categories of themes that reflected the conceptual framework of the researcher. Elements of the C3 Framework for inquiry and the New Learning Ecology were identified as the researcher situated the data into theoretical categories. For example, in this research theoretical themes might include: students often embraced the availability of resources and information when planning and doing inquiries and students discussed the positives and negatives of communication with mobile devices. According to Maxwell (2007), this step in the analysis highlights the researcher’s concepts, and moves to “etic categories” (p. 97). The final phase of analysis will also reduce the data into a manageable number of broad themes or theoretical concepts. Creswell (2007), recommends no more than five themes grounded in theoretical propositions or research questions in case study research. The analysis for these studies reduced the data into four themes.

The goal of this descriptive case study was not to develop theory, but provide an example of student experiences with inquiry driven technology rich classrooms. Analysis will lead to “naturalistic generalizations from the data, generalizations that people can learn from the case either for themselves or to apply to a population of cases.” (Creswell, 2007, p. 163). The themes and generalizations found in this research are discussed in chapters four and five.
Member Checking and Triangulation

Two validation checks were imposed on the data analysis for this study. The first strategy was member checking of observation notes by the teachers in the classroom and of transcripts by student co-researchers. The second was triangulation through the use of multiple types of data.

Member checks are used in qualitative research to aid in the validation of what is stated by the participants in the study. According to Maxwell (2005) member checking is the single most important strategy for verifying that the researcher has not misinterpreted the views of participants. Two types of member checks were conducted in this study. First, the instructors in the classroom during the observation were asked to review the typed observation notes recorded by the researcher as soon as possible after the observation. Member checks can be both an informal or formal process (Mertens, 2014). Member checking of observations were formal and guided by prescribed questions developed by the researcher (Appendix D). The responses to the questions were discussed with the observed teachers to ensure that there was nothing misinterpreted by the researcher. Member checks were also used for focus groups and interviews. Student co-researchers were integral to all interviews and focus groups. Student co-researchers assisted the researcher in analysis to ensure that the student voice was not interpreted wholly though an adult lens, a major pitfall of student voice research (Fielding, 2004; Lincoln, 1995). Student co-researchers also reviewed the transcribed notes of interviews to validate that student voices were not misinterpreted by the researcher.

The second validity check was triangulation. The benefit of case studies is their access to
and use of multiple forms of data (Yin, 2008). This research was compiled from multiple methods: observations, interviews, and documents. Each type of source was analyzed and coded with the three-step process outlined earlier in this chapter. Themes generated by the researcher was supported from all three types of data. The data collection and analysis will meet the requirement for triangulation.

Conclusion

This descriptive case study was conducted using qualitative procedures and research techniques. The participants for this study were high school students from two history classrooms in a large suburban high school. The data was analyzed in order to generate themes that provide a rich description of the case. The analysis reflected the experiences of high school students in inquiry driven technology rich history classrooms. The next chapter examines the findings of the research.
The purpose of this study was to examine the voice and experiences of high school students, and how high school students construct meaning through inquiry and mobile technology in the social studies classroom. The study employed a case study of two social studies teachers’ classrooms in a large suburban high school. Each social studies teacher opened two classrooms to observe, and focus group and interview participants were drawn from each classroom. Both teachers committed to integrating mobile technology and social studies inquiry into their classroom. A total of 109 students of South High School were observed in the classroom from December 2015 through May 2016.

A total of four classroom observations were completed, two from each teachers’ classes. There were 109 students present in both classrooms, 20 students participated in focus group discussions, and nine students were chosen from the focus groups to participate in personal interviews. A total of four focus groups were conducted and 12 personal interviews (some students were interviewed twice). All of the students in the focus groups were aged 14 to 17 years old, 11 were female and 8 were male. In this study, the following research questions were addressed:

1) How do high school students voice their experiences in a technology rich, inquiry driven, social studies classroom?

   a.) In what ways do students use mobile technology in social studies inquiry?
b.) How do high school students construct meaning from social studies inquiry using mobile technology?

The findings from this study will be organized according to each general theme uncovered in the data.

There are four general themes uncovered in the data for this study. The four themes that generated the findings for this study are that students engaged in inquiry using mobile technology (a) embraced the availability of resources and information when planning and conducting inquiries (b) reflected on communication with teachers and peers during the inquiry process (c) expressed that mobile technology provided opportunities to engage in learning and enhance knowledge outside of prescribed assignments (d) and used various creative outlets of mobile technology to communicate outcomes. Theme (a) and (d) are descriptive and address research question 1a. Themes (b) and (c) provide insight into research question 1b and how students construct meaning from inquiry and technology. The four themes were commonalities of student experience and voice across both history classrooms examined in this case study.

Students Embraced the Availability of Resources and Information When Planning and Conducting Inquiries

According to one student (Junior) “you can look up anything in the world”, and in all classrooms examined for this study, many of Junior’s classmates agreed. Students explained that the ease of acquiring information and accessing sources was beneficial to the inquiry process. Two of the key characteristics of the New Learning Ecology are access to information and self-directed learning (Spires et al., 2012). Student voice in this case study expressed significant support for mobile technology when accessing resources for inquiry. Of the 20 students that
participated in interviews and/or focus groups for this case study, most of them expressed the benefits of mobile technology when accessing resources and information for social studies inquiry. The ease of access to information was also a major topic of student voice in each of the focus groups conducted for this study. Students in each focus group repeatedly stated that access to information and the iPad made inquiry “easier”. One student stated in a personal interview, “the iPad makes research, taking notes, pictures, and recording projects so much easier. We can basically use it to gather all kinds of information” (Joe). During observations of both classes, students used resources on the internet to complete assignments and engage in inquiry.

In one observation of Mr. Jordan’s World History classroom, the students were exploring demographic data connected to the Atlantic Slave Trade and the origins and destination of African slaves brought to the New World. Students were asked to begin the lesson by exploring the internet for information on the Atlantic Slave Trade and the origins and destinations of African slaves. Students were first surveyed by the teacher to uncover preconceived notions of where most slaves originated from in Africa and where they disembarked in the New World. The teacher then discussed these preconceived notions, but did not discuss their accuracy. Following the discussion, students were directed to explore the resources of the internet and find sources that support or refute what the class discussed. Students were not directed to any specific website, but instead given search phrases that could be used to find relevant information. Most students were engaged in the process and were able to find reliable information on the origins and destinations of African Slaves. Following the exploration, Mr. Jordan directed students to data on embarkation and disembarkation of African slaves over a fifty-year period, the students were asked to chart this data on their mobile device and reflect on the information
they found. Classroom tasks like the one discussed above were typical of assignments in Mr. Jordan’s classroom, as students used the resources at their disposal to generate new knowledge.

Students in Mr. Dimah’s US History class were also observed taking time to access resources and build on knowledge before and during an assignment. Mr. Dimah would start every unit in his class by asking students to explore the central theme of the unit and generate questions they had before the start of the unit. Students were given central themes and used the internet to find information that they used to generate questions about the major topics in the unit. This exercise was discussed in both focus groups and personal interviews. One student stated that access to mobile technology allowed for her to “better understand the unit by having us learn about it ourselves” (Pete). Another student explained in a focus group that he was able to find some “background information” before the unit started and create questions that interest him (Ahmed). Of the five students interviewed from Mr. Dimah’s class all of them explained that they could not have accomplished this task effectively without access to mobile technology and the resources of the internet.

Students, when asked to respond to questions on how mobile technology was used for social studies inquiry in their class, overwhelmingly believed that it improved their ability to complete inquiry tasks because they could easily access information. When responding to a question on how the iPad was used to complete social studies inquiry in their classroom, students often highlighted the ease of access to information during inquiry and with mobile technology. Students provided statements such as, “just type in something and get a result in a matter of seconds” and “I can gather all the information I need for inquiry” when discussing the iPad’s benefit for accessing information (Pete; Lexi). Students from Mr. Dimah’s class stated that
“information was easy to find” and “easily accessible” (Dylan; Joe). Also, none of the students that participated in personal interviews or focus groups for this study questioned the benefit of the mobile technology in finding and compiling resources to complete inquiry. Students found this aspect of mobile technology to be the greatest benefit to social studies inquiry. One student from Mr. Jordan’s class explained it this way:

“The iPad has helped me in a positive way in this class as soon as I started to be responsible in how I found information and used it for learning. The iPad has helped my growth and grade in this class a lot. I look up information and find answers to things I don’t understand, and I also find information to complete assignments. I like the iPad a lot.” (Cindy)

While there was unanimous support for mobile technology when accessing resources, and using them to complete social studies inquiry, there was mixed responses in regard to how students viewed mobile technology and communication. Many students enjoyed the ease of communication that existed between peers and teachers, but others questioned if too much mobile technology undermined meaningful communication.

Students Reflected on Communication with Teachers and Peers During the Inquiry Process

One of the more interesting findings to come out of this study was student perception of the influence the iPad had on communication and relationship with peers, teachers and school work. While most students believed that mobile technology enhanced communication between peers and teacher, some believed it created a barrier to personal relationships and discussion in the social studies classroom. Katie, a student from Mr. Dimah’s class, stated that “the paradox of using the iPads in social studies class is we are isolating ourselves”, suggesting that we are closing the doors of communication. Katie was so passionate about this perceived barrier and
isolation that mobile technology created between student and teacher, that she dominated much of the early discussion in one focus group. Throughout the course of this study students reflected on the nature of communication when using mobile technology in the social studies, and the extent to which that communication benefited inquiry.

Many students that participated in this study reflected on communication and the benefits mobile technology provided when conducting inquiry in the social studies. Students stated that the iPad made group inquiry more efficient and “easier” as they could share information with group members in various formats (Junior, Lauren, Cindy). Also, students explained that conducting inquiry outside of the classroom was more effective as group members could use Google Chat and iMessage to share information. Students discussed that group inquiry would be more difficult without the iPad and reflected on experiences in middle school when they did not have iPad’s to work with groups. One student explained that “group interaction and communication is essential when working on a project, the iPad makes it easier…before the iPad you would not be able to really communicate without sharing numbers and stuff” (Jessica)

Communication with peers while conducting social studies inquiry in and out of class was enhanced through mobile technology according to many participants.

Student perception that communication with mobile technology aided group inquiry in the classroom was supported during classroom observations. Mr. Dimah’s US History classes were taught in South High School’s “21st Century Classroom” where students had access to group tables and display monitors that connect directly to their iPads. In one lesson, in which Mr. Dimah asked students to reflect on the positive and negative influences of the Industrial Revolution to 19th century American cities, students were able to display and share resources
between group members with ease. A dialogue between the five students highlight this benefit:

Student (1) “I found this picture of child labor, look”
Student (2) “perfect, send that to me and I will add it to our documents.”
Student (3) “I found one too, look at this one and how all the kids are dirty and sad”
Student (2) “Good, send that to me”
Student (2) “We need some written evidence too; did anyone find any?”
Student (4) “Yes, I just sent all of you guys something, I don’t know if it works or helps, but look at it.”
Student (2) “Put it up so we can all look at it.

The groups continued with this process until they compiled enough resources and information to complete the task they were assigned. The ease at which students were able to pass information and comment on information was evident throughout the lesson. Students engaged in the task, discussed their findings verbally, and exchanged evidence with mobile technology. The task was also completed at a pace that allowed Mr. Dimah to discuss findings as a class and assess learning through whole class discussion.

One of the most often discussed benefits mobile technology brought to the collaborative nature of inquiry was the ability of students to share information and progress with their teacher. Both Mr. Jordan and Mr. Dimah instituted blogging into their classroom as a form of journaling and reflection for their quarter long projects. Each teacher agreed to engage their classes in quarter long inquiries called “20Time”, because it constituted approximately 20% of their classroom time throughout the quarter. A component of 20Time was for students to report out and reflect on their progress each week through a blog. Students stated that blogging enhanced communication with their teacher, as they were able to easily describe their progress or findings at any time of day. One student stated in an interview that “blogging was cool and I could share my project updates with my teacher and classmates easily” (Dylan). Another student in a focus
group expressed that the blog was “good...because my teacher can write things on my blog or comment on what I am doing, so I can go back to it anytime I want to work on my project and fix things” (Chance). Students also shared that mobile technology made it easier for students to seek help outside of the classroom on assignments. Students stated that teachers were more accessible, and assistance on classwork and inquiry could be enlisted from their teacher on expanded hours. In a focus group discussion students were in agreement when one student stated that sending work to their teachers and getting feedback was much easier and helpful, although she added it “depends on the who the teacher is, if and when you get stuff back.” (Tess). Despite the stated benefits of mobile technology in communicating with peers and teachers, several students expressed concern that technology was providing “too much communication”, or creating a personal barrier between students and teachers.

When students were asked during one of the focus group discussions to reflect on the negatives one student stated that they did not like the iPad because it interfered with communication. The student explained that the iPad created a “barrier” between the teacher and the student as the technology has permitted many teachers to “sit at their desks and monitor students while they work quietly on their iPads” (Katie). This statement found many receptive ears in the focus group as several students also thought the iPad had increased their responsibility outside of school and one stated that “I do not have to talk to my teachers anymore, because I can just email them, or message them” (Lexi). When asked if this is something they have experienced in their social studies class, Katie stated, “sometimes...I mean Mr. Dimah is pretty good at discussing things with us at the end of an assignment, or before, but there are days in class where I want a whole discussion or explanation delivered by the teacher” (Katie).
Following Katie’s assertion that she wanted large group discussions and teacher centered learning at times, Tess responded and supported Katie by stating that “maybe teachers should have one day a week without technology”. While students tended to support the ease of communication delivered through the iPad, there was reason for concern that social interaction between the student and teacher could be influenced in a one-to-one classroom.

In a personal interview with Katie she offered that students are forced to submit assignments at all hours of the day and night, and there is no “separation between home and school”. While many see the ability of teachers reaching into the home and providing opportunities for students to complete assignments at their own pace as a benefit, this student took it as an intrusion.

“a major problem with the iPad is the Big Brother presence that high school kids deal with every day. There is no separation between home and school as teachers post assignments and comments during dinner time. The amount of stress is increased as online quizzes are due at 10PM…now teachers can sit behind their computer screen and students are expected to submit it all during a specific timeframe.”

- Katie

The attack that Katie levied on the iPad in this interview stemmed primarily from too much access with mobile technology. Teachers communicate “behind a computer screen” and students are not given the feedback they need, or the time they need to process. In the same interview Katie was asked if the iPad had any benefits when conducting social studies inquiry, she responded by stating that it did have many positives, but “I just think the negatives outweigh the positives” (Katie). The sentiment of mobile technology placing a barrier between teacher and student was also extended by two students in regard to peer interaction and communication. Tess explained in a focus group that the iPad was “replacing discussion and isolating
classmates.” Another student supported this by stating that “I feel like we are always on our iPad in Mr. Dimah’s class, so we do not talk to each other and discuss things as much” (Tony). While Katie was certainly the most outspoken critic of the negatives of mobile technology in regard to personal communication and learning, her sentiments were not without support from others in this study.

Many students expressed that mobile technology has eliminated the barrier between school and home, and while some researchers have presented this as a benefit, students may not see it the same way. Despite the discussion on the intrusive nature of mobile technology into the lives of students, there was a general acceptance that the iPad had the potential to engage students when doing inquiry and provided opportunities to extend their inquiry beyond prescribed assignments or knowledge. Even Katie who was so passionately against many aspects of mobile technology stated that “the iPad was an excellent tool for personal interests and personal inquiries, because I can learn and create in many ways” (Katie). Students from both classrooms were able to voice that their iPads provided opportunities to enhance knowledge within and outside of prescribed assignments.

Mobile Technology Provided Opportunities to Engage in Learning and Enhance Knowledge Outside of Prescribed Assignments

Students in both case studies often expressed that access to mobile technology allowed them to more effectively engage in their class inquiry, which occasionally led them to explore topics of interest outside of their prescribed lessons. One student (Mona) stated that she “can use the iPad to learn new material on my own, and expand my knowledge”, suggesting that mobile technology engaged the learners in this study. The enhanced engagement that students discussed
in focus groups and personal interviews was tied to an increased passion for learning through mobile technology. Student engagement and passion was observed in both case studies as students used mobile technology to explore topics, share findings, and enhance their learning experience when involved in social studies inquiry.

In an observation of Mr. Jordan’s class the students were asked to search the website YouTube for clips that demonstrated what the students understood as characteristics of trench warfare. The directions of the assignment were to identify clips from motion pictures that exist on the internet and use them to address the guiding questions of How has the media or motion pictures presented trench warfare from World War I? What are the common elements and themes present in the 6 movie clips that your group found? Students were not given strict guidelines on length, but discouraged from analyzing anything longer than five minutes. They were also encouraged to get consensus from all the group members that the clip met their collective understanding of what trench warfare was. Groups ranged from four to six students and they were instructed to find six clips to analyze. The directions for the assignment took ten minutes of the 50-minute period and the students were grouped together and sent to find their clips.

The six groups were engaged in the task throughout the lesson and were discussing the characteristics of trench warfare and how it was represented in the media for the remaining 40 minutes of the class time. One group sat down to watch each clip that was found together and then discussed the characteristics they found. Another group sent the links of each clip to their group members and then discussed their findings once everyone had watched the scenes. A third group had each group member watch a clip and then shared with each other what they found and
then they compiled a collective list of characteristics and ideas. Students throughout were engaged in the different clips, discussing actions and aspects of all of them, and creating detailed reports of their findings. Students were heard interacting with their peers with passionate expressions of “cool”, “did you see that”, “look how dark everything is”, and “I didn’t know there were so many movies about World War I”. Students were also observed watching and discussing clips they found with each other and pointing out characteristics in the clips that were relevant to the lesson. The lesson was to conclude the next day when students presented their favorite clip to the class and discussed its connection to World War I themes and events. There was considerable engagement with this activity and students embraced the lesson with enthusiasm as they worked through the movie clips.

A group of students in Mr. Dimah’s class decided to take their love for cars and integrate it into their US History 20Time project. Students researched and composed blogs on early automobiles in class and discussed ways in which they could build a model of an early automobile. The use of blogging provided an efficient way for the students to update their progress with mobile technology. In their blog, the students discussed early automobile designs and the ways in which early companies utilized the assembly line for production. After completing their research, the students set out to create a simple model of an early car in their garage. The students focused on the mechanics of steering in an automobile, because it did not require a combustion engine, and worked over several weekends to build a model (Appendix E). Dylan in his interview stated that he really enjoyed the project, because “he likes to work with his hands” and he also expressed that he appreciated “the way that people in the past struggled to construct something new without much to go on.” The commitment to work over several
weekends outside of the class to complete the project is evidence of engagement and passion for their inquiry project. Dylan and his group created a time lapse video of their progress on the model and included comparisons with early automobiles in their production. According to Dylan, without the iPad he would not be able to “show their final model to the class” and probably would not have bothered to build the actual model. The ease in which the students could update their teacher on the progress they were making and the ability to provide evidence to their classmates allowed the students to extend their learning further and create a working model. The use of video was an often-cited tool that students enjoyed when working on inquiry.

In Mr. Dimah’s eleventh grade US History class, the production of videos was a common tool to generate student interest and learning. In one lesson observed for this study Mr. Dimah’s students were asked to create a short documentary outlining a characteristic of totalitarian regimes in the 1930s. Mr. Dimah presented the common characteristics of totalitarian regimes (state control of individuals, methods of enforcement, modern technology, state control of society, and the cult of personality) in the 1930s and discussed the relevant terms. Students were then tasked with creating a three to five-minute documentary on one of these themes. Students were to write the original script, record the video with their devices, and present their finished product to their classmates. During the creation of their videos students were observed discussing terms like indoctrination, propaganda, persecution, censorship, absolute authority, liberty, and mass communication. Students were engaged throughout the observed portion of the lesson and seemed to be enjoying many elements of the activity.

During the activity on totalitarianism, students were encouraged to elevate their vocabulary in the film and discuss topics they would not normally discuss, extending their
Students responded with thoughtful overviews of their prescribed characteristic. The activity generated discussion on topics and vocabulary they were previously unfamiliar with, and helped them discuss ways in which early twentieth century governments controlled and manipulated their populations. Producing short films in Mr. Dimah’s class was common, but the lesson outlined above became a topic of conversation with one student in a personal interview. In his interview, Joe, a 17-year-old male in Mr. Dimah’s class explained how he extended his learning even further outside of the classroom. Joe explained that he liked “being able to produce video and iMovie to present to the class, because I really enjoy making films.” When Joe made the statement, he was asked to elaborate on the assignment and project on totalitarian regimes. Joe stated that “he really liked” the assignment and actually became very interested in ways that governments or groups indoctrinate people. According to Joe, he watched several documentaries on Nazi Germany and Stalin and thought about ways that groups or governments indoctrinate people today.

Joe’s use of the iPad to learn new material or enhance his learning was something many students discussed during focus groups or personal interviews. During a personal interview a student in Mr. Jordan’s class stated that “I like the iPad for enhancing my knowledge about a topic, for example I was able to go learn about historical views on the Renaissance” (Lauren). Another student responded with “I use the iPad to learn new material on my own and expand my knowledge” (Edie), while another added “yeah, the iPad provides information that we normally would not know or have access to” (Cora). Over the course of six focus group discussions connected to this study students positively stated that the iPad increased enjoyment and passion for tasks in their social studies class 25 times, and in a majority of cases the statements were
reaffirmed verbally or with nods by many of their peers. As many students agreed that mobile technology helped them engage in and enjoy learning tasks in a one-to-one classroom, there was clear evidence also that mobile technology allowed students to communicate outcomes in varied and creative ways.

Students Used Various Creative Outlets of Mobile Technology to Communicate Outcomes

Students in this study often discussed the power of mobile technology to engage them in their learning tasks, and they leveraged the tools of the iPad to generate creative outcomes. In focus groups and interviews with students, there were many statements that highlighted the tools of mobile technology when creating and sharing outcomes with peers and teachers. One student stated that “the iPad allows us to creatively elaborate and share topics that are new to us” (Lexi). Another student added that “it is really cool to see the things you can create at the end of projects with the iPad” (Cindy). The idea that mobile technology allowed for more creativity in their learning was prevalent in the focus group discussions, but it was also the focus of two students in their personal interviews.

Jeremy, a 9th grade boy in Mr. Jordan’s class was a student who found immediate and constant access to technology a major benefit to the outcome of his 20Time project. Jeremy stated that without the iPad and technology he would not have enjoyed 20Time (Jeremy). When asked to elaborate on what he meant by this, Jeremy stated:

I really like technology and the things I can do with it. For my 20Time project I was able to create my own civilization and then I created my own webpage and links to the different parts of my civilization. Also, it was really easy for me to present the webpage to the class and I was able to ask kids to go to my webpage and vote on if they would want to live in “Jeremany”. It was a fun project. (Jeremy)
Jeremy’s webpage was completed with a description of the origins of his state, where it would be located on the Earth, its values, and descriptions of its political, economic, and social systems (Appendix F). Each part of Jeremy’s webpage was linked to his home page and while presenting Jeremy was able to click on the links to bring his audience to a different component of the nation of “Jeremany”. Jeremy was asked during the interview if he could have created this project without the iPad or the technology and he did agree that he could. Jeremy however, stated that “the iPad and the web design made it more interesting”. When he was asked to explain how it made the project more interesting, Jeremy explained that he was able to get the students in the class involved directly in the presentation and go to the website and explore while he was presenting. Jeremy also, stated that “the internet and web are where we go for information, and the students were able to better understand what I was telling them”. Whether Jeremy’s audience was able to better comprehend the ideas and particulars of “Jeremany” is a question this study cannot answer, but Jeremy was convinced that without the iPad and the internet his project would not be as “interesting.” According to Jeremy “it is a really cool when we can come up with modern ways to explore old things.”

Jeremy was not the only student that spent much of their interview discussing how the iPad and mobile technology were beneficial to presentations. Adam, a 10th grade boy in Mr. Jordan’s class also believed that the iPad made his presentation more interesting. Adam stated that he made a board game on 18th century Europe and the game was a strategy game of conquest. Adam explained that the game was “like Risk but on a smaller scale, because I only made a map of Europe (Appendix G). I then divided the different countries of Europe into smaller squares, so it worked pretty well” (Adam). When asked to elaborate on his project,
because a board game does not sound like it is dependent on technology, Adam explained:

No, it wasn't really connected to technology. But, I had to present it in 5 minutes and I didn’t know how I was going to do that. So, I filmed different parts of the game and made Google slides of the different rules. I had my friends play the game and I filmed them, then I cut the video to show the parts that connected to the rules. So, my presentation was 5 minutes long. It worked pretty well I think, because I could put music in and it was easier to watch than me playing the game in front of the class, or explaining it. (Adam)

Adam was able to use his iPad to create a video overview of a board game and stay within the required 5 minutes of presentation time. He also stated the he did all of his research on the iPad and was able to “learn a lot” about 18th century Europe from this project (Adam). Jeremy and Adam were both convinced that mobile technology allowed them to create better presentations and that without the technological tools at their disposal they would not be able to generate the outcome they presented.

In all four focus group discussions students were asked to comment on the benefits of the iPad and mobile technology and they were drawn into a discussion on the iPads benefits when generating outcomes to assignments and inquiries. When discussing the completion of their assignments students would comment that the iPad and mobile technology gave them the opportunity to use “creative” and “new” ways to complete and present their assignments. One student stated that “without the iPads our projects would not be as creative and we would not be able to present are findings in tech savvy and cool ways” (Mona). Many students agreed and nodded to this statement approvingly as someone added that “the iPad helps me adapt information and projects to the new social life in this generation of technology” (Pete). When the focus group was asked to elaborate and add to the comments of these students, students offered that the power of film as a presentation was a great way to present information. Also,
many students mentioned that they enjoyed importing music and images to their presentations and projects, as well as the ability to include audio to supplement text and their own voices. Students also stated that they enjoyed the discussion board component of their online classroom site and the ability to comment on questions and day to day assignments in their online classroom site. In Mr. Dimah’s class students were often asked to write a discussion board posts on the day’s activities. This post was a statement of what they learned or response to a topic of the day. One of Mr. Dimah’s students stated that they enjoyed this task, because “it helped them remember and summarize the stuff that was learned that day” (Dylan). As students discussed the benefits of technology to communicate their conclusions and outcomes, it was the power of film and video that seemed to appeal to many students in the study.

Students highlighted the ease in which they could interact with and generate video using mobile technology in focus groups and personal interviews. Students used video in their presentations, projects, and blogs. As students participated in focus groups and discussed the benefits of the iPad when constructing outcomes, the use of video to present findings or generate new ideas was one of the most often discussed outcomes. Students expressed that using using video and filming for learning in Social Studies, and made projects and learning “fun” (Joe). Filming seemed to generate enough motivation that Mr. Dimah would also require students to create and share short films or videos in his class. It is evident in this case study that students believed filming and video creation engaged them in their social studies class. Of the 20 students that participated in focus groups and personal interviews 15 stated they used filming in their presentations, eight used online film clips, and ten reported using other forms of online media. Even when students chose to engage in a more traditional project for 20Time they often
would employ film and video into their projects.

Gale was a 9th grade student in Mr. Jordan’s class and she stated that she enjoys writing and telling stories. For her 20Time project she wanted to address how people lived in 18th century America and write a first-person journal of a girl of the time. Gale did the research on her iPad and organized her notes, so she could recreate a journal of a teenage girl during the American War for Independence. When it was time for Gale to decide on how to present her journal she felt that she could not stand in front of the class and read her writing. Gale’s solution was to record herself with music as she read two entries of the journal. She also created a short film explaining her process as she created the journal (Appendix H). Gale displayed where she found the background knowledge to write her content, how she decided on the main subject of her journal, and how she went about constructing the journal. Gale was able to provide recordings of some of the text as well as time lapsed video when aging and binding the journal. Gale explained in her interview that she enjoyed making the film and she also provided students with the rest of her journal by posting images in the online classroom. Gale’s project was an example of how a student utilized mobile technology and film to easily share a bound and written outcome. Over the course of this case study, students found video and films to be a valuable tool when sharing their findings. Like Gale, students used video often to share and communicate the outcome of their inquiry with classmates and teachers.

Conclusion

The students’ voices in this dissertation highlighted a unique experience of student interaction with mobile one-to-one technology and social studies inquiry. In this case study
students interacted with peers and teachers using mobile technology, conducted inquiries with mobile technology, and shared findings from their inquires using mobile technology. Given voice through this study students expressed that the access to and availability of resources with mobile technology is beneficial to the inquiry process. Students enjoyed the ease of access to the internet and the ability to find and store resources for their inquiry when using mobile technology for classroom assignments. Students also engaged in discussions and reflection on communication during the inquiry process. Many students stated that communication with peers and teachers was aided by the use of mobile technology, but some found that meaningful communication, especially between teacher and student was hampered. As students reflected on the nature of communication and whether it was enhanced or interfered with, they also shared the benefits of technology in enhancing their inquiry learning and outcomes. Students stated that they could use the tools and resources in mobile technology to explore new topics and build on prescribed assignments. Students also shared that they could use mobile technology to enhance their learning outcomes and share their learning in “new ways.” This case study is a window into student experiences with mobile technology in inquiry-driven social studies classrooms.
CHAPTER 5
DISCUSSION AND CONCLUSION

Students in American high schools are faced with new standards that require them to use inquiry and technology to demonstrate learning. The National Council for the Social Studies (NCSS) developed the *C3 Framework for Social Studies* in order to engage students in inquiry learning in each of the disciplines of the Social Studies. According to NCSS (2013) there are significant connections between the C3 Framework and the *ELA/Literacy Common Core Standards*. The push by the NCSS and the Common Core Standards to have more inquiry learning in social studies mirrors the five decades of research on inquiry learning in the social studies. Alongside a recent desire to include more inquiry into social studies classrooms is the increasing presence of mobile technology.

Many schools are introducing mobile technology into their classrooms, providing students with a one-to-one student to device ratio. As students are given access to technology during the school day and beyond, the traditional barriers to technology use in schools are undermined. Many researchers have suggested that mobile technology can facilitate a pedagogical shift toward inquiry learning in the classroom (Berson & Berson, 2007; Bull, Hammond, & Ferster, 2008; Hofer & Swan, 2014; Friedman & Heafner, 2007; Friedman & Heafner, 2008; Lee, 2002; Lee & Molebash, 2004; Saye & Brush, 2002; Tally & Goldenberg, 2005; Waters, Kenna, & Bruce, 2016). While many researchers have studied the influence of inquiry and technology on student achievement, few have explored student experience with
inquiry and technology. Listening to student voice in the midst of curriculum change is essential to understanding how to better facilitate a student’s education in the classroom (Lee & Spires, 2009). The purpose of this study was to examine the voice and experiences of high school students, and how high school students construct meaning through inquiry and mobile technology in the social studies classroom.

Overview of Study

This study examined student voice in social studies classrooms that utilized both social studies inquiry and the use of mobile technology. Since a detailed description of student experiences with social studies inquiry and mobile technology use is the goal of the research, a qualitative design was used. The research questions for this study were:

1) How do high schools students voice their experiences in a technology rich, inquiry driven social studies classroom?
   a.) In what ways do students use mobile technology in social studies inquiry?
   b.) How do high school students construct meaning from social studies inquiry using mobile technology?

A descriptive case study of two classrooms in a large suburban high school was used. At the time of the study the high school was one of five high schools in the district with an enrollment of 2,295 students. 32% of the students in South High School were designated as low income, and 52.3% were Caucasian, 21.2% were Hispanic, 15.3% were Asian, and 6.5% were African American (IRC, 2015-2016). South High School was in the second year of a one-to-one mobile device (iPad) technology initiative at the time of the study. All students were issued an
iPad and expected to use the device at school and at home to complete assignments.

The participants for this study were drawn from four history classes (two 11th grade US History classes, and two 9-10th grade World History classes) in the social studies department of South High School. The first teacher, Mr. Dimah (for reasons of confidentiality, both instructors chose their own pseudonym for this research study) has taught at South High School for 11 years and was one of the original pilot members of the mobile technology initiative in the district. The second instructor, Mr. Jordan, was employed in the district for 15 years and adopted the use of the mobile devices in the classroom at the behest of the district in the final roll out of the program.

Limitations

The following are limitations of this case study. First, as this case study depended on a site for convenience, there was some lack of diversity in the participants. For example, a majority of the students were suburban and predominately middle class. Second, the sampling technique used in this study was limited to convenience and purposeful sampling. Convenience and purposeful sampling was conducted out of ease and accessibility rather than an attempt to generate a random sample. Students volunteered to participate in interviews and focus groups for this research, and as a result not all student voices were heard. Also, the dependency on convenience sampling created a slightly higher number of female participation in the focus groups and interviews for this study, and again a full representation of student experience might not have been analyzed. Finally, the issue of reactivity to the researcher is a concern in this study. The researcher is a teacher in the school and the students, although not directly instructed by the researcher, are familiar with the researcher’s role in the school. Maxwell (2005) defines
reactivity as “the influence the researcher has on the setting and individuals in the study” (p. 108). Students may be influenced by the authority role of the researcher, and their statements and behavior might be a reaction to this role, rather than honest reflection. Students could provide answers and conduct themselves in ways that mirrors the expected behaviors and responses governed by the school setting. While student co-researchers may have alleviated some of these tendencies, it cannot be assumed that the researcher’s position of authority did not create some bias. The limitations of this study outlined above influence the findings and inform possibilities for future research on social studies inquiry and technology.

Summary of Findings

Throughout this study participants were given the opportunity to voice their experience in an inquiry driven and technology rich classroom. Students were able to share their experiences in focus group discussions and in personal experiences. Students were also able to share their work and allowed their activities to be observed by the researcher. As data was collected, transcribed, coded, and analyzed the ways in which students used mobile technology in social studies inquiry became clearer. Also, there was significant insight into how students construct meaning from social studies inquiry using mobile technology. The research questions for this study were answered with four major findings; students embraced the availability of resources and information when conducting inquiries, students voiced their experiences on communication with peers and teachers, students were able to use mobile technology to engage in learning and enhance their knowledge outside of the classroom, and students were able to use mobile technology to generate creative outlets when communicating outcomes.
The first major finding present in the data was that students embraced the availability of resources and information when planning and conducting inquiries. Students often stated and shared that they enjoyed the way in which mobile technology provided resources to conduct inquiries with ease. The second finding was students voiced their experiences on communication between peers and teachers when conducting inquiries with mobile technology. In most cases students expressed and shared the benefits of mobile technology when communicating with peers and teachers, but some students stated that technology was a barrier to communication and relationships with peers and teachers. The third finding was that students were able to use mobile technology to engage in learning and enhance their knowledge outside of the classroom. Students were able to not only engage in inquiry in school and under the direction of the teacher, but they were able to expand their knowledge and in many ways generate new knowledge when no teacher or classroom was present. The fourth finding present in the data, suggests that students were able to use mobile technology to generate various creative outlets to communicate outcomes. Students often highlighted the tools of mobile technology which allowed them to creatively share outcomes with teachers and peers. Each finding generated from this study connects to past research on social studies inquiry and technology, and to the conceptual framework of the study.

**Students Embraced the Availability of Resources and Information During Inquiry**

The first finding present in the data was that students embraced the ease in which resources of the internet and mobile technology could be employed to conduct social studies inquiry. One of the key components of social studies inquiry is acquiring data or evidence to
address a hypothesis (Banks & McGee-Banks, 1999; Beyer, 1979; Massialas & Cox, 1966). According to Massialas & Cox (1966) this was the “exploration” and “evidencing” stage of the inquiry process while Banks & McGee-Banks (1999) used the terms “collection of data” and “evaluation and analysis of data.” Researchers in historical inquiry also highlight the analysis of sources, both primary and secondary, when conducting inquiries (Damico & Baildon, 2011; De La Paz, 2005; Monte-Sano, 2011; Mont-Sano & De La Paz, 2012; Reisman, 2012, 2015; VanSledright & Kelly, 1996; Wineburg, 2015; Wineburg & Martin, 2004). In this case study students interacted and analyzed various types of text on their mobile device, to generate knowledge and complete assignments. In much of the early research on technology in the social studies classroom, access to resources was a key benefit (Bolick, C.M., 2006; Bull, G., Hammond & Ferster, 2008; Friedman, 2014; Lee, 2002; Lee & Molebash, 2004; Martin, & Wineburg, 2008; Tally & Goldberg, 2005). However, according to Staudt (2005), computers in labs actually were a barrier to student learning, isolating students from where learning occurred. Students in both case studies repeatedly discussed and highlighted the benefits of mobile technology when accessing resources, and it was the most often discussed benefit of iPad use in and out of the classroom. Researchers have also suggested that the personal use of technology would provide increased access to historical sources and information, this increased access would be multimedia supported and students would interact with multimedia text (Brush & Saye, 2008; Greenhow, Robelia, & Hughes, 2009; Martin & Wineburg, 2008; Saye & Brush, 1999, 2002). Students in this case study were observed interacting and discussing different types of text, often jumping back and forth between pictures, written text, and videos. The first finding that emerged from this case study supports much of the research done on social studies
inquiry and technology.

The first finding also correlates with the conceptual framework for this study. Student “immediate and constant access to technology” is a key component of the New Learning Ecology (Spires et al., 2012). Students supported the ease at which they were able to access and use resources, not only in the classroom but outside of the classroom. This suggests that student voice in this study gives support to the premise that one-to-one mobile technology can influence the way “school, community, pedagogy, and learning interact” (Spires et al., 2012). All the students interviewed in Mr. Dimah’s class stated that they could not complete the pre-unit exploration of central themes, without the internet. Students stated that the internet provided them with the quick access to resources and information they needed to complete the assignment. These students felt that the assignment would have taken days to complete, or would have been completed only from what they could find in the textbook, if they did not have the resources of the internet to assist them. For many students in this case study the ease and access to information aided their learning when they had access to a variety of text and information.

Student support of the ease and constant access of resources also supports and informs dimensions two and three of the C3 Inquiry Arc (NCSS, 2013). As students interacted with resources, or discussed resources, they often applied disciplinary skills to complete assignments. Applying disciplinary skills to learning is the key component of dimension two in the C3 Inquiry Arc (NCSS, 2013) A prime example of this is the lesson on the African Slave Trade in Mr. Jordan’s class. Here students were directed to historical data on the ordination and destination of African Slaves, and asked to reflect on the historical information they found in a written paragraph. Students in this task used historical literacy skills and reflection, as well as
geographic knowledge and skills. Dimension three of the *C3 Inquiry Arc* asks that students evaluate sources and use evidence to complete social studies tasks. In both case studies students were observed or discussed using evidence in personal interviews and focus groups. While most of the discussion centered around the student’s support of access because of technology, the observation of Mr. Dimah’s class when students analyzed and discussed images in the Industrial Revolution, highlights the ease at which students could access, exchange, and evaluate historical evidence. While the first finding generated from the data, strongly supports both the research and the conceptual framework for this study, this is not true of all of the evidence in the second finding.

**Students Reflected on Communication with Teachers and Peers**

The second finding present in the study was that students often reflected on communication with teachers and peers during the inquiry process. The process of social studies inquiry can be enhanced when done in a collaborative setting, as students work together to generate conclusions and complete tasks. In both case studies students were observed or shared that collaboration with their peers and teacher was “easier” with mobile technology. Engle and Ochoa (1988) put peer discussion and collaboration as a key component of issues based inquiry. Many other researchers have supported and adapted Engle and Ochoa’s discussion framework when conducting issues-based learning in social studies classrooms (Meyerson & Secules, 2001; Peters, 1994; Rothe, 1993; VanHover & Van Horne, 2005). Students in this case study also tended to look on blogging as a powerful way to practice writing and communicate with their teachers. Many researchers have suggested that blogging encourages students to practice literacy
skills and communicate outcomes (Frye, Trathen, Koppenhaver, 2010; Harris & Hofer, 2011, Heafner & Friedman, 2008; Holcomb & Beal, 2010, Mayers, 2008; Zheng, Niiya, & Warschauer, 2015). Student support of collaboration with mobile technology often surrounded the ease at which they could share information, and discuss conclusions with both their peers and teachers. According to Zurita and Nussbaum (2004), there are many barriers to face to face discussion and collaboration, but mobile technology can eliminate many of these barriers (Inkpen, 1999; Lundin & Magnusson, 2003; Zurita & Nusbaum, 2004). As students tended to support the ease and benefits of collaborative communication with mobile technology, some students viewed mobile technology as a barrier to communication.

Student support of the benefits mobile technology gives collaboration and communication, does suggest that teachers in one-to-one classrooms may be more effective facilitators of learning, rather than the center of learning. Teachers as “facilitators” of learning is one of the key components of the New Learning Ecology and one-to-one technology access (Spires et al., 2012). Students were observed sharing and discussing their learning with the iPad, and many liked the opportunity to share their learning with instructors through blogs, or online communication. Students also stated that they enjoyed their 20Time projects which encouraged them to be “curious learners” and “self-regulated” when doing inquiry. Both “curious learners” and “self-regulated” learners are supported by the New Learning Ecology (Spires et al., 2012). However, not all the students viewed the iPad as a powerful communication tool, or a powerful tool for collaboration.

Some students viewed mobile technology as a barrier to communication and did not support that teachers were being “facilitators” of learning, but rather detached from the learning.
One student even longed for face-to-face discussions, stating that mobile technology “weakens the relationship between student and teacher, as everything is done through a screen (Katie). Katie’s concerns, which were affirmed by some students in a focus group, would suggest that the “teacher as facilitator” is not always beneficial and would prefer to have their teacher occasionally lead in learning. The idea of students as “self-regulated” learners was also brought into question as students voiced their concern that they do not always wish to be “self-regulated.” Mr. Dimah’s student Dylan stated that “…if I am always learning by myself and without the whole class, how do I gain other perspectives.” As mobile technology supports the idea of the New Learning Ecology, many students may not view the transformation as beneficial and long for more traditional learning and discussion.

Students also suggest that the change in the way teachers communicated with students with mobile technology is intrusive and burdensome on their personal lives. When reflecting on communication with mobile technology many students voiced that “constant access” to information has negatively influenced how teachers communicate with students. Students reflected that they were not supportive of having assignments and other school related activities and tasks constantly interfere with their activities out of school. Also, students resented that teachers could assign tasks at any time, or as Katie stated, “sit behind their computer screen” and assign tasks. While Spires’ (2005) New Learning Ecology suggests that a “constant access to information” and “self-directed learning” benefits student learning experiences, students might not embrace the changes that accompany mobile technology. Some students viewed “self-directed learning” and “constant access to information” as a barrier to peer and teacher relationships.
Technology Allowed Students to More Effectively Engage in Learning, and Occasionally Extend Learning

The third finding generated from these case studies suggests that students were able to more effectively engage in their inquiries, and occasionally extend learning outside of the classroom with mobile technology. One of the key components of social studies inquiry is that learners become curious and self-directed. In the primary models of social studies inquiry these characteristics of the learner are defined as “doubt and concern from the learner” or “orientation to a problem” (Banks & McGee-Banks, 1999; Massialas & Cox, 1966). Other models of inquiry also suggest that student interest and curiosity is important when engaged in social studies inquiry. Researchers in historical inquiry suggest that student’s emotional connection to evidence or the task is essential to historical understanding (Beck & Eno, 2012; Tally & Goldenberg, 2005; Grim, Pace, & Shopknow, 2004, Resiman, 2015). Students voiced that mobile technology enhanced their learning and extended it beyond the classroom, occasionally outside of prescribed assignments or direction. Student extension of their knowledge outside of the classroom suggests that they had become curious learners or possessed social-emotional engagement in the process of inquiry. Student engagement of social studies material might be more effective with mobile technology, and many students were able to use mobile technology to extend their learning. As one student stated: “the iPad makes self-driven projects a lot of fun” (Edie). The use of mobile technology to complete inquiries outside of the classroom supports the contention by some researchers that smaller and less-disruptive devices can become a lifelong-learning tool anywhere, anytime (Inkpen, 2001; Sharples, 2000; Staudt, 2005; Traxler, 2009).

Student voice regarding extending their learning outside of the classroom was most
prominent when students discussed their 20Time projects. Students stated that they enjoyed completing their projects outside of school and worked on them on their own time. 20Time projects were inquiries that students planned and developed with their teacher and supports the first dimension of the C3 Framework (NCSS, 2013). The “curious learner” and “personalization of learning” components of the New Learning Ecology are also supported by student statements regarding 20Time. Students explained that personal choices made 20Time appealing. Dylan stated in his personal interview that “20Time and the iPad helps me engage in a topic I am interested in, it also helps me focus on the research.” While 20Time was referenced the most when students discussed extension of their learning outside of the classroom, it was not the only way that students extended their learning. Joe’s explanation in his personal interview that he extended his knowledge on totalitarian regimes at home because he became more interested in the subject is evidence that carefully planned inquiries can lead to curiosity and more personal learning experiences. This was supported by Edie’s statement that she uses the iPad to expand her knowledge and learn on her own. The ease at which students used mobile technology outside of school and the ability for students to collaborate with their peers often extend to their ability to create unique and personal outcomes for their learning. The fourth finding uncovered from the data in these case studies highlights the extent to which students could generate unique and personalized outcomes.

**Students Used Mobile Technology to Generate Various Creative Outlets to Communicate Outcomes**

Students in this case study shared or discussed unique, creative, and personalized outcomes for inquiry in their classrooms. According to many researchers in social studies
inquiry technology will open the door to alternative ways to practice and share historical literacy skills (Beck & Eno, 2012; Bull, Hammond, & Ferster, 2008; Hofer & Swan, 2014; Manfra & Lee, 2012). Students in both classes engaged in discussion posts and blogging tools to share and reflect on their assignments. Students not only created blogs and engaged in online discussion of historical topics, but also highlighted the benefits of mobile technology when constructing and presenting knowledge. Many researchers have suggested that technology will benefit the construction and presentation of social studies knowledge (Beck & Eno, 2012; Berson & Berson, 2007; Boon, Fore, & Spencer, 2007; Harris & Hofer, 2011; Ilhan & Oruc, 2016; Mayers, 2008; Holcomb & Beal; 2010; Waters, Kenna, & Bruce, 2016). Many of the students in this case study enjoyed the video feature in their mobile devices for sharing and presenting knowledge they generated. This was highlighted in Gale’s project, which was a more “traditional” attempt to engage in history through first person journal writing. Gale was able to share her outcomes and process with the whole class, through the use of video. This was something that Gale found very useful and offered a different approach than simply reading her journal in front of the class. As researchers in both technology in education and social studies education have suggested, technology can positively influence how students generate and share knowledge (Beck & Eno, 2012; Boon, Fore, & Spencer, 2007; Crawford, Hicks, & Doherty, 2009; Harris & Hofer, 2011; Holcomb & Beal; 2010; Mayers, 2008; Sherman & Hicks, 2000; Wilson & Wright, 2010). This was highlighted by participant voices and experience throughout the research conducted for this study.

The data in this study also supports components of the New Learning Ecology. Many students voiced that their learning was more relevant when they were able to use technology to
generate outcomes. Relevancy of learning is evident in Jeremy’s statement that “it is a really cool thing when we can come up with modern ways to explore old things.” Pete supported Jeremy when he stated that “the iPad helps me adapt information and projects to the new social life in this generation of technology.” The outcomes generated by many students also supports the New Learning Ecology’s components of personalization of learning and creative learners. Many students stated that they were able to use mobile technology to personalize their outcomes when completing inquiries. Jeremy used web design to complete a webpage, something he was very interested in. Many students found that video features present in mobile technology allowed them to generate more personalized presentations and outcomes. Students also supported that technology often made them more creative with their projects and assignments. Gale found a creative way to fuse her journal with technology in her presentation and Jeremy was able to use technology and his website design to engage his audience during his presentation. Students in this case study implemented personalized and creative outcomes to discuss and share their learning.

The fourth finding from this case study that students used various creative outlets to generate outcomes also supports dimension three and four of the C3 Inquiry Arc. Dimension three of the C3 Inquiry Arc asks that students use evidence to create claims or defend arguments. Students in this case study were observed using evidence to draw conclusions. This was observed in Mr. Dimah’s class as students discussed how visuals of 19th century America informed them on the realities of urban life, and was presented in 20Time projects when students shared their learning on fashion in 1920s America. Student outcomes in this case study also supported dimension four of the C3 Inquiry Arc. Dimension four of the C3 Inquiry Arc asks that
students engage in “opportunities to represent their ideas in a variety of forms and communicate their conclusions to a range of audiences.” Students in this case study shared their learning and discussed their learning through a variety of tools provided by the iPad, and often did so through creative and personalized approaches.

All four findings in this case study are tied to both past research and the conceptual framework for this study. Table 5 highlights where the findings address the conceptual framework for this case study (see Table 6).

Table 6

The Integration of the New Learning Ecology and the Dimensions of the C3 Framework with High School Social Studies One-to-One Environments

<table>
<thead>
<tr>
<th>Characteristics of the New Learning Ecology</th>
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<tbody>
<tr>
<td>Teacher as content expert and facilitator</td>
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<td>Self-directed learning</td>
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<td>Curious learners</td>
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<tr>
<th>Dimension 1: Developing Questions and Planning Inquiries</th>
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<td>Second finding questions whether students prefer self-directed learning and enjoy planning inquiries.</td>
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<th>Dimension 2: Applying Disciplinary Tools and Concepts</th>
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<td>First finding supports that mobile technology aids the “immediate and constant access to information”.</td>
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<th>Dimension 3: Evaluating Sources and Using Evidence</th>
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<td>First finding supports that mobile technology aids the “immediate and constant access to information”.</td>
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<tr>
<th>Dimension 4: Communicating Conclusions and Taking Informed Action</th>
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<tbody>
<tr>
<td>First finding supports that mobile technology aids the “immediate and constant access to information.”</td>
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The New Learning Ecology and C3 Inquiry Arc Dimensions in the Findings

- Second finding suggests that students prefer self-directed learning and enjoy planning inquiries.

(Continued on following page)
Table 6 (continued)

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<td>- Fourth finding suggests that students may find more relevance in disciplinary tools and concepts when using mobile technology in inquiry.</td>
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Table 5 integrates the characteristics of The New Learning Ecology and the C3 Framework from table 3 with the findings from this case study. Each finding in this case study aligns in a column with both inquiry and technology, and often different facets of the finding are situated in a column more than once. For example, the first column self-directed learning and the planning of inquiries are not supported in all the findings as participants stated that they occasionally preferred the teacher to act as the center of learning. Finding three however, suggests students engaged with technology and inquiry often exhibit the characteristics of curious learners when permitted to be self-directed in the inquiry process.

**Recommendations for Future Research and Practice**

The case examined for this research both adds to past research on social studies
inquiry and the use of technology in the social studies classroom. This case study also adds to the body of research on student voice and the importance of student voice when examining changes in curriculum and technology use. The conclusions of this study, not only support and add to past research, but also suggest opportunities for future research and future practice.

Future Research

There are several ways that this case study informs future research on social studies inquiry and mobile technology. First, more research needs to be done on student voice on inquiry and mobile technology use in the classroom. While many studies in the past have focused on the benefits of inquiry and mobile technology, few have examined student voice in regard to these curriculum initiatives. Students are too often ignored in the face of curriculum change, and changes to the structure and function of the classroom. Ignoring student voice neglects the powerful insight students provide on ways in which inquiry and technology can affect their learning. Also, future studies need to be done across the social studies curriculum in regard to inquiry and technology. This study was confined to two history classrooms, but future research across the disciplines is needed to fully understand student experience with inquiry and technology.

Second, while this case study attempted to capture student experience and voice, it utilized focus groups, observations, student work, and personal interviews over the course of one semester. A study that interviews and follows individual students at different points during an entire school year, might generate rich qualitative data as well as alleviate some of the demographic limitations of the participants. Also, a longer study that isolates student experience
with technology and student experience with inquiry before following up with similar research to
this study, may alleviate some of the limitations connected to convenience sampling. Data from
the future research suggested above would be useful in capturing the lived experience of students
engaged in inquiry and technology over a longer period of time, and provide further insight into
the findings in this case study.

Third, as student voice is important to understanding changes to curriculum and the
school environment, so are teacher and administrator’s voices. Teachers and administrators
interact with students daily and help shape the classroom and school environment. Their voices
are important to understanding the influence of mobile technology on inquiry, the classroom, and
the school. There needs to be more research investigating how teacher and administrator
perspectives are influenced by mobile technology, and the ways in which teachers utilize inquiry
with mobile technology. As with student voice, teacher and administrator voice provides
powerful insight into the influence of mobile technology on the school, classroom, and learning.

Fourth, this case study observed students using online sources, and recorded student
reflections on the availability and ease at which text sources were gathered online with mobile
technology, but they did not examine how well students evaluated the sources they interacted
with. Alan November (2008) refers to the process of evaluating reliability and content of online
sources as “web literacy”. Students used the internet and online sources extensively in these case
studies, but how effective students were in identifying and analyzing credible online sources was
outside the scope of this study. Researchers could utilize student interviews, classroom
observations, and analyze student work to better understand how students evaluate online
sources.
This case study can also inform future research as studies are conducted to examine the problem of communication and mobile technology. Several students were adamant that mobile technology did not eliminate barriers to learning and communication, but actually built new barriers. More studies need to be done to examine the ways in which teachers and students communicate with mobile technology, and if this communication truly benefits learning. Classroom observations in this research did not focus on direct interaction between student and teacher, but future studies could analyze ways in which student-teacher communication are influenced by technology. Also, researchers could analyze more closely student voice in regard to technology’s influence on student relationships with peers.

Finally, future research could investigate whether teachers and students fully understand the process of inquiry and carefully engage in all steps of the process. While both teachers in this study stated that they embraced inquiry learning and were committed to using it in their classroom, there are questions about whether all assignments met the characteristics of social studies inquiry, or were designed with social studies inquiry in mind. Students in this case study also stated that they knew what social studies inquiry was and that they were engaging in it in their classrooms, but the data in these case studies did not examine whether they truly understood or internalized the process of inquiry. This case study not only informs future research, but also can inform future practice in the classroom.

Implications for Future Practice

This case study generated questions that can be posed for future research, and there are also implications for future practice in the social studies classroom. Teachers interested
in social studies inquiry can examine this case to find new ways to introduce the process of inquiry in their classroom. For example, teachers can examine the extent to which students positively reacted to their 20Time projects, projects that were generated by student interest, and not devised by the teacher. Findings in this study highlight that students enjoyed much of their self-guided inquiry, and teachers might consider implementing more self-guided inquiry into their own curriculum. As teachers explore and use self-guided inquiry they can return to this case study and examine ways that directed inquiry was used. As teachers experiment with inquiry in their classroom and use this study to inform their practice, they will become more comfortable with all types of inquiry driven instruction.

Teachers in the classroom can also examine student reactions to the “overuse” of technology in the classroom and reflect on whether their activities and actions may contribute to isolation for some students. Student feelings of isolation and intrusion can interfere in the learning process, and teachers should examine their practice in an effort to limit student perceptions of isolation or intrusion when using mobile technology. Student voice in this research suggests that a balance of technology and more traditional instruction to meet the needs of all students is needed. Teachers that use technology in their classrooms can experiment and implement ways to ensure student isolation does not occur. Inquiry can be used in the classroom with both traditional face-to-face discussion and through technology. Also, students can utilize technology in some of the steps of social studies inquiry, but more traditional approaches to inquiry in other steps. Teachers in the classroom can utilize both technological tools and traditional tools in their classroom to ensure students are comfortable throughout the learning process.
Administrators and instructional coaches might apply some of the findings from this study as they consider how they might support more effective use of mobile technology in the classroom. For example, administrators can use professional development time to have teachers discuss their observations of student use of mobile technology. Administrators can provide teachers and staff with insight into how students interact with technology in the classroom, and provide opportunities for teachers to develop ways to support inquiry and technology across the curriculum. Instructional coaches may also use the findings from this study to inform their work with teachers in the classroom. As teachers look to implement technology into their classrooms, studies on student voice can inform an instructional coach’s work with teachers.

Another influence on teacher practice that cannot be overlooked is the benefits of technology in generating or assisting students in the more creative sharing of outcomes. When sharing outcomes with both teachers and peers, students embraced many of the tools of mobile technology. Students also stated that mobile technology often brought relevance to historical topics and research when generating outcomes for their research. Students found film useful in presenting topics and when discussing topics in class. Students were observed interacting with various forms of text using mobile technology and sharing insight and knowledge with the creative tools that technology offered. Even if technological tools are not essential to student understanding during inquiry, student assumptions of relevance increase the motivation to learn and engagement with inquiry. When students have access to mobile technology during social studies inquiry, teachers should allow them to utilize all of its creative potential when producing and sharing outcomes.

Finally, as schools and classrooms continue to increase student access to mobile
technology, and as society continues to encourage the use of mobile technology, teacher education programs should help new social studies teachers understand the benefits and concerns that accompany mobile technology in the classroom. Teacher education students should practice integrating mobile technology and balancing the use of mobile technology with other instructional tools. Teacher education students should also practice and hone their own skills with mobile technology to better facilitate student use when conducting social studies inquiry. As more studies emerge that examine student and teacher voice concerning mobile technology and social studies inquiry, teacher education programs should reflect on how well they are preparing instructors for a technology rich environment.

Conclusion

As teachers and schools across the curriculum implement mobile technology it will be important to continue research on the influence of technology with regards to student experience. In many American classrooms the environment has changed, as students utilize the internet and mobile devices to engage in their learning. This new learning environment has changed the way students interact with content, peers, and teachers. The influence of mobile technology on the social studies is also important to understand, as mobile technology has created a “democratization of resources” for students. Students can access resources and engage with social studies material in diverse ways, as well as use technology to generate varied outcomes. In many instances technology has influenced the way teachers and students engage in social studies inquiry. Technology has eased many of the physical barriers to inquiry in the social studies, as teachers no longer need to compile large amounts of resources, transport students to
remote labs, or plan elaborate field trips and activities.

This study was designed to examine student experience and voice in two history classrooms that were immersed in technology and dedicated to the use of inquiry. While many facets of the conceptual framework were supported in the data, more work needs to be done to understand how students navigate technology and inquiry. Students in this study enjoyed the access to resources that technology provided, but questioned whether mobile devices were lifting barriers. This study was not able to fully examine whether The New Learning Ecology proposed by Spires et al (2012) truly took shape in each of the classrooms. While many of the characteristics of The New Learning Ecology were present in the data, there were also many elements that were missing or rejected by the students. Katie’s condemnation of much of the iPad’s presence in the classroom is an example. Also, as students engage in inquiry in social studies classrooms it essential that researchers understand the ways in which students use technology to conduct inquiry. This study did examine the use of inquiry and student engagement with inquiry, but it did not examine thoroughly student thinking during inquiry. While many researchers have attempted to examine this in historical inquiry, it needs to be further examined in social studies inquiry. This study was able to explore student experience, but a more in-depth analysis of how students engage in the inquiry process with technology over an extended period of time is warranted. While this study supported many facets of the conceptual framework outlined in chapter 1, questions remain in regard to The New Learning Ecology and social studies inquiry.

Researchers interested in student experience should explore the ways in which technology has influenced not only learning, but communication, relationships, literacy, and
understanding. Exploring student voice is essential when attempting to understand lived experience in the classroom. As technology is integrated more into the classroom it is important to understand how it influences the lived experience of students, not only in social studies, but across the curriculum. This study is one example of the ways that student experience in a technology rich, inquiry driven classroom can be explored, but the possibilities for future research are endless and increasingly significant.
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Caron, E. J. (2005). What leads to the fall of a great empire? Using central questions to design issues-based history units. The Social Studies, 96(2), 51-60.


APPENDIX A

OBSERVATION PROTOCOL USED FOR THIS STUDY
- In what ways do students use mobile technology in social studies inquiry?
- How do high school students construct meaning from social studies inquiry using mobile technology?

<table>
<thead>
<tr>
<th>Duration of Classroom Observation:</th>
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<tr>
<td><strong>Descriptive Notes</strong></td>
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<td>Sketch of Classroom</td>
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<td><strong>Reflective Notes</strong></td>
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APPENDIX B

EXAMPLE OF OBSERVATION NOTES
Observation: 12/15/15
6th Hour US History - Mr. Dimah (Room 218A)

Duration of Classroom Observation: 50 minutes (12:05-1:00)

Sketch of Classroom

Descriptive Notes

- Mr. Dimah introduced the inquiry assignment the day before.
- Boy in left - "How many sentences?" - 3.4 - "Oh! - boy, can we go more than for sentences?" - D - "By not to".
- Question response - "what do we need to do?" - go through the steps, step by step - "Do we need to do?" - D - "yes".
- Group in rear - projecting work - two males, one female - using Notability to work through directions and steps, students share information and work through first step of inquiry.
- D - Addressing class - "one thing we talked about yesterday" - "Prior to your inquiry claim, what is a hypothesis?" - "Do you think there are captains of industry, or are they robber barons?" - "You are missing a big step to this, what are you setting out to prove?" - otherwise you are just walking through the forest and nobody knows where they are going.
- D - Asking students - "how did you do that?" - Referring to a technological tool in Notability and the students organization of their work.
- D - Walk around room and asks - "what do you guys think?" - "Captains of Industry?"
- "You did not need to get into the specifics of step 1 question"

Reflective Notes

- Students are arranged in random groups around the room.
- The room is a "21st century" classroom with tables and monitors.
- Students are not arranged by the teacher but choose their seats and groups for this assignment.
- 30 students total - 13 female, 17 male.

What benefit does the technology have in this assignment?

- Students using tech in different ways, some using it to guide questions and write, others using it to write on the documents and show each other.
- Students are jumping back and forth between the documents and pointing out ideas to each other.
- Students use the documents to guide their discussion throughout.
- Students used the various tools in the classroom to discuss specific points in the text.

Students are using tech in various ways to communicate with their group.

- The conversation between the group of girls is an indication of collaboration and technology.
- Teacher uses the term inquiry and eludes to the steps in inquiry, but are they down inquiry?
APPENDIX C

FOCUS GROUP PROTOCOL USED FOR THIS STUDY
Good morning/afternoon everyone I would like to start by explaining the project you have agreed to be a part of and introduce myself and my student co-researcher(s) (follow with a description of the project and introductions). I would also like to introduce some guidelines for this focus group that you should keep in mind while you are here:

1.) First, there are no right or wrong answers. We are interested in understanding perspectives about student technology use for learning social studies.

2.) Second, you should not feel that you have to agree with everyone else in this room if that’s not how you really feel. There are ___ people in this room, so we expect that people will have different views. And it’s important that we learn about all of the views that are represented here.

3.) Third, we want you to feel comfortable saying good things as well as critical things. We’re not here to promote a particular way of thinking about technology and learning. We just want to understand your perspectives, positive and critical.

4.) Fourth, we will be recording this focus group, does anyone object to being recorded? (there should not be objections at this point, as participants will be informed that they will be recorded prior to volunteering). When you say something, we ask that you talk one at a time so that we can be sure to hear everyone’s views and hear them on the recording.

5.) Fifth, when you say something we ask that you please say your name first, so that when we listen to the recording we will know who is talking.

6.) Finally, I have __________________ (introduce student co-researchers again) here to lead this focus group. They are high school students like you and also share opinions on technology and learning, although they will not be offering their opinions they will be here to keep the conversation on track, make you feel more comfortable with sharing your opinions, and help to ensure the guidelines are being followed for the duration of our time together.


Are there any questions or concerns? (address any questions or concerns) Good, let’s get started. I will set the recorder in the center of our circle here, so it can pick up all of your voices. I will sit in the corner of the room and will be listening, but I will not interject into the conversation unless absolutely necessary to do so, once again please feel free to share any all opinions.
Phase 1 Focus Group Guiding Questions:
1) Let’s start with introductions, please state your name, age, and whose social studies class you are in this year.
   a. Now, that we have introduced each other let’s go around and have each of you describe how you typically use your iPad in your social studies classroom. Be as specific as you can as you describe a typical class period.
2) If you had a visitor from another school that did not have any access to technology, how would you describe how the iPad and technology available to you helps you learn in the classroom?
3) Can you discuss how you engage in research with your iPad?
4) Can you discuss how you engage in writing with your iPad?
5) Can you discuss how you engage in discussion with your iPad?
6) How do you use you iPad to finish assignments?
7) Try to think about how the iPad helps you learn social studies material:
   How would you describe the benefits of the iPad for learning social studies material?
   How would you describe the negatives of the iPad for learning social studies material?
8) Try to think about assignments in the classroom that ask you to engage in social studies questions or topics, and develop answers to those questions through research or discussion:
   What are the benefits of the iPad when completing the assignments described (above)?
   What are the negatives of the iPad when completing the assignment described (below)?
9) Try to think about times in your classroom that you are asked to create a response, images, video, newspaper, etc to a social studies problem or question:
   What are the benefits of the iPad when completing the assignments described (above)?
   What are the negatives of the iPad when completing the assignment described (below)?
10) Can you describe the benefits of the iPad to collaboration with your peers and teachers in the social studies classroom?
11) Can you describe the negatives of the iPad to collaboration with your peers and teachers in the social studies classroom?
8.) Try to think about when you are engaged in 20Time projects in your social studies classroom:
   How would you describe the benefits of the iPad for completing 20Time tasks?
   How would you describe the negatives of the iPad for completing 20Time tasks?

Phase 2 Focus Group Guiding Questions:
1) Can we all reintroduce ourselves to refresh our memories, and for the purposes of recording?
2) Let’s revisit the following from our last meeting…*
* Phase two questions will discuss topics not addressed in the first focus group and revisit topics that the researcher and co-researchers wanted to revisit.
APPENDIX D

INTERVIEW PROTOCOL USED FOR THIS STUDY
Interview Protocol (Phase 1)

Time of Interview:
Date:
Place:
Interviewer:
Interviewee:

Questions:
1) Can we start with a few questions about you? - What is your name? How old are you? What year in school are you? Whose social studies class are you in? How do you feel about social studies? How do you feel about the use of the iPad in the classroom?

2) Can you describe how you use the iPad day-to-day in school? - …in your social studies classroom?

3) Can you tell me how you use the iPad outside of the classroom to complete social studies assignments, or learn new social studies material?

4) Describe for me how you typically use your iPad to work on your 20Time project in social studies. In school, out of school?

5) What is most enjoyable about the iPad when completing social studies assignments?

6) What is the least enjoyable about the iPad when completing social studies assignments?

7) Has your social studies instructor discussed/explained inquiry with/to you? - Can you explain how inquiry is used in your social studies classroom?

8) Can you describe how the iPad helps you engage in inquiry in your social studies classroom?

9) Can you do inquiry without technology? How? Why not?
Appendix D cont.

Interview Protocol (Phase 2)

Time of Interview:
Date:
Place:
Interviewer:
Interviewee:

Questions:

1) Do you have anything to add concerning technology and inquiry from the last time we spoke?

2) The remainder of this interview we are going to revisit topics that were addressed in focus groups and our previous interview.

** The remainder if this interview will consist of unique questions for each student, regarding their course work, focus group participation and previous interview.

IN THIS BOX – Researcher will compose unique to each student that he/she wished to explore further before the interview.
APPENDIX E

QUESTIONS ASKED OF TEACHER PARTICIPANTS DURING MEMBER CHECKING OF DATA
Post observation peer review by instructor:

1.) Can you read through the observation notes I took in your class today and let me know if you see anything that might be incorrect or misinterpreted?

If there is agreement...

2.) ask the instructor to examine all parts of the observation again and look for situations or conversations they might have seen differently.

3.) ask the instructor if they would change anything about the notes, and why?

If there is disagreement...

4.) ask the instructor to clarify how they interpreted the situation or conversation in the classroom?

- The researcher will use this conversation to reflect on observation notes and their lens when carrying out the observation. Disagreement between the instructor and the researcher over the observation notes will be consulted when analyzing the data.

Member checking of focus group and interview analysis by student co-researchers:

1.) Student co-researchers will review the transcribed notes from the focus groups and interviews for accuracy. Any disagreements will be discussed with the researcher and the researcher will reflect on the suggestions of the student co-researchers.

2.) Students co-researchers will review the analysis of the focus groups and interviews and asked to check for adult misinterpretation of student voice.

If there is disagreement...

3.) Ask the student co-researcher(s) to explain how they interpret the research the researcher analyzed. How did the researcher misinterpret student voice?

4.) Ask the student co-researcher(s) to explain their own interpretation of the data and how they would correct the analysis?

**The researcher will use the observations of the student co-researchers to reflect on analysis of interview and focus groups.
APPENDIX F

PHOTOS OF STUDENT WORK FOR 20TIME AUTOMOBILE PROJECT
APPENDIX G

“JEREMANY” WEBPAGE FOR 20TIME PROJECT
Government Services

In Government we offer a large amount of both free and paid services to all residents.

Free Services
- Free education
- Health services
- Public spaces
- Recycling programs
- Waste management
- Renting programs
- Free exercise parks
- Telephone services for the economically vulnerable

Paid Services
- In Government residents add the following services to their plans:
  - Food service
  - Home Improvement
  - Technology services
  - Area-based services
  - Security services
  - Additional telephone services

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- [Satisfied]
- [Neutral]
- [Dissatisfied]
- [Unsatisfied]
- [Other]

Click to rate.

[The website text]
APPENDIX H

MAP OF EUROPE RISK GAME 20TIME PROJECT
APPENDIX I

REVOLUTIONARY JOURNAL 20TIME PROJECT
I STARTED WITH DOING RESEARCH

To make the journal look old