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Impact of Netbook Computers on One Districts Social Studies Curriculum

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IMPACT OF NETBOOK COMPUTERS ON ONE DISTRICT'S
SOCIAL STUDIES CURRICULUM

by

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ABSTRACT

The purpose of this study was to ascertain the impact of a one-to-one netbook initiative on learning in five social studies classrooms. Quantitative and qualitative data were collected and analyzed to determine the overall impact. The researcher explored the impact on teaching and learning social studies with the primary source of curriculum delivery through one-to-one netbook computer access by students. It also focused on measuring student perception of engagement, productivity, and learning of social studies curriculum through the utilization of a netbook computer in place of a traditional textbook in a social studies classroom.

The research and data collection, through the Grand Forks Public Schools Social Studies Steering Committee, were conducted in several ways utilizing a mixed-methods approach. First, a pre-experimental design, one group pre-post-survey, was used with the students who were introduced to netbook computers in place of their traditional textbook. Second, a quasi-experimental design, pre-post-survey non-equivalent group design, was used to compare the pilot to the control. Students in the control group continued to use a textbook and the pilot group a netbook computer as a pilot for social studies curriculum.

Finally, qualitative methods were used to bring depth and perspective to the research. An analysis of student and teacher responses to open-ended questions was conducted. In addition, data were analyzed from classroom observations throughout the pilot.

Although some of the data and evidence indicated positive perceptions among the netbook pilot students, quantitative data did highlight negative growth areas in engagement, productivity, and learning within the pilot. On the other hand, qualitative data portrayed an overall positive perception of using the netbooks among the pilot students.

Keywords: netbook, computers, social studies, curriculum

CHAPTER I

INTRODUCTION

Students often list history, and social studies in general, as the most irrelevant

subject taught in high school (Loewen, 1995, p. 12). Also, compared to other curriculum

areas, the integration of technology in social studies has lagged and been traditionally

underdeveloped (Zhao, 2007, p. 330). What generally remains unknown is how

technology, such as netbook computers, could impact student engagement, productivity,

and learning of social studies curriculum. Also unknown is how, if possible, technology

can lead teachers to adopt more constructivist practices. As student access to technology

increases, it becomes important to understand the potential technology holds, if any, to

positively impact social studies education.

Traditionally, the primary focus of social studies has involved learning facts.

Students are expected to memorize important dates, places, definitions, and people

(Rice & Wilson, 1999, p. 28) to be recalled on a summative test at the end of the chapter.

For many students, learning social studies can be uninteresting as they wonder how the

curriculum is important and applicable to their lives. Social studies instruction has the

potential to be more engaging through the use of technology, but research has shown

social studies teachers lag behind other content-area teachers in the adoption of

technology for students to learn the curriculum (Zhao, 2007, p. 330). In order to impact

teaching and learning, technology integration into the K-12 social studies classroom has

been advocated by the National Council for the Social Studies (2006). Access to netbook computers and the Internet have the potential to add important dimensions to student learning and transform how social studies is taught. The challenge for educators is how to leverage technology as a means to a more engaging, relevant, productive, and personalized learning experience for all learners (U.S. Department of Education, Office of Educational Technology, 2010).

With the cost of personal learning devices or laptop computers becoming more economically feasible for schools, providing students more access to technology increases. The increased integration of technology enabling students and staff in a school setting have access to technology devices everywhere and at all times is known as one-to-one or ubiquitous computing initiatives. One form of one-to-one computing is a classroom set of personal learning devices, such as laptop or netbook computers, which each student has access within the classroom where the devices are located, but do not have the opportunity to take the devices home. Another form of ubiquitous computing provides each student with a personal learning device, such as a laptop or netbook computer, which they use in each class and have the opportunity to take home. Nonetheless, with the increase in one-to-one initiatives, research on the impact of student access to computers continues to evolve.

Although research studies have been conducted on one-to-one initiatives, few have focused specifically on the impact of ubiquitous technology initiatives on social studies teaching and learning. Another understudied topic is the relationship between technology integration and the transformation of constructivist teaching. According to Rice and Wilson (1999), constructivist activities such as active and cooperative learning

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"can be used in the social studies classroom to incorporate the use of technology to promote constructivist learning" (p. 30).

Students today are part of the net generation, also referred to as "digital natives" (Prensky, 2001a, p. 1), who have been raised with computers and the Internet. Their world outside of the classroom is very different.

> [Students' lives are] filled with technology that gives them mobile access to information and resources 24/7, enables them to create multimedia content and share it with the world, and allows them to participate in online social networks where people from all over the world share ideas, collaborate, and learn new things. (U.S. Department of Education, Office of Educational Technology, 2010, p. x)

The way the net generation learns in comparison to the way some curriculum is currently delivered contrasts at times. So, what research exists to demonstrate social studies instruction and learning can be reformed with the introduction of laptop computers in a classroom? What would the impact be if teachers incorporated more technology into their social studies curriculum? What can social studies teachers do to generate more enthusiasm for social studies curriculum and make the curriculum more interesting and meaningful?

Grand Forks Public Schools

In 2010, the Grand Forks Public Schools participated in a study to answer those questions as a way to gather data and information for an eventual social studies curriculum adoption and to strive to meet the potential outlined in the district vision statements. The Grand Forks Public Schools is located in the city of Grand Forks, North

Dakota, with a city population of 52,838 (U.S. Census Bureau, 2010). The school district serves 7,200 students within two grades 9-12 high schools, an alternative high school, four grades 6-8 middle schools, and 12 elementary schools. The district vision on curriculum states,

> In an exemplary school district, all K-12 students must have access to engaging curriculum that stimulates student thought and inquiry. Where possible it should be constructed and inspired collectively by teachers and students. Standards are central to curriculum content, and vertical and horizontal articulation of the K-12 curriculum is essential. Classrooms are created for today's 21st century learners, and the effective use of technology enhances the design, implementation and study of the curriculum. (Grand Forks Public Schools, 2010, para. 7)

The district vision on technology states,

> The Grand Forks Public Schools believe technology is an integral component of learning and is necessary to learn effectively, live productively and participate globally in an increasingly digital world. Technology resources transform learning by allowing learners to create, publish, collaborate and communicate with others in a global environment. Technology helps learners gather and analyze information, solve problems and develop higher-level thinking skills through authentic real-world experiences. (Grand Forks Public Schools, 2010, para. 1)

The vision statements on curriculum and technology provided justification for the netbook pilot study to commence.

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As a way to address the need for improved access to technology in social studies, the Grand Forks Public Schools (GFPS) Social Studies Steering Committee (SSSC) designed a research project to study the impact of netbook computers in five social studies classrooms. The netbook pilot initiative was funded by the GFPS. Teachers in three middle school and two high school social studies classrooms in the GFPS piloted a classroom set of netbook computers as an integral part of their curriculum. The study sought to understand if technology holds the potential to allow social studies to become more engaging for students.

"Student engagement has promise as a driving force in creating high-achieving schools" (Yazzie-Mintz, 2010, p. 1) because schools in which students become more interested in the content become more interested in their own learning. The U.S. Department of Education, Office of Educational Technology (2010) encourages schools to "bring 21st-century technology into learning in meaningful ways in order to engage, motivate, and inspire learners of all ages to achieve" (p. 10). Students have the opportunity to extend learning beyond what could not be done with technology, while teachers can engage students in historical inquiry through online digital primary sources (National Council for the Social Studies, 2006).

Technology also has potential to improve the overall efficiency of how students learn social studies. Hardware, such as netbooks and cell phones, and software, such as PowerPoint, word processing, and Internet based resources, such as Google Docs™ and Library of Congress, have potential to assist in student productivity. The U.S. Department of Education, Office of Educational Technology's (2010) plan, *Transforming American Education: Learning Powered by Technology*, goes on to highlight the

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importance of technology as a way to assist schools in becoming more productive while addressing student achievement (pp. 63-65).

Research has shown "when social studies is taught through an active, student-centered approach, students do learn and remember important content" (Teachers' Curriculum Institute, 2010, p. 2). Constructivist teaching practices encourage active, rather than passive learning, and use cooperative learning and critical thinking activities (Rice & Wilson, 1999, p. 30). So, would technology encourage an increase in constructivist teaching practices? In 2006, the National Council for the Social Studies used Mason et al.'s (2000) work to make the connection between the opportunities technology holds to impact "learning social studies skills and content in ways impossible in the traditional classroom" (para. 7). So,

> if we hope to make learning relevant and meaningful for students in the 21st century, social studies classrooms need to reflect this digital world so as to better enable young people to interact with ideas, information, and other people for academic and civic purpose. (National Council for the Social Studies, 2009, para. 3)

Technology may hold the key to enhance engagement, improve productivity, and rejuvenate learning in social studies. Recently, the U.S. Department of Education's (2010) National Education Technology Plan states with technology, learning will become more engaging, student learning will improve and higher levels of productivity will be achieved (pp. x, xiv). According to Secretary of Education Arne Duncan, "'we have an unprecedented opportunity to reform our schools....With the technology plan, we have laid out a comprehensive vision for how teachers working with technology can transform

student learning in classrooms'" (para. 2). With the support of the U.S. Department of Education, reform with technology may gain more momentum.

Purpose

The purpose of this study was to ascertain the impact of a one-to-one netbook initiative on learning in five social studies classrooms. Quantitative and qualitative data were collected and analyzed to determine the overall impact. Quantitatively, perception data, through a pre and post survey, were analyzed through a quasi-experimental design in order to understand the impact of the pilot. In the pilot groups, each student had access to a netbook computer while the control groups used traditional means of curriculum delivery such as a textbook. The impact on student engagement, productivity, and learning of social studies through the utilization of a netbook computer was explored in the study. Qualitatively, data from classroom observations and teacher and student answers to open-ended questions and statements were coded and categorized to further understand the impact of the netbook pilot.

Significance of Study

As part of the curriculum review cycle of the GFPS, the social studies department, under the leadership of the department chairs and curriculum director, established a K-12 steering committee to facilitate the study and review throughout the 2009-2011 school years and oversee piloted social studies curriculum during the 2011-2012 school years. Throughout the study and review, best practices, 21st century learning skills, considering a classroom without a textbook, and envisioning a social studies classroom several years beyond 2011 were explored. Because of the limited research-based studies of social studies classrooms with netbook computers in place of or supplement to traditional

textbooks, an idea to pilot both traditional textbooks and netbook computers in place of textbooks through the 2010-2011 school year was initiated in order to establish local data (Appendix A).

Another aspect of the study focused on understanding social studies teaching and learning before and after the netbook pilot. Oftentimes, the primary focus of social studies involves learning facts. Students are expected to memorize important dates, places, definitions, and people (Rice & Wilson, 1999, p. 28) to be recalled on a summative test at the end of the chapter. In fact, compared to other content-area teachers, social studies teachers have been marked by a greater deficiency in terms of their use of innovative teaching methods made possible by various technologies (Shriner, Clark, Nail, Schlee, & Libler, 2010, p. 37).

Researcher's Background

The researcher wore multiple "hats" and had a vested interest in this study. The researcher holds a bachelor of science degree, with a major in social studies, and taught social studies for 10 years. After teaching, the researcher moved on to an administrative position and has remained connected to social studies as the chair of the district secondary social studies department for the past 8 years. Finally, as an instructional leader in one of the GFPS high schools, a chair of the GFPS secondary social studies department, and as a member of the K-12 SSSC, the researcher had a vested interest and obligation to advance the district's vision in curriculum and technology. The researcher initiated the netbook pilot and was the project leader.

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Research Questions

1. What were students' perceptions of engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

2. What were teachers' perceptions of engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

3. What constructivist teaching practices emerged in a social studies curriculum environment with each student having access to a netbook computer?

Definitions

The following terms are defined to provide meaning and understanding in relation to this study:

21st century learning: focuses on creativity, critical thinking, communication, and collaboration in order to prepare students for a more complex life and work environment in the future (Partnership for 21st Century Skills, 2009, p. 3).

Constructivism: is based on the idea that "students…learn best when they are socially interacting within an authentic situation that is relevant to their prior knowledge and goals, and that fosters autonomous and self-directed functioning" (Doolittle & Hicks, 2003, p. 12).

Digital native: refers to today's students who are native speakers of technology, fluent in the digital language of computers, video games, and the Internet (Prensky, 2005/2006, p. 9).

Engagement: the amount of time and effort students put into their studies and other educationally purposeful activities and how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning (National Survey of Student Engagement, 2011, para. 1).

Google Docs™: a free, web-based word processor, spreadsheet, presentation, form, and data storage service offered by Google. It allows users to create, edit, and share documents online while collaborating in real-time with other users.

Learning: acquiring knowledge or skills through instruction and/or study.

Media literacy: "includes the skills of accessing, analyzing, evaluating, creating, and distributing messages as well as the cultural competencies and social skills associated with a growing participatory culture" (National Council for the Social Studies, 2009, para. 9).

National Council for the Social Studies (NCSS): professional association for social studies educators.

Netbook: small, light, and inexpensive laptop computer designed for basic computing functions and accessing web-based applications.

Net generation: the first generation to grow up surrounded by digital media, born between 1977 and 1997 (Tapscott, 1998).

One-to-one (1:1) computing:

(1) providing students with use of portable laptop computers loaded with contemporary productive software, (2) enabling student to access the Internet through schools' wireless networks, and (3) a focus on using laptops to help

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complete academic tasks such as…assignments, tests, and presentations.

(Penuel, 2006, p. 331)

Productivity: ways to become more efficient while increasing the capacity to teach, learn, and complete educational tasks.

Professional development: "a comprehensive, sustained and intensive approach to improving teachers' and principals' effectiveness in raising student achievement" (National Staff Development Council, 2011, para. 3).

Social studies: "the integrated study of the social sciences and humanities to promote civic competence" (National Council for the Social Studies, 2010, p. 3).

Technology: in this study, refers to the use of netbooks to access Internet resources and software in a classroom setting.

Technology integration: incorporation of technology resources and practices into curriculum and classrooms.

Textbook: systematically organized material designed to provide a specific level of instruction in a subject matter category (Indiana State Board of Education, 2009).

Ubiquitous computing: students and staff in a school setting having access to technology devices everywhere and at all times.

<p style="text-align:center">Assumptions</p>

The assumptions of this study are:

1. The students understood the survey and responded honestly.

2. The students' perceptions of engagement, productivity, learning, and technology were measured appropriately through the survey.

3. The students responded honestly to the open-ended post survey question/statement.

4. The teachers responded honestly to the open-ended questions and statements throughout the study.

5. The researcher coded, categorized, and conceptualized the qualitative data appropriately and validated the data.

Delimitations

This study focused only on 5 classroom teachers: 3 middle school and 2 high school social studies teachers in the GFPS who applied and volunteered to be a part of the netbook pilot study. Random assignment in this study was not truly random because the students were exposed to the netbook computers based on their teachers' willingness to pilot the netbook computers. By nature, the volunteer teachers were, potentially, already technologically competent and may also have been exemplary teachers who were innovative in the classroom regardless of the means to deliver curriculum. Finally, because of the limitations placed on the netbook pilot initiative and study by the GFPS, the study was only conducted through the 2010-2011 school year.

Organization of Study

The study has been organized in five chapters. Chapter II provides a brief history and evolution of technology in K-12 education, teaching practices and philosophies over the past century, and a description of the students in K-12 classrooms today. In addition, research was conducted and synthesized on engagement, productivity, and 21st century learning; social studies curriculum and instruction; social studies teaching and learning with technology; constructivism: teaching and learning in relation to social studies and

technology; and ubiquitous computing initiatives. Chapter III presents the methodology

and the design of the study. Chapter IV presents the findings of this study through

quantitative and qualitative means. Chapter V presents a summary, conclusion,

discussion, limitations, recommendations, and reflections on the study.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to analyze quantitative and qualitative data

collected by the GFPS SSSC regarding the overall impact of a pilot netbook initiative in

five social studies classrooms. In general, Chapter II presents historical foundations of

technology and the integration into social studies classroom teaching and learning.

Specifically, the review is divided into seven parts: (a) a brief history and evolution of

technology in K-12 education; (b) teaching practices and philosophies over the past

century; (c) a description of the students in K-12 classrooms today including engagement,

productivity, and 21st century learning; (d) social studies curriculum and instruction;

(e) social studies teaching and learning with technology; (f) constructivism: teaching and

learning in relation to social studies and technology; and (g) ubiquitous computing

initiatives.

Looking back over the technologies introduced into American schools over the

past century, themes exist; financial limitations, top down initiatives, society driven

initiatives, community influence, school board, and adapting to the change has often led

to teachers resisting the particular change, and, in many cases, technology. At the turn of

the century, classroom instruction would look closely as it does today in many

classrooms: divided by grades, desks in rows, course of study set, homework, textbooks,

teacher lectures, student tests (Cuban, 1986, p. 9). Today, students not only have

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personal access to all of the technologies which have been used and currently used in school settings, but also have all of the technology in a personal device kept in their pocket. How has technology evolved throughout the past century?

A Brief History and Evolution of
Technology in K-12 Education

In the early 1900s, Thomas Edison's contributions to the motion picture industry were predicted to have an impact on education. In 1913, Edison (as cited in Cuban, 1986) claimed, "'Books will soon be obsolete in the schools'" (p. 11). Nine years later, Edison (1922) made bold claims about how the new technology would further change education:

I believe that the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks.

The education of the future, as I see it, will be conducted through the medium of the motion picture. (as cited in Cuban, 1986, p. 9)

Through the 1920s and 1930s, classroom use of film for instruction was viewed as progressive and innovative, but was not integrated widespread due to the cost of the equipment and availability of films (Cuban, 1986, pp. 12, 19).

In the 1920s, radio made its way into the classroom as another innovation to revolutionize education. By 1932, Benjamin Darrow proclaimed the possibilities of the radio "'to bring the world to the classroom…as a vibrant and challenging textbook of the air'" (as cited in Cuban, 1986, p. 19). William Levenson wrote, in 1945, "'the time may come when the portable radio receiver will be as common in the classroom as is the

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blackboard. Radio instruction will be integrated into school life as an accepted educational medium'" (as cited in Cuban, 1986, p. 19). Like the motion picture industry, radio did not have an impact on education, mainly because television emerged as the new technology in education.

By the 1950s, the "growing criticism of school quality across the nation, harnessed to heightened concerns about overcrowded schools, established a context for identifying improved schooling as a priority, even prior to the Soviets orbiting their satellite [Sputnik]" (Cuban, 1986, p. 28). Nonetheless, "television, it seemed, could be a catalyst for student literacy and learning" (Baker, 2010, p. 137). But, "when the baby boomers were teenagers, it was television's turn to establish itself as the most powerful information technology in history. TV's impact on society in general and the boomers in particular was profound" (Tapscott, 1998, p. 2). Television was now available as an educational tool for the classroom setting, but it "was hurled at teachers. The technology [television] and its initial applications to the classroom were conceived, planned, and adopted by nonteachers...[and] reformers interested in improving instructional productivity" (Cuban, 1986, p. 36).

Film, radio, and television were each touted as the next big technology to reform education, but each became merely another piece of equipment in the classroom. "How frustrating teacher behavior must have been to promoters of radio, film, and instructional television. School boards bought machines, principals installed them in schools, and teachers occasionally used the technology" (Cuban, 1986, p. 51). Over the past century, why have teachers been reluctant to embrace the new technologies, integrate it into their instruction, and change their teaching practices? Javad Maftoon (1982) explains,

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It has been found that teachers reject or at least resist change because of failure to recognize the need for improvement, fear of experimentation, unwillingness to give time, and disillusion or frustration with past experiences. In addition teachers traditionally tend to be conservative and usually will not be impressed by the results of investigations and research or new theories of education. (as cited in Cuban, 1986, p. 51)

With the introduction of the computer in schools in the 1980s, would teachers embrace the integration of computers into K-12 instruction?

The 1980s marked the decade in which computers first began to arrive in schools in significant numbers. After film, radio, and instructional television failed to produce significant reform in education, predictions of how computers would reshape student learning began. As desk-top computers became less expensive "and the promise of each student interacting with a personal computer, claims for a classroom revolution surfaced again" (Cuban, 1986, p. 73). In 1984, Seymour Papert made a prediction about computers in relation to education:

There won't be schools in the future....I think the computer will blow up the school. That is, the school defined as something where there are classes, teachers running exams, people structured in groups by age, following a curriculum – all of that. The whole system is based on a set of structural concepts that are incompatible with the presence of the computer....But this will happen only in the communities of children who have access to computers on a sufficient scale. (as cited in Cuban, 1986, p. 72)

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Many wondered the impact computers would have in education. Many also wondered how teachers would or would not embrace the computer revolution.

Needless to say, the computer revolution was in its infancy. Cuban (1986) describes the evolution of computer use in schools. In the early 1980s, "most reports of school use of computers describe one or two machines in a classroom, or a room equipped with ten to twenty desk-top microcomputers" (p. 82). In 1981-1982, a survey of computer use "calculated that almost 5 million students averaged nine hours each in front of a computer during the entire year" (p. 79). By 1984, 68% of the schools in the nation had at least one computer "while the typical secondary school had just over 13" (p. 79). In U.S. schools, the student ratios per computer, in 1981, was 125 to 1 while in 1991 was 18 to 1 and by 2000 dropped to 5 to 1 (Cuban, 2001, p. 17). The upward trend of computers in education would continue and would eventually evolve into a more ubiquitous experience for students.

"The integration of computer technologies into U.S. classrooms over the past quarter century has arguably led to a widespread shift in the U.S. K-12 educational landscape" (Bebell, O'Dwyer, Russell, & Hoffmann, 2010, p. 30). Although the level of integration of technology continues, each school's definition and vision continues to look very different. While some schools continue to use computer labs for technology purposes, many others are bringing the technology into the classroom through the use of laptops, netbooks, or portable learning devices which have wireless Internet access. In order to encourage schools to integrate more technology into K-12 education, the U.S. Department of Education, Office of Educational Technology (2010) released its technology plan titled *Transforming American Education: Learning Powered by*

Technology. Secretary of Education Duncan describes the importance: "'Our nation's schools have yet to unleash technology's full potential to transform learning….We're at an important transition point. We need to leverage technology's promise to improve learning'" (para. 5). Collins and Halverson (2009) also advocated for an increase of technology because it "fosters a more hands-on, activity-based education. Computers are highly interactive and provide…[the learner with a wide assortment of computer] tools to accomplish meaningful tasks…'learning by doing' view of education" (p. 20). Simply adding technology to K-12 classrooms may not yield positive results without the willingness, support, and dedication of teachers.

<div align="center">

Teaching Practices and Philosophies
Over the Past Century

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As computers entered and continue to enter schools at an exponential pace, one constant remains, the classroom teacher. Researchers, including Wright, Horn, and Sanders (1997), stress the fact that the teacher continues to be the most important factor affecting student learning (p. 63). In order to understand how teachers did or did not adapt to having students use computers for learning, an understanding of teacher pedagogy will be explored. Through an overview of teaching practices and philosophies throughout the past century, links will be made to how each philosophy may or may not embrace technology in the classroom.

Through the summarization of classroom teaching practices over the past century, reoccurring themes can be determined. Collins and Halverson (2009) summarize the past century and, for the most part, current model of education:

In the mass-schooling model, the teacher is an expert whose job is to transmit that expertise to large groups of students through lecture, recitation, drill, and practice. The curriculum spells out what students are to learn and in what order, and testing is carried out to determine whether students have learned what was covered. If students have learned the appropriate content, they are allowed to advance to the next grade, acquiring as they advance a record of courses taken and grades assigned. The technologies undergirding this system are the textbook with its scope and sequence, the blackboard and overhead projector to support teacher explanations and display student work, the copier machine to reproduce handouts and worksheets, and most centrally, paper and pencil for recording and assessing student work. (p. 4)

Themes of teacher centered instruction, including notes, worksheets, and tests, are evident through much of the research over the past century (Cuban, 1986, pp. 81-82; Tyson, 2010, p. 118). In general, classroom instruction today remains similar as it was a century ago. Over the remainder of this section, three major teaching philosophies of the past century will be explored: progressivism, essentialism, and constructivism.

Because typical classrooms were teacher centered, John Dewey developed progressivism into an educational reform movement around the turn of the 20th century. According to progressivism, "skills and tools of learning include problem-solving methods and scientific inquiry...[and] learning experiences should include cooperative behaviors" (Ornstein & Hunkins, 2004, p. 44). In addition, Ornstein and Hunkins indicated progressive education "focused on the child as the learner rather than on the subject, emphasized activities and experiences rather than verbal literacy skills, and

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encouraged cooperative group-learning activities rather than competitive individualized lesson learning" (p. 46). In the early part of the 20th century,

> progressivism challenged the formal, mechanical, and lifeless instruction described by critics in so many classrooms. Pedagogical progressives called for instruction that built upon student interests, that opened up classroom windows to the larger world, and that plunged students into activities that had intellectual and social outcomes. The teacher's role was to be coach and adviser, not drill sergeant. Classroom activities embraced projects that students and teachers jointly determined and explored; there was to be much interplay among students and much physical movement in the room. (Cuban, 1986, p. 10)

Dewey (1938) argued against traditional or essentialism education because it imposed standards, required subject matter, forbade active participation, and made students learn what was "already incorporated in books and in the heads of elders" (p. 19). Progressivism opposes traditional or essentialist school practices such as the teacher as the authoritarian, learning information from a textbook, memorizing content, and disciplining by fear (Ornstein & Hunkins, 2004, p. 46). Progressive thinkers believe students should be taught how to think instead of merely what to think (Ornstein & Hunkins, 2004, p. 44). In addition to learning critical thinking skills, progressivism indicates students should be given opportunities to learn cooperatively, through inquiry and problem solving. Much of Dewey's work is evident in what is known today as 21st century learning skills.

Initially emerging in the 1930s as a response to progressivism, essentialism was developed as a major educational philosophy in the 1950s and 1960s by William Bagley.

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The philosophy emerged during the cold war and Sputnik era and gained even more momentum as a response to A Nation At Risk in 1983 and eventually the current NCLB legislation (Ornstein & Hunkins, 2004, pp. 40-41). According to Ornstein and Hunkins, the basic principles of essentialism are (a) mastery of core subjects and basic skills; (b) students need to be serious, dedicated, and hard working; and (c) the teacher is the master of their subject and disseminator of information (p. 41). Essentialists contend "teachers are responsible for leading whole classes of students and for the setting of high expectations and directing student learning toward measurable ends" (Imig & Imig, 2006, p. 168). Collins and Halverson (2009) describe the essentialist or traditional classroom teacher:

> Schooling is built on the notion that the teacher is an expert, whose job is to pass on his or her expertise to students. The legitimacy of traditional classroom instruction rests on the teacher's expertise as the source of legitimate knowledge. For many years, teacher education has focused on providing teachers with disciplinary knowledge and on the methods to teach this knowledge in classrooms. Textbooks are written to support these kinds of knowledge-based teacher expertise, because they serve to define the scope of information that students are expected to learn and teachers are responsible for teaching. (p. 44)

As a response to the progressive movement, the traditional classroom, in large part, subscribes to the essentialist theory. The back-to-basics essentialist curriculum has been a key component of NCLB over the past decade and the current standards movement. Essentialists argue all students must achieve the basics skills and meet the minimum standards in the core curriculum areas of reading, writing, and math in order to

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be considered ready for life beyond high school (Ornstein & Hunkins, 2004, p. 41). In the current era of accountability under NCLB, schools have focused on those areas which are measured to determine AYP, such as reading, writing, and math.

While essentialism was gaining momentum in the 1950s and 1960s, constructivism also emerged as another prominent perspective among public educators. The general constructivist view maintains individuals construct knowledge through interpreting their own experiences. "Jean Piaget [1954], one of the most influential proponents of constructivist theories, held the view that children construct knowledge of the world through assimilation and accommodation" (as cited in Rice & Wilson, 1999, p. 28). Based on Piaget's work, Rice and Wilson define constructivism:

> In constructivist classrooms, learning is promoted through collaboration among the students and with the teacher, higher-order thinking and problem solving are encouraged; the teacher attempts to relate subject matter to the students' lives; the students are allowed to construct their own knowledge and avoid repeating a right or wrong answer; and the teacher acts as a facilitator and guide. Most constructivist theories stress learning through exploration rather than by simply giving a correct answer. (p. 29)

The general principles of constructivism have been challenged and often set aside because of the current standards and accountability movement. But, constructivist principles can be found in what is known today as 21st century learning skills.

In the last decade of the 20th century, the idea of 21st century learning skills emerged. Defined by the Partnership for 21st Century Skills (2009), 21st century learning skills highlights the key components of a 21st century learner which are essential

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beyond the core academic subjects, including "critical thinking, problem solving, communication and collaboration" (p. 1). Constructivist and progressivist educational philosophies share many similar components of 21st century learning including problem solving, critical thinking, inquiry, cooperative learning, collaboration, and communication (Collins & Halverson, 2009; Jacobs, 2010; Marzano, 2003; Ornstein & Hunkins, 2004). Even with an increasing focus on 21st century learning skills, traditional teaching practices continue.

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A Description of the Students in
K-12 Classrooms Today

</div>

Education includes two key components: the teachers and the learners. The previous section explored teaching practices over the past century while this section shifts focus to the learner or students in classrooms today. "Educators in the 21st century realize that students entering the classroom today are much different from those who have come before....To make authentic connection with students, ...[teachers] must change...[their] strategies to fit this new age of students" (Sheskey, 2010, p. 197). The following section will highlight today's learners who have grown up with technology, known as the *net generation* or *digital natives*, and explore how students learn and desire to learn in the 21st century. For the purposes of this study, the terms *net generation* and *digital natives* will be used interchangeably.

Tapscott first coined the term net generation to refer to the generation of children who, in 1999, would be between the ages of 2 and 22 (1998, p. 3) and in 2009 the net generation is between the ages of 11 and 31 (2009, p. 3). According to Tapscott, the net generation "is the first to grow up surrounded by digital media" (1998, p. 1) and

"instinctively turn first to the Net to communicate, understand, learn, find, and do many things" (2009, p. 9). While students use technology 24/7 outside of school, their experience in school is much different. For a variety of reasons, schools and teachers have not embraced technology for learning as quickly as K-12 students would like. Students today are not content to sit in a classroom and listen to a teacher lecture, but would rather have a conversation, choices in what they learn, learning be relevant to the real world, and learning be interesting and fun (Tapscott, 2009, p. 126). Gaining an understanding of how students today learn and want to learn will be important in order for educators to keep students engaged in meaningful learning.

Students in today's classrooms are comprised of a generation which does not know what society was like before technology.

> I've coined the term *digital native* to refer to today's students (2001). They are native speakers of technology, fluent in the digital language of computers, video games, and the Internet. I refer to those of us who were not born into the digital world as *digital immigrants*. We have adopted many aspects of the technology, but just like those who learn another language later in life, we retain an "accent" because we still have one foot in the past....Our accent from the predigital world often makes it difficult for us to effectively communicate with our students.
>
> (Prensky, 2005/2006, p. 8)

Because students have grown up in an environment in which technology is everywhere, Prensky (2001a) concluded "students think and process information fundamentally differently from their predecessors" (p. 1), which leads to the challenge of *digital immigrants* teaching *digital natives*.

In contrast to digital natives, digital immigrants "were not born into the digital world but have...become fascinated by and adopted many or most aspects of the new technology" (Prensky, 2001a, pp. 1-2). Even with digital immigrants adapting to technology, "the single biggest problem facing education today is that our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language" (Prensky, 2001a, p. 2). In other words, teachers continue to maintain existing teaching practices. Prensky (2001a) goes on to describe the interplay between teachers and students:

Digital Immigrant teachers assume that learners are the same as they have always been, and that the same methods that worked for the teachers when they were students will work for their students now....Often from the Natives' point of view their Digital Immigrant instructors make their education not worth paying attention to compared to everything else they experience – and then they blame them for not paying attention! (p. 3)

Just four years later, Prensky (2005/2006) further advanced his point to encourage educators to put

engagement before content when teaching....[Teachers] need to laugh at their own digital immigrant accents, pay attention to how their students learn, and value and honor what their students know. They must remember that they are teaching in the 21st century. This means encouraging decision making among students, involving students in designing instruction, and getting input from students about how they would teach. Teachers needn't master all the new technologies. They should continue doing what they do best: leading discussion in the classroom.

But they must find ways to incorporate into those discussions the information and

knowledge that their students acquire outside class in their digital lives. (p. 9)

The call for teachers to adjust their pedagogy was made. Incorporating technology was a

key component, but an understanding of how students today learn is equally important.

In November 2010, the U.S. Department of Education, Office of Educational

Technology released the National Education Technology Plan titled *Transforming*

American Education: Learning Powered by Technology. The plan provides rationales

and encouragement for educators, schools, and administrators to advance technology

among their students. Students' lives outside of school include technology that

gives them mobile access to information and resources 24/7, enables them to

create multimedia content and share it with the world, and allows them to

participate in online social networks and communities where people from all over

the world share ideas, collaborate, and learn new things. (U.S. Department of

Education, Office of Educational Technology, 2010, p. 9)

The document continues by challenging "our education system…to leverage technology

to create relevant learning experiences that mirror students' daily lives and the reality of

their futures" (p. 9).

Similarly, Collins and Halverson (2010) provide additional justifications for

educators to understand how students today learn:

The world of education is currently undergoing a second revolution. Digital

technologies such as computers, mobile devices, digital media creation and

distribution tools, video games and social networking sites are transforming how

we think about schooling and learning. All around us, people are learning with

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the aid of new technologies: people of all ages are playing complex video games; workers are interacting with simulations that put them in challenging situations; students are taking courses at online high schools and colleges; and adults are engaging in social networks and online learning environments to manage their professional lives. New technologies create learning opportunities that challenge the traditional practices of schools and colleges. These new learning niches enable people of all ages to pursue learning on their own terms. People around the world are taking their education out of school and into homes, libraries, Internet cafes and workplaces where they can decide what they want to learn, when they want to learn and how they want to learn. (p. 18)

If we begin with an assertion that students today who have not known life without technology are less patient with traditional methods of teaching such as filling out worksheets and listening to lectures (Collins & Halverson, 2009, p. 3; McNeely, 2005, p. 4.3; Oblinger & Oblinger, 2005, p. 2.16), then an understanding of how today's students learn is critical. Today's students thrive in learning environments that are experiential, interactive, and social.

Students of the net generation want learning to be experiential. In his book, *Experience and Education*, Dewey (1938) stressed the importance of experiential education: "There is an intimate and necessary relation between the processes of actual experience and education" (p. 7). The net generation has been described as "experiential, engaged, and constantly connected" and thrive in "learning environments which are active, social, and learner-centered" (Ramaley & Zia, 2005, p. 8.7). Learning should be participatory. Students "get bored if not challenged properly, but when challenged, they

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excel in creative and innovative ways" (McNeely, 2005, p. 4.3). Most net generation learners prefer to learn by doing rather being told what to do. Students learn best through discovery and exploration by themselves or with other students. This exploratory style helps them to better retain information and use it in creative and meaningful ways (McNeely, 2005, p. 4.3; Oblinger & Oblinger, 2005, p. 2.6; Tapscott, 1998, p. 144). According to Oblinger and Oblinger, experiential learning does not necessarily mean all technology, but rather the experiential level of the learning activity that makes learning engaging (p. 2.16).

Students of the net generation want learning to be interactive. Because of the low level of interactivity, lecture does not work well with the net generation (McNeely, 2005, p. 4.7; Oblinger & Oblinger, 2005, p. 2.13). Students want interactivity with a computer, teacher, or classmates, but traditional school provides very little (McNeely, 2005, p. 4.7; Prensky, 2001b, p. 4). In addition, students today exist in image-rich environments and have become increasingly disinterested with reading large amounts of text (Oblinger & Oblinger, 2005, p. 2.7). The net generation has a predisposition toward inductive discovery, making observation, formulating hypotheses, and figuring out the rules. So, if a class is not interactive or engaging, students will often choose to not pay attention (Oblinger & Oblinger, 2005, p. 2.7; Prensky, 2001b, p. 4). Technology has the potential to address the interactivity void; but, technology alone does not increase interactivity. For example, a teacher "who uses PowerPoint in a lecture is not using technology interactively. Technology must be relevant and interactive to the coursework" (McNeely, 2005, p. 4.9) because it's the technology which "makes it possible to provide learners with anytime, anywhere content and interactions" (Oblinger & Oblinger, 2005, p. 2.13).

Students of the net generation also want learning to be social. Students feel learning through social interaction is natural and important and working in groups or teams is the norm (McNeely, 2005, p. 4.5; Oblinger & Oblinger, 2005, p. 2.7). According to McNeely, "net geners like the social interaction that comes with being in the class with their peers. While they may use technology in their daily lives, relationships are a driving force in the learning process" (p. 4.5). From a student's perspective, educators should keep in mind "successful learning is often active, social, and learner-centered" (Oblinger & Oblinger, 2005, p. 2.16). The learning environment becomes even more complex as educators integrate skills for the 21st century.

Engagement, Productivity, and 21st Century
Learning in K-12 Settings

Current research has underscored the skills students need to be successful not only in K-12 settings, but for life, career, and education beyond. Similar to the desire of students to learn in experiential, interactive, and social environments, the underlying themes of engagement, productivity, and learning (specifically 21st century learning) assist students to become more successful in K-12 education and in work, careers, and education environments. Although learning the skills of engagement, productivity, and 21st century learning is important independently, technology may play an integral role in students maximizing their potential in each area. In each subsequent section on engagement, productivity, and 21st century learning, it is important to also ask the question concerning how technology may contribute to each one.

Engagement

Engagement is defined by the National Survey of Student Engagement (2011) as the amount of time and effort students put into their studies and other educationally purposeful activities…and how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning. (para. 1)

While the engaged and motivated student does well academically, the disengaged or unmotivated high school student considers dropping out as a viable option (Ramaley & Zia, 2005, p. 8.2). In fact, Wagner's (2008) research shows motivation and dropping out from high school go hand in hand: "In a national survey of nearly 500 dropouts from around the country, about half of these young people said they left school because their classes were boring and not relevant to their lives or career aspirations" (p. 114). Collins and Halverson (2009) claim intrinsic motivation is not appropriately developed in students within our current school system (p. 131). Many factors contribute to students becoming disengaged from school. Yazzie-Mintz's (2010) engagement study revealed 81% of the students stated a reason for their boredom was the material wasn't interesting, while 42% cited the lack of relevance of the material (2010, p. 11). What would lead to positive student engagement?

In order to address engagement, Ramaley and Zia (2005) posed the question, "How many teachers take time to assure themselves that every student has truly participated in a classroom setting and that the exchange is meaningful?" (p. 8.16).

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Yazzie-Mintz's (2010) survey of students on engagement reveals classroom practices that engage or excite them:

> Students rated most highly those methods that involve work and learning with their peers. "Discussion and Debate" was rated as to some degree or very much exciting/engaging by about 61% [of the students]. "Group Projects" were rated similarly: 60% of respondents rated this instructional method as to some degree or very much exciting/engaging. Students also are excited/engaged by instructional methods in which they are active participants; nearly half the respondents were engaged/excited to some degree or very much by these methods of instruction: "Presentations" (46%), "Role Plays" (43%), and "Art and Drama Activities" (49%). (p. 11)

According to Cuban (2001), in an engaging classroom

> teachers are closer to being coaches than drill instructors. They structure activities that give students choices while pressing them to learn subject matter in greater depth. These practices engage students…and connect to learning outside the classroom. Sometimes called "student-centered teaching" or "constructivist practices," these forms of teaching, less evident in American classrooms, are, according to reformers,…essential for student learning in the twenty-first century. (pp. 14-15)

Simply "moving students beyond being mere participants in the class to become active learners and discoverers" (Windham, 2005, p. 5.12) will advance engagement. Being students today are continually connected with technology in their personal lives,

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educators may make learning environments more engaging through an increase of the integration of technology.

As the integration of technology increases, the potential of technology positively inpacting student engagement also increases. Yazzie-Mintz's (2010) study included a question on technology and engagement; "'Projects and Lessons Involving Technology'…was chosen by 55% of students as an instructional method that was exciting/engaging either to some degree or very much" (p. 11). Instructional technology "can engage students and give more opportunity for deeper thinking. Teachers who train themselves to ask deeper-level essential questions will develop better problem-solving skills in their students" (Sheskey, 2010, p. 209). "Technology-based learning resources can give learners choices that keep them engaged in learning, for example, by providing personally relevant content, a customized interface, options for difficulty level or alternative learning pathways, or choices for support and guidance" (U.S. Department of Education, Office of Educational Technology, 2010, p. 17). Technology continues to have potential to enhance engagement in today's students.

The integration of technology may hold the key for educators to make learning more engaging and prepare students for the future (Collins & Halverson, 2009, p. 111; Wagner, 2008, p. 188; Yazzie-Mintz, 2010, p. 11). Prensky (2005/2006) states, "If educators want to have relevance in this century, it is crucial that we find ways to engage students in school…we must engage them in the 21st century way: electronically" (p. 2).

Productivity

Student productivity can be defined as the production of work a student accomplishes: completing assignments, completing a project, taking an assessment, using

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time in class efficiently, researching a topic, word processing, taking notes, and producing quality work. Student productivity could include the use of a technology device or not. Every day, students "are tapping into a wide range of technology tools and services to enhance their learning productivity" (Project Tomorrow, 2011, p. 2). The question often gets posed: Does student access to technology increase student productivity? This section focuses on student productivity in conjunction with the integration of technology and personal learning devices.

With the introduction of computers, the search for greater classroom and educational productivity ensued (Cuban, 1986, p. 73). In 2001, Schaumburge conducted a quasi-experimental study examining the effect that laptops had on student technological literacy. "She found that the laptop students made greater gains than did comparison group students on a researched-developed test of their knowledge of…common productivity tools" (as cited in Penuel, 2006, p. 340). According to the 2009 Speak Up survey, students "recognize from their own experiences growing up immersed in digital media that the best way to drive educational productivity is through the effective use of rich and relevant digital tools" (Project Tomorrow, 2010, p. 25). The U.S. Department of Education has also recently reinforced the importance of improving productivity. "We need to make the fundamental structural changes that technology enables if we are to see dramatic improvements in productivity…to learning, assessment, and teaching processes" (U.S. Department of Education, Office of Educational Technology, 2010, p. 64).

21st Century Learning

According to the Partnership for 21st Century Skills (2009), 21st century learning prepares students for a more complex life and work environment in the 21st century. A

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focus on critical thinking, communication, collaboration, and creativity is essential to prepare students for the future (p. 3). Historically speaking, according to Tapscott (1998),

> the field of education has been oriented toward models of learning which focus on instruction. The term *teacher* implies approaches to learning where an expert who has information transmits…it to students. Those students who are "tuned in" take the information they are "taught."…It has long been thought that through repetition, rehearsal, and practice, facts and information can be stored in longer-term memory, which can be integrated to form larger knowledge structures. (p. 129)

The 21st century learning skills of critical thinking, communication, collaboration, and creativity will be explored in the following sections.

Critical Thinking

> Gordon defines critical thinking as
>
> the ability to apply abstract knowledge to solve a problem and to develop and execute a solution – the ability to think broadly and deeply. It means having and using a framework for problem-identification – assumptions and facts, acquiring information, viewing alternative solutions. Another part of critical thinking is surrounding yourself with people who have differences of opinion and who can help you come to the best solution. (as cited in Wagner, 2008, p. 22)

Asking good questions, problem solving, being curious, and wondering why something is important are all essential components of critical thinking (Wagner, 2008, p. 15; Sheskey,

2010, p. 209). Employers and society need students to have learned the ability to figure things out and execute appropriate solutions.

Communication

Communication is another component of 21st century learning. According to the Partnership for 21st Century Skills (2009), communication means to "articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts" (p. 4). Although they communicate much different than any point in history, students are social and have the ability to communicate for social or academic purposes. Because of that fact, students today have become increasingly impatient with lecture-type learning, as was evident in Yazzie-Mintz's (2010) study revealing "Discussion and Debate" as the highest exciting/engaging component of learning (p. 11). Even in a digital age, both written and oral communication continue to be important.

Collaboration

Collaboration is another component of 21st century learning. Other terms often used for collaboration are teamwork and cooperative learning. Regardless of which term is used, students "love working with their friends…they should be able to choose their own learning partners rather than having teachers assign them" (Prensky, 2005/2006, p. 3). According to the Partnership for 21st Century Skills (2009), students should have the opportunity to "work effectively and respectfully with diverse teams" and "assume shared responsibility for collaborative work" (p. 4). Students may utilize and practice their collaboration skills through the use of web tools such as Google Docs™ to write collaboratively with others, often outside of school. In fact, "51 percent of students in grades 6-8 and 44 percent of students in grades 9-12 say that working with other students

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on projects is the best way for them to learn" (Project Tomorrow, 2011, p. 9). Students who are exposed to opportunities to work collaboratively with others will benefit in their chosen career or job.

Creativity

Creativity is the final key component of 21st century learning. Creativity includes curiosity, imagination, discovery, being inquisitive, and thinking "outside the box." Wagner (2008) stresses the need to "allow...students to ask why, not just tell them how" (p. 75). "New developments on the web are giving young people a set of experiences that create a hunger for more than merely learning through discovery...opportunities to exercise one's passion to create" (p. 181). Technology can provide another dimension for students to be creative.

21st Century Learning With Technology

The focus of 21st century learning is on sound teaching and learning practices. But, sometimes learning with technology becomes synonymous with 21st century learning. This section explores how technology should be seamlessly and naturally integrated into education.

Even before the start of the 21st century, educators were foreshadowing the potential role technology would play in education. In 1997, the National Council for Accreditation of Teacher Education indicated, "There is no longer a question about whether the new technology will be used in schools. Nearly everyone agrees that students must have access to computers...in the classroom" (p. 9). Classroom teachers have the opportunity to use technology to improve learning, but "if teachers don't understand how to employ technology effectively to promote student learning, the

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billions of dollars being invested in educational technology initiatives will be wasted"

(National Council for Accreditation of Teacher Education, 1997, p. 8). Soon after, in

1998, Tapscott reaffirmed

> [the] use of technology does not inhibit learning about math, science, reading, and
>
> writing. The opposite is true. The research to date shows that when appropriately
>
> integrated into a curriculum, the new media improves student performance, not to
>
> mention motivation, collaboration, and communication skills. (p. 136)

Now, fast forward to the present, over 10 years into the 21st century.

After a decade into the 21st century, the definition and understanding of a 21st

century learner continues to evolve. The U.S. Department of Education, Office of

Educational Technology (2010) poses the question, "What does it mean to be digitally

literate in an age of constantly evolving technologies and resources, and how we can

teach learners to use new technology in ways that are productive, creative, and

responsible" (p. 13)? To answer the question, education experts generally agree, across

all curriculum areas, "21st-century competencies and expertise such as critical thinking,

complex problem solving, collaboration, and multimedia communication should be

woven into all content areas" (p. 13). Educators continue to be challenged to gain an

understanding of the appropriate amount and types of technologies to integrate in order to

make a significant difference in student learning.

The integration of technology into 21st century learning environments continues

to evolve. One way is one-to-one initiatives or

> the leveraging of small, portable devices to facilitate anytime, anywhere,
>
> un-tethered learning. The proliferation of a wide range of mobile devices in

students' pockets and backpacks has also been a catalyst for this new interest area

within education circles. (Project Tomorrow, 2011, p. 4)

Students with access to a personal learning device, both in and out of school, have

educational opportunities not previously realized in education. One-to-one initiatives

will be explored in a later section.

Another way in which 21st century learning may be advanced through the use of

technology is by using online textbooks. According to Loewen (1995), traditional history

textbooks "encourage students to believe that history is facts to be learned" (p. 16) and

tell stories which are predictable as "every problem has been solved or is about to be

solved" (p. 13). But, Baker (2010) discusses the evolution of textbooks to online

textbooks:

> In the 21st century, "texts" and "literacy" are not limited to words on the page:
>
> they also apply to still and moving images, such a photographs, television, and
>
> film. Today, being literate also means understanding wikis, blogs, nings, digital
>
> media, and other new and emerging technologies. Unfortunately, many K-12
>
> educators have yet to realize the benefits of teaching students with and about
>
> non-print media, what is today recognized as an important part of "media
>
> literacy." (p. 133)

In a 2009 Speak Up survey, students were told that if they could design the ultimate

online textbook, what would it include? The students responded and

> focused on three key themes for their desired features and functionality:
>
> interactivity and relevancy of content, fostering collaborative learning and
>
> personalizing the learning process. This new online textbook desired by the

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students is not a CD of the printed textbook, nor is it digital reader. Rather, the

students are looking for a learning tool that mirrors the way they are currently

using a wide range of Web 2.0 tools and applications in their out-of-school lives.

(Project Tomorrow, 2010, p. 21)

Through the students' responses, themes of engagement, productivity, and learning all

emerged.

Unfortunately, students are waiting for educators and educational institutions to

understand how they learn and want to learn in today's digital society.

Whereas students will concede that incorporating technology into learning does

increase student engagement and motivation for learning, it is equally important

to realize that for today's students emerging technologies such as games and

online textbooks increase their personal productivity as well. Using technology as

part of learning is an essential business practice for today's students, not just an

add-on for skill development or motivation. (Project Tomorrow, 2010, p. 24)

Considering and then implementing the many components of learning, in conjunction

with technology, may allow K-12 education to establish learning environments

specifically designed for today's learners.

Social Studies Curriculum and Instruction

The National Council for the Social Studies (2010), the largest professional

association for social studies educators in the world, defines social studies as

the integrated study of the social sciences and humanities to promote civic

competence. Within the school program, social studies provides coordinated,

systematic study drawing upon such disciplines as anthropology, archaeology,

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economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences. The primary purpose of social studies is to help young people make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world. (p. 9)

For a variety of reasons, "the last decade of the twentieth century and the first decade of the twenty-first have seen a marginalization of social studies curriculum, instruction, and assessment at all grade levels" (National Council for the Social Studies, 2008, para. 1). When asked to list their favorite high school subjects, students usually list history last. "Students consider history 'the most irrelevant' of twenty-one subjects commonly taught in high school" (Loewen, 1995, p. 12). So, in an effort to move away from the tradition, perceptions, and reality of social studies instruction focusing on learning facts, important dates, geographic names, and government individuals (Rice & Wilson, 1999, p. 29), the National Council for the Social Studies released a position statement in 2008 titled *A Vision of Powerful Teaching and Learning in the Social Studies: Building Social Understanding and Civic Efficacy*. The vision outlined the qualities of good social studies teaching and learning: meaningful, integrative, value-based, challenging, and active.

Social studies teaching and learning are powerful when they are meaningful. Meaningful social studies builds curriculum networks of knowledge, skills, beliefs, and attitudes that are structured around enduring understandings, essential questions, important ideas, and goals....Breadth is important, but deep and

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thoughtful understanding is essential…information gathering and analysis, inquiry

and critical thinking, communication…and the prudent use of twenty-first century

media and technology. (National Council for the Social Studies, 2008, para. 7-9)

Social studies teaching and learning are powerful when they are integrative.

Integrative social studies

provides opportunities for students to conduct inquiry, develop and display data,

synthesize findings, and make judgments. Social studies teaching and learning

requires effective use of technology, communication, and reading/writing skills

that add important dimensions to students' learning. (National Council for the

Social Studies, 2008, para. 13-14)

Social studies teaching and learning are powerful when they are value-based.

Value-based social studies

[should be taught] from multiple perspectives. Students are made aware of

potential policy implications and taught to think critically and make decisions

about a variety of issues, modeling the choices they will make as adult citizens.

Students learn to assess the merits of competing arguments….Through

discussions, debates, the use of authentic documents, simulations, research, and

other occasions for critical thinking and decision making, students learn to apply

value-based reasoning when addressing problems and issues. (National Council

for the Social Studies, 2008, para. 17-19)

Social studies teaching and learning are powerful when they are

challenging. Challenging social studies instruction makes use of regular writing

and the analysis of various types of documents, such as primary and secondary

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sources, graphs, charts, and data banks…in-depth investigation…tools for inquiry.

(National Council for the Social Studies, 2008, para. 22-24).

Social studies teaching and learning are powerful when they are active.

Active lessons require students to process and think about what they are

learning.…Active learning is not just "hands-on," it is "minds-on." Students

work individually and collaboratively, using rich and varied sources, to reach

understandings, make decisions, discuss issues and solve problems. Students

construct meaning…opportunities to ask and answer questions, discuss or debate

implications, and participate in compelling projects that call for critical thinking.

Powerful social studies teachers develop and/or expand repertoires of engaging,

thoughtful teaching strategies for lessons that allow students to analyze content in

a variety of learning modes. (National Council for the Social Studies, 2008, para.

25-28)

The integration of technology in social studies may hold the potential to provide a more

powerful teaching and learning experience.

Social Studies Teaching and Learning With Technology

About 15 years ago, the discussion among educational scholars began to include

the potential use of technology in social studies curriculum. In 1996, Berson recognized

the fact that "the integration of computers into social studies is still in its infancy and

encompasses a dynamic process" (p. 496). Also in 1996, Hope summarized the state of

social studies education and highlighted the potential for technology in social studies

education:

Today I am haunted by the statements made by my college students as they reflect on their k-12 social studies experiences. The students invariably speak of their dislike for social studies, commenting that the teacher did not make it interesting, what was taught was irrelevant, it was taught by a coach who had other things on his mind, or the teacher sat behind the desk and told the students to read the chapter and answer the questions at the end. Being bombarded with these highly distressing comments on occasion after occasion is very upsetting to a teacher. If, however, that is the pedagogy those students experienced, it is no wonder that social studies is so routinely and soundly criticized. (p. 2)

Too many [social studies teachers] are yoked to the textbook, captive to chalk and talk, unable or unwilling to connect objectives with the real world....The teacher is the pivotal personality in the classroom, the one who can make things happen. How a teacher projects the content of a subject in the classroom is a determining factor in the subject's being liked or disliked by students and in students' diligent efforts to acquire the skills deemed important by the teacher. (p. 3)

Although other core subjects, such as English and mathematics, are moving toward student-centered, experiential, hands-on learning and constructivist learning strategies, the social studies remains subject-centered. Social studies, perhaps more than any other subject, needs to offer experiential learning to students. A contructivist approach...fits well into the social studies curriculum. (p. 4)

Technology is a promise waiting to be fulfilled by teachers bold enough to realize its potential and seize the opportunity to bring the world into the classroom. The Internet and other telecommunications options are resources that can contribute directly to transforming social studies teaching....Social studies teachers need to invest time in understanding the possibilities and potential of technology in the classroom and use technology to create a dynamic classroom, demonstrating for their students that the social studies classroom is an exciting place to be. (p. 4)

They will be creating a different and better learning environment in which to teach social studies by using technology to provide experiential learning. Social studies teachers need to integrate technology into their repertoire of skills so that they can bring an end to boring lessons, stimulate creativity, and exploit the need to be able to locate, identify, and use information in the new century. As part of their transformation process, social studies teachers will see the need for change to meet the challenges of a curriculum for the twenty-first century.
(pp. 4-5)

Hope's recognition of the past and present state of social studies teaching and learning also outlines the potential technology may hold to allow social studies learning to become more student-centered.

In 1997, Martorella referred to the integration of technology in social studies education as "a sleeping giant in the social studies curriculum" (p. 511) because of the untapped potential. Fontana (1997) echoed a same sense of urgency to include technology in the teaching and learning of social studies: "If social studies educators fail

to be on the forefront of technology, they risk having parents and policy makers conclude that the social studies are not relevant in the information age" (p. 6) and potentially convey "that…social studies are not as important as math and science" (p. 6). On the eve of the 21st century, social studies scholars advanced the idea of technology, and its potential, in a 21st century social studies classroom.

At the turn of the 21st century, Mason et al. (2000) initiated the dialog for an increase of technology in social studies education:

> Technology opens the door to learning social studies skills and content in ways impossible in the traditional classroom. The social studies teacher in today's classroom can use technology to extend learning opportunities for K-12 students. Teacher education faculty can most effectively take full advantage of technology by introducing students to activities in which skills and content are taught more actively and meaningfully. (p. 2)

Mason et al. went on to offer five principles as guides for the appropriate infusion of technology in social studies teacher preparation programs:

- Extend learning beyond what could be done without technology.

- Introduce technology in context.

- Include opportunities for students to study relationships among science, technology, and society.

- Foster the development of the skills, knowledge, and participation as good citizens in a democratic society.

- Contribute to the research and evaluation of social studies and technology.

    (p. 2)

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Mason et al.'s work would be later cited in the National Council for the Social Studies Position Statement in Technology in 2006.

Intrigued by Mason et al.'s work, "Guidelines for Using Technology to Prepare Social Studies Teachers," Crocco (2001) wrote a response to each of Mason et al.'s five principles in order to advance the use of technology in social studies education. Crocco states,

> The chief value of technology lies, therefore, in providing the leverage so urgently needed for moving social studies instruction away from passive, teacher-dominated approaches emphasizing recall and regurgitation toward active, student-centered forms of learning demanding critical and conceptual thinking from *all* students at *all* levels. As teacher educators in social studies, we need to promote the idea that technology facilitates new, more powerful forms of teaching and learning on a larger scale than was possible before. (p. 387)

> Unless we adopt and promote a powerful, research-based theory of learning on which our answers to these questions depend, we will miss an incredible opportunity to leverage technology for real change in social studies teacher education and, by extension, in our nation's schools. (p. 392)

More momentum for change was built upon within the same year.

Doolittle (2001) continued momentum for change through a response to both Mason et al. and Crocco:

> It is time within social studies education to take a long look backwards at the beliefs, assumptions, and theory underlying the domain, so that the look forward to practice and pedagogy is clear, informed, and valid. It is time to stop

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professing technological and pedagogical integration and to start integrating with

purpose and forethought. (p. 502)

The theory advanced by Doolittle provided a rationale for answering "why" when

promoting guidelines or suggestions for change (p. 503). Doolittle also incorporated

constructivism as a philosophical and theoretical foundation:

> Constructivism emphasizes the active role played by the individual learner in the
>
> construction of knowledge, the primacy of social and individual experience in the
>
> process of learning, and the realization that the knowledge attained by the learner
>
> may vary in its accuracy as a representation of an objective reality. The adoption
>
> of this theoretical foundation changes the nature of the social studies from one of
>
> a search for objective truth to one of a search for valid perspectives. (p. 509)

A summary of Doolittle's (2001) principles follows:

- [Active knowledge construction is an] emphasis on knowledge construction

  being an active process of social interaction and personal reflection and not a

  passive process of knowledge absorption.

    This active versus passive perspective leads to an emphasis on activity.

  This activity requires both social activity, as the source of knowledge and

  meaning construction, and individual mental activity, as the mechanism of

  remembrance.

    Students must be engaged in various forms of active discourse,

  provided the opportunity to reflect on their knowledge construction and,

  ultimately, to verbally express that constructed understanding. (p. 510)

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- [Organized knowledge construction] yields a personalized version of one's experience...knowledge construction results in perspectival knowledge, not factual knowledge.

  Within social studies the current shift from "history as fact" to "history as perspective" reflects the knowledge that history is interpretive, culturally subjective, and dynamic. Teachers and students need to become skilled in the interpretive nature of the social studies and deemphasize the memorization of dates, facts, and stories...teachers and students must begin to interpret events by actively examining the context of the event itself as well as their own context including personal and social biases, mores, and understandings.

  Interpretations require...a careful and critical evaluation of related primary sources. Thus, students must become skilled interpreters of both their own experiences and the experiences of others through self-reflection, critical analysis, and social interaction, in order to adequately organize these experiences. (p. 511)

- [Language-based knowledge construction reinforces the fact that teachers do] not serve to "transmit" knowledge between individuals but, serves as a stimulus to negotiation, action, and knowledge construction.

  Social studies teacher educators must disengage from the unidirectional telling of historical stories and begin to entrust preservice teachers with a discussion of the development of history.

  It is imperative to stress that dialogue does not imply simple discussing and telling, but rather, includes the analysis of ideas, the synthesis

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of verbal sources, the evaluation of the intersection of multiple sources, and

reflective explanation of one's own thoughts and understandings. (p. 512)

Much of Doolittle's work can be found integrated within the NCSS document *A Vision of*

Powerful Teaching and Learning in the Social Studies: Building Social Understanding

and Civic Efficacy.

In 2003, Whitworth and Berson completed an examination of the literature of

computer technology in social studies from 1996-2001. Their work provided a snapshot

in time summarizing technology in social studies:

Within the social studies, technology has served a dual role as an important

instructional tool that may have a significant effect on the global, political, social,

and economic functioning of American society. As both a method of instruction

and a topic of instruction, the impact of computers and technology on social

studies is immense. However, the extent to which this potential is being fully

realized in the social studies classroom has not been sufficiently explored.

Technology-based learning has the potential to facilitate development of students'

decision-making and problem solving skills, data processing skills, and

communication capabilities. Through the computer, students may gain access to

expansive knowledge links and broaden their exposure to diverse people and

perspectives; hence, affording students the opportunity to become active

participants in an increasingly global and interactive world. (p. 472)

Whitworth and Berson's conclusion continued the dialog calling for more research on the

use of technology in social studies classrooms.

Up to 2006, the dialog pertaining to technology as an integral component of social studies education was limited, but 2006 marked an increase in academic literature regarding the potential. Lee and Hicks (2006) called for more research to "[examine] how technology influences student learning" (p. 414) and "improve social studies educators' understanding of how the knowledge base and subsequent activities of teachers with regard to using digital technologies in social studies classrooms develop" (p. 415). Also highlighting the need for more research, Lee, Doolittle, and Hicks (2006) noted the limited research examining the use of primary and secondary digital sources, accessed through the Internet, as opposed to using traditional or non-digital sources (p. 291). They concluded, "Neither digital nor non-digital historical primary sources will have a major impact in the social studies or history classroom until teachers make more active use of the sources themselves" (Lee et al., 2006, p. 299).

Also in 2006, Hicks authored an article with Friedman to acknowledge that "at the moment we can easily be criticized as being a field that is 'research light,' which is not a strong place to be with calls for scientifically based research" (Friedman & Hicks, 2006, p. 251). Friedman and Hicks called for the need to

> engage in dialogues that examine where we have been with regard to research and development in the social studies; re-conceptualize the debate regarding technology integration and educational change; examine how the contextual constraints and realities of schooling serve to influence how teachers and students are using technology in the classroom; and develop, describe, and carefully research products and processes that use technology-enhanced instructional

strategies to support teacher needs and scaffold student learning within and across

the social studies disciplines. (p. 252)

The authors recognized the enormity of the complex process, but being necessary within

the social studies field to change the perspectives of teaching social studies through the

encouragement and promotion of "ongoing sophisticated and systematic research, as well

as recognizing the interconnectedness of different types of innovations and research

within the sprawling and evolving field of the social studies" (Friedman & Hicks, 2006,

p. 254).

Also in 2006, the National Council for the Social Studies revealed its *Technology Position Statement and Guidelines*:

> Imagine moving from this digitally connected environment to what for many
>
> seems like the lifeless and adult-centered world known as a classroom, where
>
> learning means spending time gathering information by reading a book! In an age
>
> of standards and accountability, teachers need to include the realities of students'
>
> lives, technology use in students' everyday lives, and the role and use of
>
> technology when planning…instruction….We need to capitalize on many
>
> students' ubiquitous, yet social, use of such technology and demonstrate the
>
> technology's power as a tool for learning (para. 7)…[and]…emphasize the links
>
> between the use of technology as a teaching and learning tool and the effects of
>
> the relation between technology and society. (para. 14)

The work of Mason et al. (2000) was a key component to the NCSS's technology

position statement.

In 2007, Friedman and Heafner utilized a quasi-experimental design to study a teacher teaching one 11th grade U.S. history class using the same pedagogical methods she normally would and one class using the computer lab engaging in inquiry learning throughout the unit. At the end of the unit, both classes were given the same test. The results indicated the scores for computer lab students were lower (pp. 201-202). The students who learned the unit in the computer lab appreciated the teacher's break from traditional pedagogical approach because they enjoyed the project, had a chance to be creative, were able to go at their own pace, were required to think, and did not get bored (p. 205). But, the skeptics wondered if the students learned through the use of technology or not. Friedman and Heafner (2007) pointed out the importance to not

> ignore the motivational benefits of having students engaged with the task as well as content, as the latter is foundational to improving student historical understanding....Students have to be trained to think independently before the benefits of inquiry learning can be maximized. (p. 208)

> Comparisons between student achievement and enjoyment suggest that enjoyment did not translate into higher academic achievement. Motivation for engaging with a task should positively affect student learning. (p. 209)

In 2008, Friedman and Heafner again concluded technology and the Internet was not having the desired impact on social studies. "Despite its potential for transforming social studies instruction and learning, the Internet has not had the impact many envisioned. Rather, social studies researchers recently argued...a lack of evidence exists in terms of technology's impact on student learning" (p. 82).

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Also in 2007, Zhao's research reinforced the premise that social studies textbooks were considered boring in contrast to more current and interesting information on the Internet (p. 318). Social studies teachers, according to Zhao, "realized that the traditional classroom, dominated by textbooks, worksheets, and teacher lectures, no longer satisfied the students who grew up with technology. These students are more motivated to learn from a variety of instructional strategies, especially when technology is involved" (p. 319). Zhao's study concluded, through the use of technology in a social studies classroom, students became "more motivated to explore information or complete assignments using computers" (p. 320) in addition to the role of the teacher shifting from being a knowledge dispenser to that of a guide (p. 323). According to Zhao, technology has the potential to engage students to play a more active role in learning social studies.

In 2009, the National Council for the Social Studies released a position statement on media literacy. The document acknowledges social studies information is rapidly moving from print sources to more digital sources. The NCSS recognizes students are constantly and digitally connected outside of the classroom, but are expected to disengage from the digital world within the classroom. If social studies teachers want to make learning relevant and meaningful for their students, they need to facilitate learning through digital world resources (para. 4). In other words, "the better we can prepare our students to critically question the information and media they are seeing, hearing, and using, the more likely they are to make informed decisions and to participate as citizens who can shape democracy for the public good" (para. 16).

Most recently, in 2010, Frye, Trathen, and Koppenhaver concurred with many researchers regarding the benefits of using technology in social studies:

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The Internet expands easy access to resources where students can find

information about relevant topics. Tools such as Google Maps and Google Earth

provide a means for students to learn geography in ways that are more exciting

and memorable because of their immediacy, quality, and flexibility in addressing

personal questions. PowerPoint, blogging software, and podcasting are three

tools that allow for easy public display of learned information. These tools

expand the possibilities for learning activities in the social studies classroom and

at the same time require teachers to structure lessons so they can meaningfully

harness these abundant resources. (p. 53)

Also in 2010, Shriner et al. stressed the importance of technology in social studies "as

instructional tools to promote student engagement in a meaningful learning environment"

(p. 39). The authors' goal was to have social studies instruction contain "a variety of

technological resources and hands-on activities designed to make social studies

instruction exciting, interesting, and fun for all students in the classroom" (p. 39).

While much of the research over the past 15 years highlighted the benefits of

integrating technology into social studies instruction, discussion about teacher pedagogy

was often missing. Does the integration of technology lead to teachers becoming more

constructivist or student-centered?

Constructivism: Teaching and Learning in Relation to Social Studies and Technology

The definitions and review of the literature on technology, constructivism, and

social studies have been explored. So, considering all three, what connections exist in

relation to teaching and learning?

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"Traditionally, [social studies] teachers have been thought of as conveyers of knowledge – the teacher teaches and the student learns" (Doolittle & Hicks, 2003, p. 12). In contrast to traditional methods, constructivism promotes learning by doing, active versus passive learning, and cooperative learning (Rice & Wilson, 1999, p. 30). Students like to discover things on their own, and thus, learning becomes more meaningful (Tapscott, 1998, p. 144). The "constructivist trends in education have increased social studies educators' awareness of the effectiveness of curriculum that engages students in learning-by-doing, problem solving, and decision making" (Fontana, 1997, p. 1). In this student-centered approach, students want to "*do* history, not just hear someone talk about history" (Ramaley & Zia, 2005, p. 8.17). Technology then may add a potential constructivist connection to how students learn and want to learn social studies.

Cuban (2001) suggests, "Computers offer ways of motivating students to learn about subjects they would seldom engage otherwise and to come to grips with real-world issues" (p. 15). Social studies teachers have "unbounded access to electronic images and texts that open up the full range of historical inquiry, analysis, and interpretation, as well as access to contemporary material" (Ramaley & Zia, 2005, p. 8.17). They also have the opportunity to enhance their own constructivist teaching practices through the use of technology (Rice & Wilson, 1999, p. 30). According to Doolittle and Hicks (2003),

> technology in social studies should be used primarily to foster academic independence and the ability to think and act. Social studies students must develop the ability to use technology as a tool in the pursuit of large, meaningful questions, providing resources, stimulating thought, challenging ideas, and fostering understanding. (p. 18)

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About the turn of the 21st century, studies concluded technology may lead to more constructivist teaching practices (Rakes, Flowers, Casey, & Santana, 1999, p. 11; Rice & Wilson, 1999, p. 29; ROCKMAN ET AL, 2000, p. 7). But, simply adding technology to a social studies curriculum does not automatically yield positive or even constructivist results.

Doolittle and Hicks (2003) provided a cautionary statement as to not assume technology itself will advance constructivist teaching practices in social studies:

The use of technology in social studies needs to be grounded philosophically, theoretically, and pedagogically. A grounded framework for implementing technology in social studies is necessary for advancing the domain of social studies beyond vacuous memorization into a realm of active inquiry, perspective taking, and meaning making designed to develop a deeper, more robust, and relevant understanding of social studies. (pp. 21-22)

Windschitl and Sahl (2002) acknowledged research, up to 2002, had favorably portrayed the connection between the use of technology and the advancement toward constructivist pedagogy (p. 169). But, Windschitl and Sahl found "pervasive portable technology did not initiate teachers' movement toward constructivist instruction" (p. 201). Similarly, Becker and Ravitz (1999) found "the relationship between technology use and pedagogical change…[to be] truly causal and not the mere conjunction of innovative teachers who happen to both use technology and develop a more constructivist pedagogy" (p. 381). The introduction of technology in educational environments would need additional research to determine the impact of technology and ubiquitous computing on social studies instruction.

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Ubiquitous Computing Initiatives

Ubiquitous computing initiatives provide students and staff in a school setting access to technology devices everywhere and at all times. School districts embarking on technology initiatives most often do so according to two principles: (a) financial resources and (b) defining the goals and outcomes. Throughout the 1980s and 1990s, computers were placed in computer labs. Over the past decade, technology has been introduced into the classrooms and even made available to each student in order to increase access. The "rapid technological advances have sparked interest in utilizing laptops as an instructional tool to improve student learning" (Gulek & Demirtas, 2005, p. 4). Regardless of how each district defines the technology initiatives, the underlying theme is to provide students with an increased access to technology. "Common to most initiatives is the idea that all students have individual access to computers, but program managers have different policies about, for instance, whether students can take computers home and about whether students lease or pay to own their computers" (Penuel, 2006, p. 330). Penuel defines the characteristics of one-to-one computing initiatives:

(1) providing students with use of portable laptop computers loaded with contemporary productivity software (e.g., word processing tools, spreadsheet tools, etc.),

(2) enabling students to access the Internet through schools' wireless networks,

(3) a focus on using laptops to help complete academic tasks such as homework assignments, tests, and presentations. (p. 331)

One form of ubiquitous computing is a classroom set of personal learning devices, such as laptop or netbook computers, in which each student has access within the classroom

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where the devices are located, but do not have the opportunity to take the devices home. Another form of ubiquitous computing provides each student with a personal learning device, such as a laptop or netbook computer, which they use in each class and have the opportunity to take home.

"Since the mid-1990s, schools have been implementing programs to bring portable technology into the classroom, primarily through the use of laptop computers" (Mouza, 2006, p. 488). Bebell and Kay (2010) further explain the impact of the laptop computer in K-12 education:

> Few modern educational initiatives have been as widespread, dramatic, and costly as the integration of computer technologies into American classrooms. Believing that increased use of computers will lead to improved teaching and learning, greater efficiency, and the development of important skills in students, educational leaders have made multi-billion dollar investments in educational technologies. (p. 5)

The one-to-one trend in education continues to gain even more momentum for a variety of reasons. "The decreasing costs, combined with the lighter weight of laptops and increasing availability of wireless connectivity, are all making such initiatives more feasible to implement on a broad scale" (Penuel, 2006, p. 329). As one-to-one computing holds great potential, it also holds the potential to be a disruptive force in education, positive or negative. Each curriculum area has conducted a variety of studies in conjunction with one-to-one computing.

With the historical nature of textbook and lecture instruction of social studies curriculum, "it becomes imperative for social studies educators to engage in dialogue

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over how ubiquitous computing models can enrich teaching and learning in the social studies classroom" (van Hover, Berson, Bolick, & Swan, 2006, p. 278); van Hover et al. continued on to highlight the importance of technology in social studies:

> Ubiquitous computing has enormous implications for social studies pedagogy, and consequently, teachers will need to transform traditional approaches to curriculum to exercise their full potential. For example, teachers will become facilitators of knowledge, helping students construct meaning from the multitude of perspectives that the World Wide Web introduces. (p. 279)

But, van Hover et al. stressed the importance of establishing a clear vision of what social studies education and student learning will look like and what might potentially be different with one-to-one technology (p. 278). According to the authors, research and pilot studies will be necessary to make informed decisions about technology in social studies.

In 2002, Maine embarked on the first statewide education technology initiative in the United States which was designed to "transform Maine into the premier state for utilizing technology in kindergarten to grade 12 education in order to prepare students for a future economy that will rely heavily on technology and innovation" (Silvernail & Lane, 2004, p. 1). The primary researchers, Silvernail and Lane, outlined the Maine Learning Technology Initiative (MLTI); "the initial phase of the MLTI (2002-2004) provided all 7th and 8th grade students and their teachers with laptop computers, and provided schools and teachers [with] technical assistance and professional development for integrating laptop technology into their curriculum and instruction" (p. 1). The summary after two years indicated "the laptop program…[had] been very successful to

date, helping schools to integrate the laptop technology into their classrooms and the

learning process. And there…[was] substantial self-reported evidence that student

learning…[had] increased and improved" (p. 34). In addition, teachers reported moving

> away from direct instruction to the role of "facilitator" or "coach"; increased use
>
> of inquiry approach as opposed to memorization and practice; increased use of
>
> interdisciplinary or integrated approaches; increased use of cooperative or
>
> collaborative structures for learning; and increased use of differentiated or
>
> individualized learning tasks. (Fairman, 2004, p. 15)

Although the MLTI reported favorable results, the conclusion also indicated a need for

further study.

In 2003, the Texas Legislature created and financially supported the Technology

Immersion Pilot, also known as TIP. Their premise "assumed that the use of technology

in Texas public schools could be achieved more effectively by 'immersing' schools in

technology rather than by introducing technology resources in a cyclical fashion over

time" (Shapley, Sheehan, Maloney, & Caranikas-Walker, 2010, p. 5). Shapley et al.

oversaw the research study, using a quasi-experimental research design that "included

comparisons between 21 treatment schools and 21 control schools that enrolled Grades 6

to 8 students" (p. 5). Participating schools were part of a four-year evaluation study

comparing pilot and control classrooms. Throughout the study, participants perceived

TIP was benefitting students "because one-to-one student laptops and digital resources

had increased the depth of learning across subject areas, exposed students to more

real-life experiences, and allowed students to demonstrate greater responsibility" (p. 46).

But, by the fourth year, Shapley et al. (2009) discovered "students' access to and use of

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laptops for learning within and outside of school continued to fall well short of expectations" (p. 88) and "there was no evidence linking Technology Immersion with student self-directed learning or their general satisfaction with schoolwork" (p. 83).

In 2005, Massachusetts embarked on a 1:1 pilot study called Berkshire Wireless Learning Initiative (BWLI). The study

> was a three-year pilot program across five western Massachusetts middle schools where every student and teacher was provided a laptop computer beginning in 2005....[A]ll classrooms were equipped with wireless Internet networks...as well as technical and curricular professional development and support to help teachers integrate the new technology into their curriculum....[T]he initiative continued through the 2007-2008 academic year.
>
> The overall aim of the pilot program was to determine the efficacy of a one-to-one laptop initiative in transforming teaching and learning....[T]he targeted outcomes of the BWLI included: enhancing student achievement, improving student engagement, improving classroom management, enhancing students' capabilities to conduct independent research and collaborate with their peers, as well as creating fundamental changes in teaching strategies and curriculum delivery. The research efforts employed a pre/post with comparison group design to examine the effects of 1:1 technology on students and teachers across the five participating schools. In addition to following the cohorts of students over three years of the 1:1 technology implementation, the researchers also collected comparison data from two neighboring public middle schools with similar demographics. (Bebell & Kay, 2010, pp. 7-8)

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Bebell and Kay's (2010) conclusions included strong evidence that student engagement, motivation, collaboration, and interaction all increased dramatically (pp. 21, 25). Regarding teachers, Bebell and Kay were interested in "the way teachers transformed their teaching practices to accommodate technology and how these changes enhanced student engagement and learning" (p. 47). Both teaching and learning changed because of the BWLI.

In contrast, research has also proven 1:1 initiatives and computers in general have not lived up to the promise and potential. While advocates of 1:1 computing "believe that educationally beneficial uses of computers will emerge spontaneously from the deployments of laptop computers in ratios of one computer per user" (Weston & Bain, 2010, p. 10), studies have proven otherwise. Shapley et al.'s (2010) research found "students' access to and use of laptops for learning within and outside of school continued to fall well short of expectations in the fourth year" (p. 45). In some studies, the impact on both teaching and learning yielded lower than anticipated results.

Does the integration of technology enable teachers to adopt more constructivist teaching practices? Cuban's (2001) study found the majority of teachers employed technology in their classroom "to sustain existing patterns of teaching" (p. 134). Similarly, Windschitl and Sahl (2002) concluded "portable technology did not initiate teachers' movement toward constructivist instruction. The availability of technology was neither a necessary nor a sufficient condition to affect pedagogy" (p. 201). Rice and Wilson (1999) also concluded "technology itself, especially if it is coupled with traditional teaching methods, will not accomplish many of the changes" (p. 32).

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According to some studies, the impact of technology on teaching practices needs further research and understanding.

Does the integration of technology increase academic achievement? Cuban's (2001) study "found no clear and substantial evidence of students increasing their academic achievement as a result of using information technologies" (p. 133). Friedman and Heafner's (2007) study investigated effects of student engagement in inquiry learning environments through the development of websites. Neither the enjoyment of the project perception of the students nor high achievement on the finished product of creating a website translated into high scores on the unit test (p. 199). In the study, "students who were engaged in inquiry learning scored lower on the standards-driven unit test than their counterparts who received traditional instruction" (Friedman & Heafner, 2007, p. 207). In addition, Silvernail and Lane's (2004) 1:1 study in Maine discovered overall performance on the 8th grade MEA has not changed since the inception of MLTI (p. 4). According to some studies, the impact of technology on student academic achievement also needs further research and understanding.

Taking into consideration both positives and negatives of 1:1 initiatives, Bebell and O'Dwyer (2010) predicted a high likelihood of 1:1 computing in the majority of American classrooms in the near future. How long the reform process takes remains to be seen, but will depend on policy makers, leadership, and financial resources (pp. 12-13). But, as is true for most educational reforms, including technology in educational environments, "there is substantially more interest and opinion concerning the idea, than actual research-based facts on the subject" (Bebell & O'Dwyer, 2010, pp. 12-13), but recognize the fact that information from studies on 1:1 computing is still

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limited. "The potential attractiveness of...[1:1] programs must be weighed against their considerable cost. For this reason, educational administrators and policy-makers are anxiously awaiting evidence of the benefits of one-to-one laptop programs for teaching and learning" (Grimes & Warschauer, 2008, p. 307). So, Bebell and O'Dwyer (2010) called on scholarly reflection and sharing to learn more about 1:1 computing as a key component of education (p. 13). Although the "educational technology research community's collective knowledge about one-to-one initiatives has not...kept up with the rapid expansion of these initiatives" (Penuel, 2006, p. 329), "it is easy to conclude that the potential of 1:1 student and teacher computing holds major promises for transforming teaching and learning" (Bebell & Kay, 2010, p. 54).

<center>Summary</center>

The interplay among four basic themes exists in this study: teaching, learning, technology, and social studies. In general, current research indicates teachers should discover ways to incorporate technology into their social studies curriculum in order to meet the needs of all students. To varying degrees, the integration of technology in social studies continues to evolve. It is the impact of the integration of technology in social studies classrooms that constitutes the depth and breadth of this study.

This study investigated the overall impact of a pilot netbook initiative in five social studies classrooms. The following chapter will present the description of the instrument and methodology utilized in this study's data collection process.

<center>65</center>

CHAPTER III

METHODOLOGY

The purpose of this study was to ascertain the impact of a one-to-one netbook initiative on learning in five social studies classrooms. Quantitative and qualitative data were collected and analyzed to determine the overall impact. The scope of the study included five teachers and their students utilizing a classroom set of netbook computers as an integral component of the social studies curriculum. Chapter III presents the procedures used in this study, including a brief history of the pilot project, participant selection, design of the research plan, data collection instruments, collection of data, data analysis, reliability and verification of qualitative data, and summary.

Brief History of the Pilot Project

The netbook pilot project was initiated through the Grand Forks Public Schools (GFPS) Social Studies Steering Committee (SSSC) curriculum work in the spring of 2010 and led by the researcher. Questions pondered by the SSSC were (a) can social studies instruction and learning be reformed with the introduction of laptop computers in a classroom, (b) what would the impact be on learning if teachers incorporated more technology into their social studies curriculum, and (c) what can social studies teachers do to generate more enthusiasm for social studies curriculum and make the curriculum more interesting and applicable? In order to discover answers to the questions, the netbook pilot project was initiated.

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On June 15, 2010, the social studies laptop pilot was proposed at a GFPS SSSC meeting (Appendix A) and on June 16, 2010, Dr. Terry Brenner, GFPS Curriculum Director, provided his support to the pilot study (Appendix B). The official approval for the GFPS SSSC to proceed with the pilot and research study was granted by Mr. Jody Thompson, GFPS Assistant Superintendent for Teaching and Learning (Appendix C).

The scope of the netbook pilot was determined based on GFPS budgetary constraints. The netbooks were chosen based on cost and familiarity by the technology department. The technology department implemented the same netbooks in other areas of the district, which would allow for consistent technical knowledge and software use. In order to have both middle school and high school teachers participate in the pilot, the initial scope of the pilot was set at two middle school and two high school teachers to pilot the netbooks. Based on the funding in conjunction with the lower number of students in the potential pilot classrooms, the scope of the pilot was later changed by the GFPS SSSC to have three middle school and two high school teachers pilot the netbooks.

The purpose of the netbook pilot was to gain a better understanding of the learning, engagement, and perception of students learning social studies through the use of a netbook computer. The GFPS SSSC extended the opportunity to all 33 GFPS middle and high school social studies teachers through an application process (Appendix D). The netbook pilot provided the opportunity for all middle and high school social studies teachers to consider applying to pilot a classroom set of netbooks as a tool for student learning in their social studies classroom.

Interested teachers submitted a one to two page proposal to include their interest in the netbook pilot and initial thoughts on how students' learning would be enhanced

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through the use of the netbook computers. Articulation of 21st Century Learning, National Council for the Social Studies position statement on Media Literacy, and National Education Technology Standards were also critical components of the application. At the conclusion of the application process, the pilot teachers were chosen by the GFPS SSSC based on the criteria set forth in the correspondence to solicit applicants (Appendix D).

Once the pilot teachers were chosen and the netbooks arrived, the teachers selected to pilot the netbooks received training. One and a half professional development days were dedicated to training the netbook pilot teachers. The training was provided by GFPS technology staff and included an overview of the software, operating systems, connecting to the wireless Internet, online textbooks, Google Docs™, and other web-based resources.

The pilot teachers understood the GFPS SSSC would be gathering data through surveys, teacher and student responses to open-ended questions, and classroom observations in order to determine the impact of the netbooks.

Participant Selection

The GFPS SSSC determined two groups would be used for the research study: a pilot group and a control group. Three middle school and two high school teachers were selected to pilot a classroom set of netbook computers. After the netbook pilot teachers were chosen, the students in the pilot teachers' classes became the treatment or pilot group. The number of students participating in the pilot group totaled 403 at the onset. See Table 1 for specific details pertaining to the pilot group.

Table 1. Number of Students and Participating Teachers in the Netbook Pilot Group.

Grade	Subject	School	Teacher	Students
7th	World Geography	South Middle School	A	74
8th	U.S. history	South Middle School	B	76
8th	U.S. history	Schroeder Middle School	C	73
11th	U.S. history	Red River High School	D	83
12th	Economics	Central High School	E	97
Total				403

Based on the selection of the pilot teachers' curriculum area/class and grade level, teachers of the same curriculum area/class and grade level within GFPS were solicited to have their students participate as the control group. The control classrooms were chosen to understand perceptions of learning social studies in traditional ways, including, but not limited to, textbook, lecture, discussion, and notes in comparison to pilot classrooms. The control group for this study consisted of students in three middle school and two high school social studies classes. No students in the control group were provided with netbooks on a daily basis at school. The number of students participating in the control group totaled 367 at the onset. See Table 2 for specific details pertaining to the control group.

Design of the Research Plan

The design of the research plan was determined through the process used by the GFPS SSSC. First, a pre-experimental design, one group pre- post-survey, was used with

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Table 2. Number of Students and Participating Teachers in the Non-Netbook Control Group.

Grade	Subject	School	Teacher	Students
7th	World Geography	Valley Middle School	F	48
8th	U.S. history	Schroeder Middle School	G	79
8th	U.S. history	Valley Middle School	H	59
11th	U.S. history	Central High School	I	78
12th	Economics	Red River High School	J	103
Total				367

the groups who were introduced to netbook computers in place of their traditional textbook. The group was measured with a pre-survey on their perceptions toward social studies instruction before using the netbooks as an integral component of their social studies curriculum. The use of the netbooks included, but was not limited to, note taking, Internet researches, online textbooks, web tools such as Google Docs™, and writing. Following a semester of using a netbook computer in place of a textbook, the students' perceptions were measured in a post-survey. The researcher analyzed the quantitative descriptive statistics of the pre-survey and post-survey scores.

Second, a quasi-experimental design, pre- post-survey non-equivalent group design, was used. Because the selection of the pilot and control groups was not truly random and because it is simply not possible for educational researchers to undertake true experiments in a laboratory setting, the study is a quasi-experiment (Cohen, Manion, &

Morison, 2007, p. 282). Comparisons were made between the two non-equivalent groups in this quasi or field experiment. Students in the pilot group used a netbook computer while the control group continued to use a textbook for social studies curriculum. A pre-survey and post-survey was administrated to both groups to determine potential differences in perceptions toward learning social studies through the two different methods.

In addition to the quantitative surveys, qualitative methods were used to bring depth and perspective to the research. Qualitative data included classroom observations, student responses to the open-ended question/statement, and teacher responses to open-ended questions and statements. The qualitative data were collected and later coded and categorized in order to understand the impact of the netbook pilot in greater depth. The qualitative component of the study provided "a unique example of real people in real situations, enabling readers to understand ideas more clearly" (Cohen, Manion, & Morrison, 2007, p. 253) and provided participants' perspectives not always evident through numerical analysis.

Data Collection Instruments

In order to determine the overall impact of a pilot netbook initiative, data from both quantitative and qualitative methods were collected by the researcher for the GFPS SSSC. The researcher, in cooperation with the GFPS SSSC, designed the survey instrument based on the criteria outlined in the approval to conduct research (Appendix C), GFPS Policy 2130 (Appendix E), and Family Educational Rights and Privacy Act (FERPA) (Appendix F). The theme was to develop an appropriate survey instrument in order to gather valuable data while protecting the privacy of teachers and students.

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The survey instrument used for the quantitative approach was a pre- and post-survey with both pilot and control groups. The survey instrument was designed by the researcher in Statistics II class during fall semester of 2010. The researcher's undergraduate major in social studies, along with reviewing numerous technology surveys, was used as a basis in designing the survey. Ideas for the survey questions and structure were adopted from a survey used in Maine's One-to-One Laptop Program (Silvernail & Lane, 2004). The survey was designed to gather student perception data of engagement, productivity, learning, and technology in the netbook pilot classrooms compared to the control classrooms. Engagement, productivity, learning, and technology were established by the researcher as the level II constructs. Individual survey questions were developed by the researcher, in cooperation with the GFPS SSSC, based on the information needed to determine the impact on student learners after the introduction of the netbook computers (Appendix G, Appendix I, and Appendix J).

Data gathered from the qualitative approach included classroom observations, student responses to open-ended questions, and teacher responses to open-ended questions. First, classroom observation data were collected through the use of field notes by the researcher. Second, the student response data were collected through an open-ended question/statement on the post-survey: "Please describe, in detail, both positive and negative aspects of using the netbooks in your social studies class this semester." Finally, the pilot teachers responded to open-ended questions and statements, at approximate one month intervals, throughout the semester (Appendix H). The open-ended questions and statements were developed by the researcher, in cooperation with the GFPS SSSC, based on the information needed to determine the impact on student

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learners after the introduction of the netbook computers. In general, the qualitative data collection instruments were designed to gather both student and teacher perception of engagement, productivity, learning, and technology in the netbook pilot classrooms compared to the control classrooms.

Collection of Data

The data collection was conducted in the following ways utilizing a mixed-methods approach. Quantitative data were collected by using the student survey (Appendix G, Appendix I, and Appendix J). Survey Monkey was used to administer the surveys and collect data. The teachers who applied for and were chosen to pilot the netbook computers agreed to have their students take the survey. In addition, five additional control teachers agreed to have their students take the survey. The teachers were provided the link to the survey and access to computers in order to facilitate the students taking the survey. The students were required to take the survey as part of the class.

The first section of the survey captured demographic data for grouping purposes, such as school, grade, and teacher. For example, because all students took the same survey, the teacher component question was used to separate the pilot students from the control students. The second section captured student perceptions of social studies engagement, productivity, learning, and technology. The third section sought to highlight current social studies teaching and learning practices while the final section focused on the current level of technology used in their social studies class. The constructs of engagement, productivity, learning, and technology were developed from current best practices in teaching and learning. The six point Likert scale developed, allowed each

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respondent to choose from a range of strongly disagree to strongly agree (Appendix G,

Appendix I, and Appendix J).

Qualitative data were collected through classroom observations and student and

teacher responses to open-ended questions and statements. The purpose of the classroom

observations, made known to the pilot teachers, was to determine the ways and degree to

which the netbooks were utilized in the social studies curriculum, not to evaluate the

teacher. In compliance with GFPS Policy 2130 (Appendix E), two observations of each

pilot classroom were conducted by the researcher during an agreed upon time with each

of the netbook pilot teachers. The observations were not conducted using guided topics,

but rather the observations were conducted through the collection of field notes taken by

the researcher on a laptop computer. The field notes were a written account of the

thoughts, sights, sounds, and experiences of the researcher (Bogdan & Biklen, 2007,

pp. 118-119). Student and teacher behaviors and interactions were observed, but the

researcher specifically focused on how students were utilizing the netbooks for social

studies. Upon the completion of all observations, the field notes were coded by the

researcher. Because the specific purpose of the observations was to determine the ways

and degree in which the netbooks were utilized in the social studies curriculum, the

control classrooms were not observed because the netbooks were not utilized. Also, the

researcher has been observing middle and high school social studies teachers/classes for

the past eight years, so the overarching teaching and learning components that take place

on a consistent basis in a non-netbook social studies setting were known.

Students in the pilot group responded to the open-ended question/statement on the

post survey: "Please describe, in detail, both positive and negative aspects of using the

netbooks in your social studies class this semester." The responses from Survey Monkey, or raw data, were downloaded onto a spreadsheet in preparation to be coded. Because of the specified nature of the question/statement on student use of netbooks, the same question/statement was not asked on the post-control survey.

The pilot teachers' responses to open-ended questions and statements throughout the pilot were collected through the use of email and Google Docs™. The responses were downloaded onto a spreadsheet to be coded and categorized. The questions were developed by the researcher based on the level II constructs of engagement, productivity, learning, and technology. In addition, questions were posed by the researcher, in cooperation with the GFPS SSSC, to gather perception and level of integration throughout the pilot (Appendix H).

Data Analysis

Employing a mixed-methods approach, the researcher analyzed the data in both a quantitative and qualitative manner. A statistical analysis of the quantitative data was conducted to determine perception changes, if any, among the students being introduced to the netbook computers. First, demographic data were gathered from the pre- and post-surveys. Second, reliability and internal consistency tests on the constructs were conducted from the pre- and post-surveys. Third, results for the pre-experimental design, one group pre-post-survey, for the pilot group were determined. Finally, with the quasi-experimental design, pre-post-survey non-equivalent group design, results were analyzed through the use of independent samples t tests and chi-square tests of independence.

Qualitatively, data were obtained from classroom observations, pilot student responses to an open-ended question/statement, and pilot teacher responses to

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open-ended questions/statements. The researcher used Lichtman's (2010, p. 197) terminology of codes, categories, and concepts to organize and analyze the classroom observation field notes, pilot student responses to the open-ended statement, and pilot teachers' responses to open-ended statements. The coding process, completed by the researcher, was the first step in analyzing the raw survey data and was used to sort and organize the data to "identify recurrent themes and concepts" (Lichtman, 2010, p. 243). Through the coding process, the researcher identified key words and phrases that either repeated and/or stood out (Bogdan & Biklen, 2007, p. 173) based on the constructs. The researcher used a spreadsheet to identify key words or phrases and to sort the words of students' written statements, teachers' written responses, and the researcher's observation field notes.

After the researcher completed the initial coding and later revisited the initial coding, some of the codes were later merged in order to remove any redundancies (Lichtman, 2010, p. 199). Bogdan and Biklen acknowledge some categories may be further identified by the researcher while collecting data (2007, p. 173), and, in this study, the codes emerged within the constructs and categories of engagement, productivity, learning, and technology. The concept map provides a detailed overview of the codes, categories/constructs, and concepts of the data (Appendix K).

Reliability and Verification of Data

While quantitative research results focus heavily on reliability, qualitative research focuses on the expectation that "there will be consistency in results of observation made by different researchers or by the same researcher over time" (Bogdan & Biklen, 2007, p. 39). Bogdan and Biklen continue, "Qualitative researchers

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tend to view reliability as a fit between what they record as data and what actually occurs in the setting under study" (p. 40). The accuracy and comprehensiveness of the data are essential in qualitative studies (Bogdan & Biklen, 2007, p. 40). So, in order to address the issue of reliability and validity, the researcher considered potential threats and developed a plan to ensure accurate results.

The role of the researcher is essential to the study because of the knowledge within the research situation (Lichtman, 2010, p. 224). The researcher's role in the study is described in Chapter I. The researcher's social studies academic background and experience in educational administration brought qualifications to the study. For example, throughout the classroom observations, the researcher's social studies background provided knowledge and insights into the research-based best practices. In addition, the researcher's educational administration education and experiences assisted in gathering observational data for the netbook pilot classroom settings. The researcher was also trained in qualitative research methods within doctoral coursework.

The researcher engaged in an extensive review of the literature pertaining to ubiquitous computing initiatives and the role of technology in social studies education. The literature review included current qualitative research studies pertaining to technology integration in K-12 schools. Also, field notes by the researcher were taken during classroom observations. All classroom observations included a system of coding, categories, and concepts identified to analyze and synthesize the field notes. Finally, the researcher's data were reviewed by two external reviewers who were not involved in the collection of the data, in order to provide independent and objective feedback. One was the chair of the committee and the second was Dr. Bill Siders, biologist in the Grand

Forks Human Nutrition Research Center and instructor of statistics. Their feedback provided confirmation and verification of the data and led to changes in order to accurately report the data.

Summary

Chapter III described procedures used in this study, including a brief history of the pilot project, participant selection, the design of the research plan, survey instrument, collection of data, and data analysis. In Chapter IV, the data will be presented according to each research question.

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CHAPTER IV

RESULTS

The study comprised of quantitative and qualitative approaches to gain an overall understanding of the netbook pilot and to answer the research questions:

1. What were students' perceptions of learning, engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

2. What were teachers' perceptions of learning, engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

3. What constructivist teaching practices emerged in a social studies curriculum environment with each student having access to a netbook computer?

The purpose of this study was to ascertain the impact of a one-to-one netbook initiative on learning in five social studies classrooms. Quantitative and qualitative data were collected and analyzed to determine the overall impact. This chapter contains the following sections:

- description of the research population
- reliability analysis of the survey
- one group pre-post-survey results
- pre-post-survey non-equivalent group design results

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- independent samples *t* tests

- chi-square tests of independence

- qualitative results

For the purposes of this study, statistical significance was set at the .05 level.

Research Population

The research population was identified by the GFPS Social Studies Steering Committee. On June 15, 2010, the social studies laptop pilot was proposed at a GFPS SSSC meeting (Appendix A) and on June 16, 2010, Dr. Terry Brenner, GFPS Curriculum Director, provided his support for the pilot study (Appendix B). The official approval for the GFPS SSSC for the pilot and research study was granted by Mr. Jody Thompson, GFPS Assistant Superintendent for Teaching and Learning (Appendix C). After receiving administrative approval, the GFPS SSSC invited all GFPS middle and high school social studies teachers to participate through an application process (Appendix D). In order to have both middle school and high school teachers participate in the pilot, the initial scope of the pilot was set with two middle school and two high school teacher classrooms to pilot the netbooks. The scope of the pilot was later changed by the GFPS SSSC to have three middle school teachers and two high school teachers pilot the netbooks. The GFPS SSSC determined two groups would be used for the research study: a pilot group and a control group. It was also determined pre- and post-surveys would be conducted with the pilot and control students.

As a component of the pre-survey, students were asked a variety of demographic and grouping questions. Participants of the pre-survey consisted of 770 Grand Forks Public Schools middle and high school students. The netbook pilot group consisted of

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403 students while 367 students from the control group completed the survey. Students from both pilot and control classrooms represented each of the following grade level and courses: 12th grade economics, 11th grade U.S. history, 8th grade U.S. history, and 7th grade geography. Demographic information is included in Table 3.

Table 3. Pre Pilot Demographic Information of Survey Sample (N=770).

	Count	%/Mean
School		
Schroeder Middle School	152	19.7
South Middle School	150	19.5
Valley Middle School	107	13.9
Central High School	175	22.7
Red River High School	186	24.2
Groups		
Netbook Pilot	403	52.3
Control	367	47.7
Grade Level		
7	122	15.8
8	287	37.3
11	158	20.5
12	203	26.4
Gender		
Male	366	47.5
Female	404	52.5
Computer With Internet Access at Home		
Yes	730	94.8
No	40	5.2
Grades Earned		
Mostly A's	330	42.9
Mostly B's	127	16.5
Mostly C's	25	3.2
Mostly D's	2	.3
Mostly A's and B's	181	23.5
Mostly B's and C's	90	11.7
Mostly C's and D's	15	1.9

At the conclusion of the netbook pilot, a post-survey was conducted consisting of 617 Grand Forks Public Schools middle and high school students. The netbook pilot consisted of 380 students while 237 students from the control group completed the survey. Students from both pilot and control classrooms represented each of the following grade level and courses: 12th grade economics, 11th grade U.S. history, 7th grade geography while 8th grade U.S. history was represented by students in two pilot classrooms. Students in the two 8th grade control classrooms did not take the post-survey. Demographic information is included in Table 4.

Three middle school teachers and two high school teachers were selected to pilot a classroom set of netbook computers. After the netbook pilot teachers were chosen, the students in the pilot teachers' classes became the treatment or pilot group. The number of pilot group students participating in the pre-survey totaled 403 while the number of students participating in the post-survey totaled 380. The differences in the pilot group pre- and post-survey participants occurred because students may have moved in or out of the district, been absent on the day of the survey, or been pulled out of class for a special assembly or extracurricular activities. See Table 5 for specific details pertaining to the pilot group.

As part of the study, control teachers were also chosen as a way to understand perceptions of learning social studies in traditional ways, including, but not limited to, textbook, lecture, discussion, and notes in comparison to pilot teachers. The control group for this study consisted of students in three middle school and two high school social studies classes. None of the students in the control group were provided with netbooks on a daily basis at school. The same classes, but within the district, were

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Table 4. Post Pilot Demographic Information of Survey Sample (N=617).

	Count	%/Mean
School		
Schroeder Middle School	72	12.0
South Middle School	158	26.0
Valley Middle School	48	8.0
Central High School	151	24.0
Red River High School	188	30.0
Groups		
Netbook Pilot	380	62.0
Control	237	38.0
Grade Level		
7	120	19.0
8	158	26.0
11	151	24.0
12	188	30.0
Gender		
Male	300	48.6
Female	317	51.3
Computer With Internet Access at Home		
Yes	571	93.0
No	46	7.0
Grades Earned		
Mostly A's	275	45.0
Mostly B's	106	17.0
Mostly C's	26	4.0
Mostly D's	5	.1
Mostly A's and B's	116	19.0
Mostly B's and C's	66	11.0
Mostly C's and D's	23	4.0

chosen to be surveyed as the control group. After the control group teachers were

chosen, the students in the control teachers' classes became the control group. The

number of students participating in the control group survey totaled 367 at the onset

while the number of students participating in the post-survey totaled 237. Control

teachers G and H did not have their students take the post-survey, which has been

identified as a limitation of the study. See Table 6 for specific details pertaining to the control group.

Table 5. Number of Pilot Students Participating in the Pre- and Post-Surveys.

Grade	Subject	School	Teacher	Students	Students
7th	World Geography	South Middle School	A	74	71
8th	U.S. history	South Middle School	B	76	87
8th	U.S. history	Schroeder Middle School	C	73	72
11th	U.S. history	Red River High School	D	83	78
12th	Economics	Central High School	E	97	72
Total				403	380

Table 6. Number of Control Students Participating in the Pre- and Post-Surveys.

Grade	Subject	School	Teacher	Students Pre	Students Post
7th	World Geography	Valley Middle School	F	48	48
8th	U.S. history	Schroeder Middle School	G	79	0
8th	U.S. history	Valley Middle School	H	59	0
11th	U.S. history	Central High School	I	78	73
12th	Economics	Red River High School	J	103	116
Total				367	237

Note: Control teachers G and H did not have their students take the post-survey which has been identified as a limitation of the study.

Near the end of the school year and conclusion of the netbook pilot, both pilot and control teachers were asked to provide access to the post-survey for their students to take. A two week advanced notice of the survey window was provided to both pilot and control teachers. Near the end of the survey window, two teachers were provided reminders for their students to complete the survey. One teacher cited the lack of access to computers for students to take the online survey while the other teacher had access to computers, but was unable to access the Internet. The end of the school year came with two of the five control teachers not having their students take the post-survey. This became a limitation of the study.

<center>Quantitative Results</center>

This section utilizes quantitative data in order to answer the research questions. The first section addresses the reliability and internal consistency of the survey data. Next, the results for the pre-experimental design, one group pre-post-survey, for the pilot group are presented. The final quantitative subsection presents the quasi-experimental design, pre-post-survey non-equivalent group design, results through the use of independent samples t tests and chi-square tests of independence.

Prior to investigating the potential differences between the pilot and control groups prior to the netbook treatment, the reliability coefficients and the correlation among the four constructs were determined. The Cronbach alpha measurement of reliability was used to provide a measure of internal consistency among items (Cohen et al., 2007, p. 148) within the constructs of engagement, productivity, learning, and technology. The Cronbach alpha scores in Table 7 indicate an overall acceptable to high rate of internal consistency, with the exception of learning (.63) which falls just below the

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Table 7. Pre-Survey Correlation of Subscale Constructs and Measures of Internal Consistency.

Construct Category	Question #	Engagement	Productivity	Learning	Cronbach Alpha
Engagement	Q1,Q2,Q3				.72
Productivity	Q5,Q6,Q7	.60			.85
Learning	Q9,Q10,Q11	.62	.45		.63
Technology	Q4,Q8,Q12	.22	.22	.28	.92

acceptable reliability coefficient of .70. Overall, it appears the questions in each construct are closely related as a group.

After the students completed the post-survey, the reliability coefficients and the correlation between the four constructs were checked again. The Cronbach alpha scores of .72 to .93 in Table 8 indicate an overall acceptable to mostly high rate of internal consistency because the scores are all above the acceptable reliability coefficient of .70.

Table 8. Post-Survey Correlation of Subscale Constructs and Measures of Internal Consistency.

Construct Category	Question #	Engagement	Productivity	Learning	Cronbach Alpha
Engagement	Q1,Q2,Q3				.80
Productivity	Q5,Q6,Q7	.63			.85
Learning	Q9,Q10,Q11	.66	.59		.72
Technology	Q4,Q8,Q12	.33	.31	.29	.93

One Group Pre-Post-Survey

A pre-experimental design, one group pre-post-survey, was used with the pilot group who were introduced to netbook computers in place of their traditional textbook. The differences of the students' perceptions were determined prior to the netbook pilot in comparison to their perception after using the netbooks for one semester. Table 9 shows the percentage of students indicating some form of agreement; slightly agree, agree, or strongly agree. The one group pre-post-survey is a starting point to understand the impact of the netbook pilot because of the extraneous variables, such as teacher pedagogy, which are out of the researcher's control and may threaten the validity.

Three of the statements yielded positive growth from the pre- to post-survey: Q7, Q8, and Q12. Students indicated a slight increase in productively using their class time (Q7, +0.2%). Also, after using netbook computers for a semester, the students indicated producing higher quality of work (Q8, +1.2%) and learning better through the daily use of technology such as a laptop computer (Q12, +3.6%).

The remaining nine statements yielded negative growth from the pre- to post-survey. The most significant decrease occurred in Q9 (-4.6%) and Q11 (-4.6%) within the construct of learning. Students' overall perception of learning decreased in being challenged to think critically in class (-4.6%) and in their teacher's ability to present the curriculum in a way easy to learn (-4.6%). Two other notable decreases within the engagement construct were Q2 (-3.4%) and Q3 (-3.5%). Students' overall

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Table 9. Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) for Students in the Pilot Group.

In social studies class…	Pre N=403	Post N=380	Change
Engagement			
Q1 I am an active participant.	91.6	90.0	-1.6
Q2 I am focused.	91.0	86.6	-3.4
Q3 I am interested in what we are learning.	84.0	80.5	-3.5
Productivity			
Q5 I complete my assignments.	96.5	95.5	-1.0
Q6 I produce quality work.	96.3	96.1	-0.2
Q7 I productively use my class time.	92.2	92.4	+0.2
Learning			
Q9 I am challenged to think critically in class.	82.5	77.9	-4.6
Q10 I have opportunities to work collaboratively with other students.	90.9	88.4	-2.5
Q11 The teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	90.7	86.1	-4.6
Technology			
Q4 I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	86.4	84.2	-2.2
Q8. I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.	87.5	88.7	+1.2
Q12 I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	85.1	88.7	+3.6

perception decreased by 3.4% on being focused and 3.5% on being interested in what they were learning.

Additional survey statements were utilized in both the pre- and post-survey in order to gain an understanding of the level of integration with the

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netbook pilot group after one semester. Students responded to the statement

Indicate how often technology is currently used in your social studies class. We

currently use technology (such as computers) in social studies class to... followed

by specific areas in which students provided a frequency rating: never, less than

once a week, once a week, a few times per week, and daily. Table 10 shows the

frequency percentages of at least once a week in each area of technology use.

Table 10. Frequency Percentage of at Least Once a Week for Students in the Pilot Group.

Indicate how often technology is currently being used in your social studies class. We use technology (such as computers) in social studies class to...	Pre N=403	Post N=380	Difference
Q25 take notes	42.9	57.6	+14.7
Q26 organize information	44.3	66.3	+22.0
Q27 research information on the internet	40.2	85.8	+45.6
Q28 take quizzes/tests/assessments	30.8	29.7	-1.1
Q29 create presentations	27.4	48.2	+20.8
Q30 complete projects	32.3	55.3	+23.0
Q31 work on assignments in small groups	37.1	47.6	+10.5
Q32 communicate with other students outside of Grand Forks	19.6	10.0	-9.6
Q33 explore a topic of my interest	35.7	48.0	+12.3

All of the statements, except two, yielded positive growth from the pre- to

post-survey. Students indicated the highest increase of 45.6% (from 40.2% to 85.8%) in

using technology to research information on the Internet (Q27) (see Figure 1). Students

also noted an increase of 23% (from 32.3% to 55.3%) in using technology to complete

projects (Q30) (see Figure 2) and an increase of 22% (from 44.3% to 66.3%) in

organizing information (Q26) (see Figure 3). Figures 1, 2, and 3 show the specific
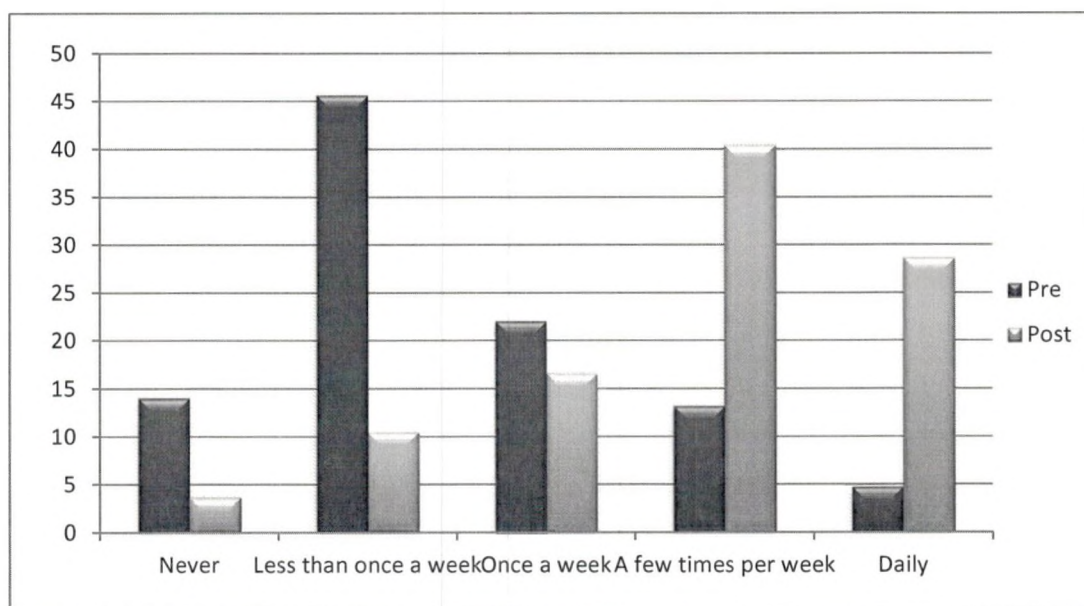
Figure 1. Frequency Percentages, Pre and Post, for Students in the Pilot Group on Using Technology to Research Information on the Internet.
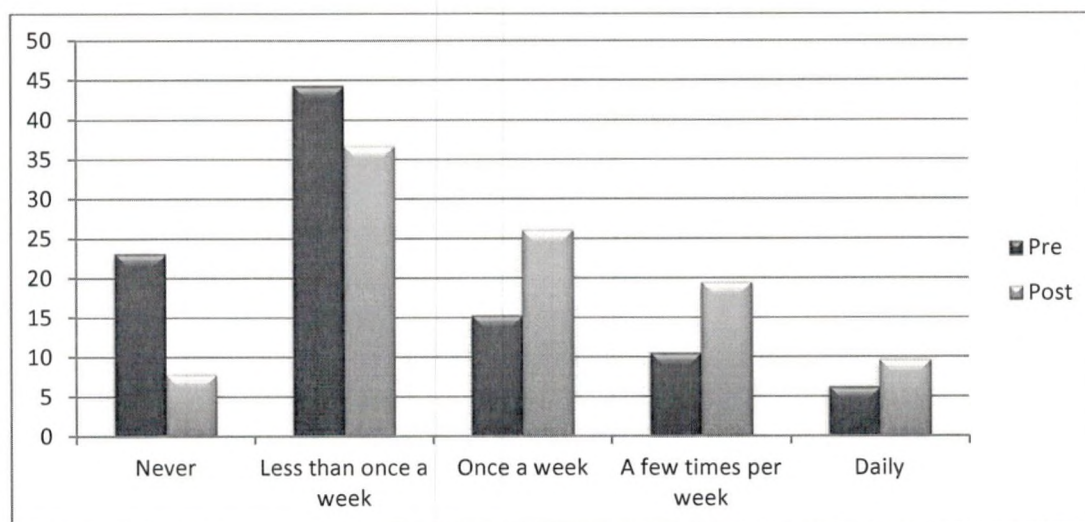
Figure 2. Frequency Percentages, Pre and Post, for Students in the Pilot Group on Using Technology to Complete Projects.

breakdown of never, less than once a week, once a week, a few times per week, and daily
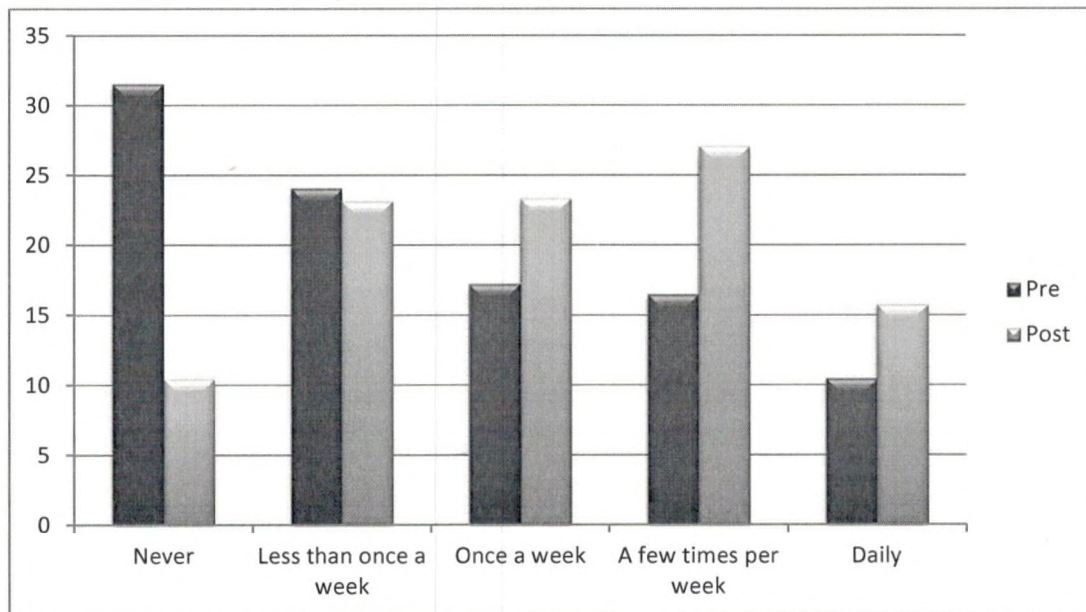
of the three highest frequency percentage changes.

Figure 3. Frequency Percentages, Pre and Post, for Students in the Pilot Group on Using Technology to Organize Information.

The two statements which students indicated a decrease from pre to post were

Q32, communicating with other students outside of Grand Forks (9.6%), and Q28, taking

quizzes/tests/assessment (1.1%). Overall, the one group pre-post-survey by the pilot

group, using the frequency rating scale, provided another way to understand the impact of

netbooks.

Pre-Post-Survey Non-Equivalent Group Design

A quasi-experimental design, pre-post-survey non-equivalent group design, was

used. Comparisons were made between the two non-equivalent groups: pilot and

control. Students in the pilot group used a netbook computer while the control group

continued to use a textbook for social studies curriculum. A pre-survey and post-survey

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were administrated to both groups to determine potential differences in perceptions toward learning social studies through the two different methods.

Table 11 shows participant responses to individual statements in the pre-survey for engagement, productivity, learning, and technology. The percentages of some form of agreement (slightly agree, agree, strongly agree) of the survey participants for each of the items are shown in three categories: all, pilot group, and control group.

For engagement, over 90% of all students perceived they were engaged and focused in their social studies class, but only 81.5% were interested in what they are learning. For productivity, over 92% of all students held the perception of completing their assignments, producing quality work, and productively using class time. For learning, less than 80% were challenged to think critically in class while over 88% indicated some form of cooperative learning. For technology, over 80% of all students held some form of agreement that technology would be beneficial in their social studies class.

Students in the pilot group had a higher percentage of some form of agreement for all statements, except Q2 on being focused, Q7 about productively using class time, and Q11 on how the teacher presents the curriculum. The largest differences occurred in the technology construct, as the pilot students had an average of 8.6% higher agreement rate in favor of the daily use of technology in their social studies class compared to the control group.

Table 12 shows student responses to individual statements in the post-survey for engagement, productivity, learning, and technology. The percentages of some form of

Table 11. Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) for All Participants and the Pilot and Control Groups in the Pre-Survey.

In social studies class…	All N=770	Pilot N=403	Control N=367
Engagement			
Q1 I am an active participant.	90.1	91.6	88.3
Q2 I am focused.	91.3	91.0	91.6
Q3 I am interested in what we are learning.	81.5	84.0	78.9
Productivity			
Q5 I complete my assignments.	94.1	96.5	91.6
Q6 I produce quality work.	94.8	96.3	93.4
Q7 I productively use my class time.	92.2	92.2	92.3
Learning			
Q9 I am challenged to think critically in class.	79.6	82.5	76.4
Q10 I have opportunities to work collaboratively with other students.	88.2	90.9	85.2
Q11 The teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	91.0	90.7	91.2
Technology			
Q4 I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	83.2	86.4	79.8
Q8. I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.	82.7	87.5	77.5
Q12 I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	80.6	85.1	75.8

agreement (slightly agree, agree, strongly agree) of the survey students for each of the

items are shown in three categories: all, pilot group, and control group.

Table 12. Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) for All Participants and the Pilot and Control Groups in the Post-Survey.

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In social studies class…	All N=617	Pilot N=380	Control N=237
Engagement			
Q1 I am an active participant.	89.5	90.0	88.6
Q2 I am focused.	87.0	86.6	87.3
Q3 I am interested in what we are learning.	82.0	80.5	84.3
Productivity			
Q5 I complete my assignments.	95.0	95.5	93.7
Q6 I produce quality work.	95.5	96.1	94.9
Q7 I productively use my class time.	92.2	92.4	92.0
Learning			
Q9 I am challenged to think critically in class.	78.8	77.9	80.2
Q10 I have opportunities to work collaboratively with other students.	89.5	88.4	91.1
Q11 The teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	87.0	86.1	88.9
Technology			
Q4 I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	83.0	84.2	81.0
Q8. I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.	87.1	88.7	84.8
Q12 I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	88.0	88.7	86.9

Pilot group students had a higher percentage of agreement for all questions in the productivity and technology constructs. In contrast, the control group had a higher percentage of agreement for all statements in the learning construct, and two of three

statements in the engagement construct. Some of the highest percentages came in the

pilot group's overall perception of agreement on productivity (92.4% to 96.1%).

Independent Samples *t* Test

To further investigate the differences between the pilot and control groups, an

independent samples *t* test was used to compare the mean scores of both groups on the

four dependent variables of engagement, productivity, learning, and technology.

Table 13 shows the independent sample *t* tests for the netbook pilot and control

groups for each of the construct categories prior to the netbook pilot. All four of the

constructs were statistically significant. Technology had the largest effect size for

statistically significant factors.

Table 13. *t* Test Comparisons: Pilot (n=403) and Control (N=367) Groups Pre-pilot
Survey (Strongly Disagree=1, Strongly Agree=6).

Constructs	*M*	*SD*	*t*	*df*	*p*	*D*
Engagement						
Pilot	4.7	.83	3.12	768	.002*	.23*
Control	4.5	.87				
Productivity						
Pilot	5.1	.73	2.30	703	.022*	.24*
Control	4.9	.90				
Learning						
Pilot	4.7	.78	2.97	766	.003*	.24*
Control	4.5	.87				
Technology						
Pilot	4.8	1.10	4.24	765	.000*	.33*
Control	4.4	1.30				

* p < .05
P value sig 2 tail

Table 14 shows the independent sample *t* tests for the netbook pilot and control groups for each of the construct categories at the conclusion of the netbook pilot. The construct of technology was the only one of the four constructs found to be statistically significant.

Table 14. *t* Test Comparisons: Pilot (N=380) and Control (N=237) Groups Post-pilot Survey (Strongly Disagree=1, Strongly Agree=6).

Constructs	*M*	*SD*	*t*	*df*	*p*	*D*
Engagement						
Pilot	4.5	.93	1.48	615	.14	.11
Control	4.4	.92				
Productivity						
Pilot	5.0	.81	.09	615	.33	.12
Control	4.9	.92				
Learning						
Pilot	4.6	.93	1.76	615	.08	.11
Control	4.5	.94				
Technology						
Pilot	4.7	1.10	4.24	615	.00*	.41*
Control	4.2	1.34				

* p < .05
P value sig 2 tail

While the effect size statistics in Tables 13 and 14 measure the strength of the relationship between the two variables, pilot and control, it also helps in determining if the difference is real or if it is due to a change of factors such as the dependent variable. The independent samples *t* test (Table 15) further compared the perceptions of students in the pilot and control groups.

Table 15. Comparisons Between Pilot and Control Groups Post-pilot Survey
(Strongly Disagree=1, Strongly Agree=6).

In social studies class…		Pilot		Control	
		M	SD	M	SD
Engagement					
Q1 I am an active participant.		4.7	.98	4.6	1.07
Q2 I am focused.		4.5	1.04	4.5	1.02
Q3 I am interested in what we are learning.		4.4	1.26	4.2	1.18
	Construct	4.5	.93	4.4	.92
Productivity					
Q5 I complete my assignments.		5.2	.92	5.1	1.11
Q6 I produce quality work.		5.0	.86	5.0	.93
Q7 I productively use my class time.		4.8	.96	4.8	1.09
	Construct	5.0	.81	4.9	.92
Learning					
Q9 I am challenged to think critically in class.		4.3	1.26	4.2	1.24
Q10 I have opportunities to work collaboratively with other students.		4.7	1.04	4.5	1.16
Q11 The teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.		4.8	1.18	4.8	1.08
	Construct	4.6	.93	4.5	.94
Technology					
Q4 I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.		4.7	1.27	4.2	1.41
Q8. I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.		4.7	1.15	4.2	1.39
Q12 I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.		4.9	1.18	4.3	1.45
	Construct	4.7	1.10	4.2	1.34

Chi-square Tests

To further investigate the differences between the pilot and control groups before

and after the netbook pilot, chi-square tests of independence were used to understand the

data. The chi-square test "measures the difference between a statistically generated expected result and an actual result to see if there is a statistically significant difference between them" (Cohen et al., 2007, p. 525). The chi-square test was calculated for the constructs of engagement, productivity, learning, and technology.

The percentages in Table 16 indicate the pilot group had a higher percentage of engagement, compared to the control group, prior to the introduction of the netbook computers. The pilot group percentage on engagement decreased after a semester with the netbook computers while the control group's engagement increased slightly.

Table 16. Comparisons Between Pilot and Control Groups Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Pre-Post-pilot Survey for Engagement.

Group	Pre-Survey	Post-Survey
Pilot	88.9	85.7
Control	86.3	86.7

Note: Pre-Survey: $\chi 2(1, N=770) = 3.85, p < .05$; Post-Survey: $\chi 2(1, N=617) = .46$, $p = .50$

Chi-square tests of independence yielded a statistically significance between the pilot and control groups of engagement on the pre-survey. When the chi-square statistic was calculated for the post-survey distribution of pilot and control groups on the construct of engagement, the results were found not statistically significant between the pilot and control. Because the pilot and control groups differed on engagement, any differences on the post-survey could be due to chance. Figure 4 visually depicts the chi-square test of independence for engagement.
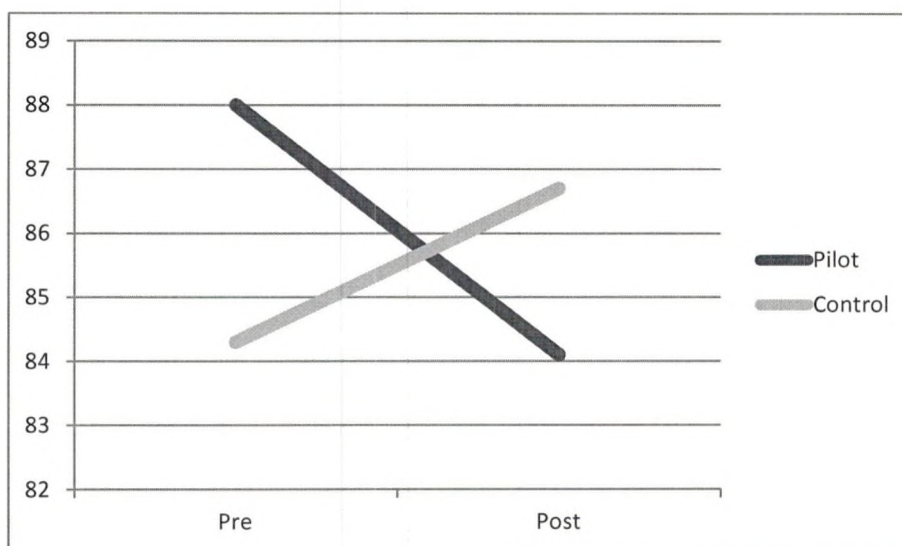
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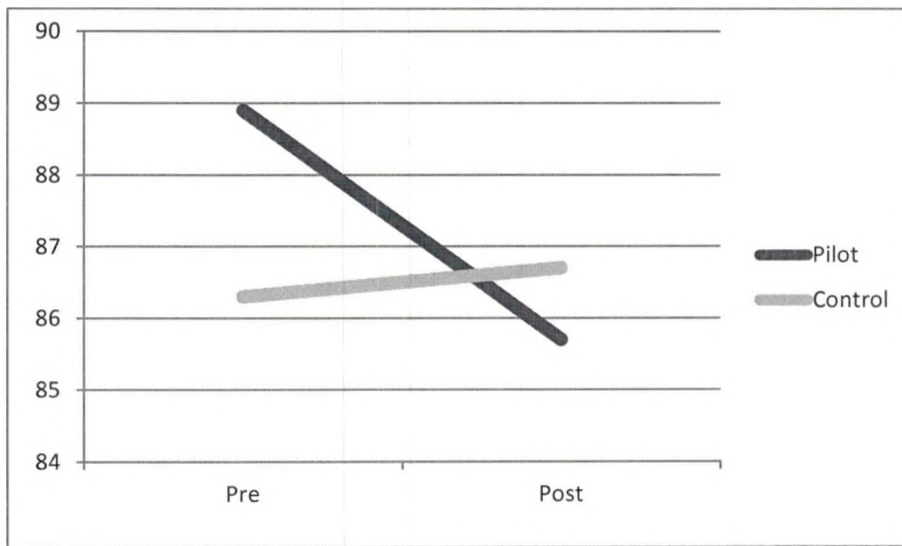
Figure 4. Pilot and Control Groups' Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Between the Pre- and Post-pilot Survey for the Construct of Engagement.

The percentages in Table 17 indicate the pilot group had a higher percentage of productivity, compared to the control group, prior to the introduction of the netbook computers. The pilot group percentage on productivity decreased slightly after a semester with the netbook computers while the control group's productivity increased slightly.

Table 17. Comparisons Between Pilot and Control Groups Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Post-pilot Survey for Productivity.

Group	Pre-Survey	Post-Survey
Pilot	95.0	94.7
Control	92.4	93.5

Note: Pre-Survey: $\chi 2(1, N=769) = 1.97$, $p = .161$; Post-Survey: $\chi 2(1, N=617) = 4.27$, $p = .04$ or $p < .05$

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Chi-square tests of independence failed to yield statistically significant differences between the pilot and control groups of productivity on the pre-survey, but when the chi-square statistic was calculated for the post-survey distribution of pilot and control groups on the construct of productivity, the results were found to be statistically significant between the pilot and control. Because the pilot and control groups differed on productivity, any differences on the post-survey could be due to chance. Figure 5 visually depicts the chi-square test of independence for productivity.
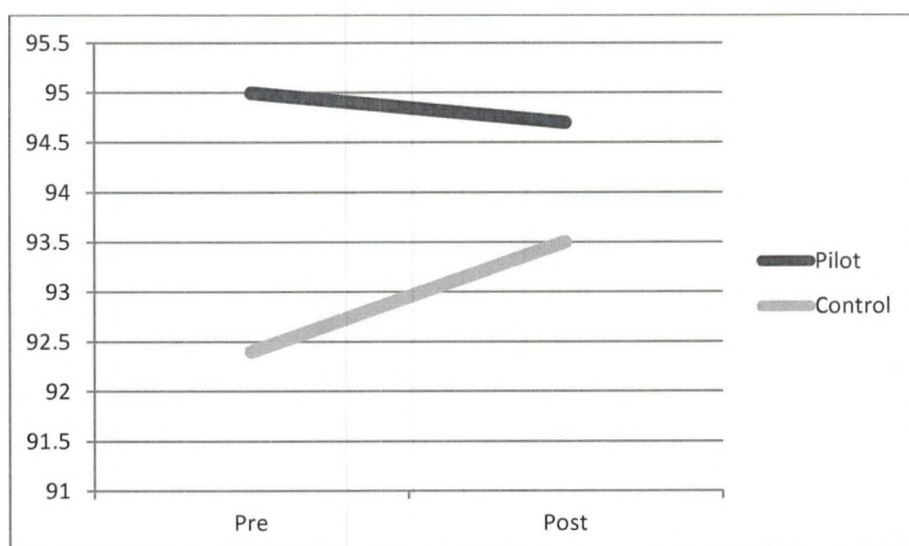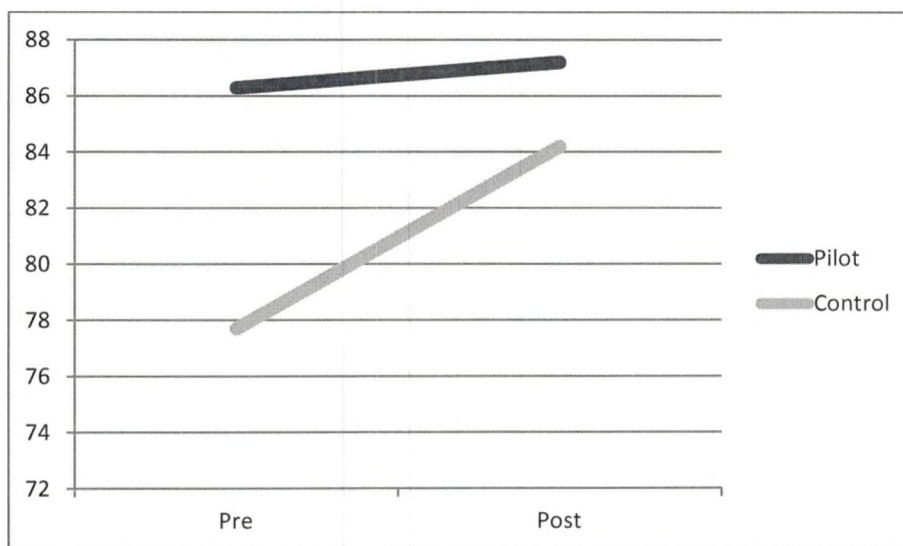

Figure 5. Pilot and Control Groups' Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Between the Pre- and Post-pilot Survey for the Construct of Productivity.

The percentages in Table 18 indicate the pilot group had a higher percentage of learning, compared to the control group, prior to the introduction of the netbook computers. The pilot group percentage on learning decreased by almost 4 percentage points after a semester with the netbook computers while the control group's learning increased.

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Table 18. Comparisons Between Pilot and Control Groups Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Post-pilot Survey for Learning.

Group	Pre-Survey	Post-Survey
Pilot	88.0	84.1
Control	84.3	86.7

Note: Pre-Survey: $\chi2(1, N=768) = 3.85$, $p < .05$; Post-Survey: $\chi2(1, N=617) = 1.05$, $p = .31$

Chi-square tests of independence yielded a statistically significance between the pilot and control groups of learning on the pre-survey, but when the chi-square statistic was calculated for the post-survey distribution of pilot and control groups on the construct of learning, the results were found to be not statistically significant between the pilot and control. Because the pilot and control groups differed on engagement, any differences on the post-survey could be due to chance. Figure 6 visually depicts the chi-square test of independence for learning.

The percentages in Table 19 indicate the pilot group had a higher percentage of students wanting to use more technology, compared to the control group, prior to the introduction of the netbook computers. The pilot group's percentage on technology increased by almost 1 percentage point after a semester with the netbook computers while the control group's percentage on technology also increased.

Chi-square tests of independence yielded a statistically significance between the pilot and control groups of technology on the pre-survey, and when the chi-square statistic was calculated for the post-survey distribution of pilot and control groups on the

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Figure 6. Pilot and Control Groups' Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Between the Pre- and Post-pilot Survey for the Construct of Learning.

Table 19. Comparisons Between Pilot and Control Groups Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Post-pilot Survey for Technology.

Group	Pre-Survey	Post-Survey
Pilot	86.3	87.2
Control	77.7	84.2

Note: Pre-Survey: $\chi2(1, N= 67) = 12.08, p = .001$ or $p < .05$; Post-Survey: $\chi2(1, N=617) = 21.60, p = .00$ or $p < .05$

construct of technology, the results were found to be statistically significant between the

pilot and control. Figure 7 visually depicts the chi-square test of independence for

technology.

Conclusions can begin to be drawn and answers to the research questions can be

established based on the quantitative data gathered and presented. Because this study

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Figure 7. Pilot and Control Groups' Percentage of Some Form of Agreement (Slightly Agree, Agree, Strongly Agree) Between the Pre- and Post-pilot Survey for the Construct of Technology.

used a mixed-methods approach, qualitative data will be presented in order to understand the impact of the netbook pilot in greater depth.

Qualitative Results

In addition to the quantitative survey data presented in the previous section, the qualitative data comprised of student responses to an open-ended statement regarding the netbook pilot, pilot teachers' open-ended responses to statements and questions throughout the pilot study, and researcher's observation of the pilot classrooms. Pilot classrooms were observed to further understand the pilot students' and teachers' responses regarding the netbooks. Non-pilot classrooms were not observed because the students and teachers were not utilizing the netbooks and thus not asked to respond to the open-ended statements on the use of the netbooks. The researcher used Lichtman's (2010) terminology of codes, categories, and concepts (p. 197) to analyze the qualitative data.

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As a component of the post-survey, the students who participated in the netbook pilot had an opportunity to respond to the statement *"Please describe, in detail, both positive and negative aspects of using the netbooks in your social studies class this semester."* Based on the nature of the open-ended response question, the responses were first categorized into positive and negative responses.

The positive responses were coded. From the codes, five categories emerged from the survey responses that highlighted the overall positive impacts of the netbook pilot: learning, productivity, engagement, technology, and other. Positive impacts were also coded from the classroom observation data and pilot teacher responses data through the same categories. Each category is supported with the qualitative data gathered.

Learning

The first concept to emerge from the data was learning. Through the coding of the positive survey responses, multiple students directly highlighted the netbook's effect on their learning. From the codes on learning, categories of learning were determined to further describe the students' overall perceptions within the concept of learning. The categories included learning through the use of a netbook versus a textbook, learning through researching information on the Internet compared to print sources, learning through projects and presentations, and learning through current events and global connections.

Students indicated the netbooks helped them learn, but 13% of the students specifically indicated how the netbooks directly impacted their learning. One student wrote, "I like using the netbooks because they give us a chance to look and learn about things outside the school doors," while another student wrote, "I think that it is easier for

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me to learn because I have all this information at my fingertips." Other students noted

the netbooks are "the best way to learn things" and have "improved my learning

experience."

Textbooks

As a category of learning, 53 students took the opportunity to specifically address

how the netbooks changed their learning because the traditional textbook was often

replaced by the online textbooks. Codes of not having to carry a textbook and being able

to access the online version at home emerged from the comments. Students noted the

online textbook allows students "to access the book's information outside of the

classroom" and another perceived it was easier to do homework because "you don't have

to carry home a lot of books." Some students also noticed the differences in content

between the textbook and netbook. One student made note the netbooks "allow us to

expand our knowledge beyond the textbook." Finding information is "so much easier

than paging through a textbook" and allows "us to access more sources of in-depth

information than just our book," according to two students. One teacher also noticed

similar benefits of using the netbook in comparison to a textbook because the

"information was up-to-date. There is nothing worse than having to work out of a book

that is outdated" (pilot teacher, May 2011).

Information/Internet/Research

Codes pertaining to learning through researching information on the Internet

compared to print sources were frequent. "Using the netbooks allows one to further

research a topic that is limited in the textbook," commented one student. In fact, 26% of

the netbook pilot students perceived the netbooks made researching information much

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easier. One student perceived the netbooks "to be very useful when we had to make projects and search for information." The ability to quickly and independently access information on various topics was highlighted by many students. One student perceived using the netbooks as "a unique opportunity to use the internet as a resource more often" while another commented on the access to be able to "explore and research current events, history, and politics, and countless other useful things." One teacher made note of the netbooks used for research: "I think that they [students] are able to go deeper because there are more resources/tools to help them gain information. For example, finding current videos, pictures, text pertaining to the curriculum" (pilot teacher, March 2011).

The researcher also coded, from classroom observation field notes, the netbooks being used to access the Internet for research during 9 of the 10 observations. Ready access to the netbooks and internet provided one teacher the opportunity to have students "open up a new tab, go to Google, and find out how/why Lincoln won the election; do some reading and research" (pilot teacher, May 2011).

Projects and Presentations

A smaller number (4%) of the responses pertained to using the netbook to assist in projects and presentations. One student perceived "the netbooks makes it much easier to do presentations and projects" while another made note of sharing "your projects with a wider audience." One teacher noted the benefit of using the netbooks to increase projects and presentations: "Most kids do not like to present, but I have noticed that because we are doing so much of it now, most kids are OK with it. In fact, some kids that wouldn't

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present in the beginning of the year, do it on a regular basis now" (pilot teacher, April 2011). As noted, some of the netbook's benefits can be indirect.

Observations of students working on projects and/or giving presentation were coded. Students were working on a bucket list project in one class, presenting current events in a 7th grade class, writing a research paper in an 8th grade class, and participating in a stock market simulation in a high school setting.

Global Connections and Current Events

The importance of the netbooks as a means to connect to the world was noted by a handful of students. According to one student, the netbooks make "it easier to communicate and see what's happening around the world" while another described the access as "a world of possibilities at our fingertips." The netbooks provided the opportunity to "become more connected to the modern world and learn about current events all around the world that we may not have seen or known about without the netbooks." In fact, one student highlighted a specific example: "When the whole Libya thing started, our teacher told us to read news articles and then he would ask us questions on some of the basic things we should have learned." Additionally, one classroom observation made note of students working on a current events project in relation to the unit on Africa.

Teachers also used the netbooks to enhance the global learning experience for students. "We just Skyped a former Grand Forks student who is reporting in Egypt about all that is happening. Talk about real people living real life and our students seeing that anything is possible for them. Also, we were right in the middle of all that was going on, the kids really liked it!" (pilot teacher, March 2011). Another teacher indicated the

"world is constantly changing. I think the netbook is the best tool to use to adjust and stay current with the world" (pilot teacher, May 2011).

Productivity

Another concept emerged from the data was productivity. Through the coding of the positive survey responses, multiple students made note of how the netbooks have led to an increase of productivity. Productivity emerged as a category which further described the students' overall perceptions within the concept. The categories included using Google Docs™ to access assignments outside of class, the netbooks being useful and helpful to complete assignments, the netbooks assisting organization, and being able to type versus write on the netbooks.

Google Docs™ and Sharing Assignments

Ten percent of the 380 pilot students specifically addressed being more productive through the use of Google Docs™. Google Docs™ is a web-based program that allows students to access, organize, and complete assignments. Codes emerged as students highlighted the benefits of being able to work on assignments on the netbooks, other computers in the school, and at home. According to one student, "the most positive thing about the netbooks this semester is that we got to set up account on Google Docs™ so that we can do our assignments anywhere we need to and so we don't have to just do it at school" while another student liked being "able to do more work at home."

Students mentioned the ease of being able to share assignments with teachers. One student perceived Google Docs™ made "it is easier to hand in work because you just have to share it" and another student likes it "when the teacher makes it easy to send papers due to him online to his inbox so you can work on it at home." Google Docs™

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also allowed for an increased access to communicate with teachers. One student

perceived it was "easy to communicate with the teacher."

Google Docs™ allowed teachers to share notes and assignments with students.

Many students noted when teachers shared notes and PowerPoint presentations through

Google Docs™. One student perceived it helpful to be able to "take notes on a copy of

the PowerPoint that my teacher has shared and is lecturing on." One of the pilot teachers

also highlighted the benefits of sharing PowerPoint notes and assignments on Google

Docs™ with students: "Instead of taking notes the old fashioned way, I feel more

confident that the kids now have the maps, paintings, and information and we can discuss

more of the actual history of the topic and it is less of kids ignoring me talking while they

feverishly write" (pilot teacher, March 2011). In addition, another student liked the fact

that "the notes are right there [Google Docs™] that you can look at any time if you miss

a day in school." The student's point was also noted by one teacher: "Sharing documents

with each other, parents, myself have opened new connections for students – especially

those who have been absent. No more lost assignments!" (pilot teacher, February 2011).

The researcher also noted the productivity of students through the use of Google

Docs™ on the netbooks. On May 10, 2011, field notes referenced "the room was

extremely quiet as the students work productively by themselves to find primary sources

for their paper." Similarly, the researcher also noted Google Docs™ was accessed and

used by the students at some point during all observations.

Useful/Helpful

Students made note of the netbooks being useful, helpful, and efficient in

completing assignments. One student indicated the netbooks have led to producing "so

much more quality work" while another noted being able to "use your time productively" while working with the netbooks. According to another student, "it's not a hassle to complete assignments like worksheets or reading out of textbook, because we can do it on the computer which I think is more productive." A student summarized the usefulness: "I think that they are very useful they should be more common in the schools."

Organization

Twenty of the 380 pilot students made a specific reference to the netbooks helping organize notes and assignments. One student highlighted the fact that "your work and notes are always there and you can't really lose your work" while another student perceived "using the netbooks was perfect for organizing information because you can put notes and organize and research and everything all in one place." In general, "it makes assignments easy to keep track of and lets me organize my information that way I want."

Typing vs. Writing

The second highest number of student responses occurred in the category typing versus writing. Twenty-two percent of the 380 pilot students indicated the netbooks were more productive because it is easier and faster to type instead of write. One student "liked typing more than writing because it's faster and more productive" while another stated, "It is a lot faster to type for me than to write out the same words so the gross productivity of me as a student has increased."

Some students noticed an increase in the length and quality of their work. Two students made specific reference to the increase: "I have been writing longer essays

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because it is easier to type than to write by hand" and "You can type out longer answers in a shorter amount of time, so students will be able to answer the question more in depth then they would on a paper." In addition, students indicated the ease of taking notes during a lecture. One student perceived note taking was much easier with the netbook "so I don't mind taking more notes." Another student perceived using the netbook has made it "easier and quicker to take notes and keep up with the teacher when he is lecturing than it would be if we were trying to write it all down" while another student perceived "the netbooks have made lectures and note taking nice, because I can take notes on the computer, which is much easier than on paper."

Using the netbooks to write and edit papers was also noted. The netbooks "make writing papers way easier" and "make correcting rough drafts easy and lets me write down more of my ideas." Finally, a student perceived the netbooks allowed "me to write more, read what I am writing, write faster, write my whole idea." Doing more work better was a direct impact of the netbook computers.

Engagement

Another concept to emerge from the data was engagement. Through the coding of the positive survey responses, students, to a lesser degree than the other two concepts, made note of how the netbooks have led to a more engaging learning environment. Twenty-two of the 380 pilot students made specific reference to the category of engagement, as determined by the researcher. Teachers, on the other hand, provided numerous comments regarding a more engaging environment after the introduction of the netbook computers. The category of engagement included students being more focused, interested, and engaged.

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Focus/Interest/Engagement

Some of the students indicated a more engaging learning environment after the introduction of the netbooks. Other related student comments included "more 'hands on' learning," "it is a good way to get students involved," "the netbooks help me become more interested in social studies," and "I can focus more during lectures." One student noted being able "to find something out if you don't understand it and it isn't just the teacher doing it." Finally, one student noted a dislike of the social studies class at first, but now "likes it more because of the computers."

The teachers cited a variety of instances in which focus, interest, and engagement increased because of the netbooks. One teacher noted, "Student engagement has been high. Many of my students want to do more research and collaboration compared to where they were a month ago" (pilot teacher, February 2011) while another perceived students were "more involved and more excited about working in class" (pilot teacher, March 2011). In general, "I think that the students seem to be more engaged in my class than before. Information is a click away and they seem to enjoy the projects" (pilot teacher, April 2011). One classroom observation made note while the students were working: "For a 7th grade classroom, it was very quiet because all students are busy working on their assignment" (April 14, 2011).

One teacher noted the netbooks lead to a higher level of student engagement through the use of in-class discussions.

When something catches on, it is remarkable how much students want to be a part of it. In the past couple of weeks there has been opportunity to learn about the flood information available to us and students have had some fun predicting right

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along with the meteorologists and hydrologists. I wish I had made this more

formal, but it has been exciting to see what they can find and to share some of the

things we have watched for 14 years now. (pilot teacher, April 2011)

Another teacher used the netbooks to introduce a lesson with the intentions of generating

some interest.

The netbooks are a great tool to allow students to become more engaged in the

curriculum. We will often find time to use them along with corkboard software to

begin discussions on topics that are being introduced in that lesson. For example,

we were discussing GDP last week with students. To start the topic, I had the

students look up the top 10 GDP producers in the world and list them on

corkboard. We also used them to find America's top 10 exports. (pilot teacher,

April 2011)

Using the netbooks to tap students' curiosity was another way in which the netbooks led

to an increase in student engagement.

I like that in the course of class discussion, I can think out loud on a topic and

then say, "Hey, let's find out about _____. Go to Google and do a search" and

the kids would be off and running. I think that alone has improved interest in

topics and engagement overall. (pilot teacher, April 2011)

Student engagement, to varying degrees, was noted by students, teachers, and the

researcher's field notes.

Technology

Another concept to emerge from the data was on the netbooks or technology in

general. Through the coding of the positive survey responses, students highlighted the

benefits of the netbook computers. Teachers also provided some comments regarding the technology.

In general, students embraced the opportunity to work with technology. One student perceived "the netbooks fulfill our desires to stay close to technology." Another student focused on an additional benefit in conjunction with learning: "The good thing about being able to use the netbooks is that we get an advantage in learning."

Introduction of one-to-one netbooks within the social studies classroom on a daily basis accounted for the majority of comments on the technology. Both students and teachers recognized the convenience of having the technology in the classroom instead of moving to the computer lab or library. One student made note of the ability "to easily research things in class when it is needed instead of going to the library or computer lab" while another indicated the "netbooks offer a unique opportunity to use the internet as a resource more often rather than having to wait for a computer lab to open up." One student noted the opportunity to "take home the computer if I needed to do work on a project."

The netbook pilot teachers also appreciated having the technology in the classroom.

> I have found the librarians miss having me in their library. The computers in the library used to be my saving grace last year because the computer labs were always too darn difficult to get into. Also, with the internet at their fingertips, using books from the library has begun to fall off substantially when compared to my previous years. (pilot teacher, April 2011)

Another teacher noted "being able to work in my room" (pilot teacher, April 2011). Finally, one teacher cited the "most positive aspect is the fact that when I assign projects or papers, I don't have to worry about finding time to reserve a lab. With the netbooks having the internet, they can do their research right in the classroom" (pilot teacher, May 2011).

Other

The final concept of the positive statements included two categories not fitting into the other previous categories: green initiatives and anecdotal praise. First, students noticed the benefits of the netbooks on the environment. Students statements such as "reduces use of paper," "I love that it's on a computer and not on paper," and "the netbooks help the environment by getting rid of paper and pencils" all indicate environmental concerns are important to the students.

Finally, anecdotal praise of the netbooks was categorized. Student comments such as "the netbooks should continue to be used in many classes," "with how much we used the computers, it was very helpful always having them in the classroom," and "I love them and they are great pieces of technology!" speak to the student perceptions of the netbook pilot. One student initially "hated them because I'm kind of challenged when it comes to technology, but once you get the hang of it, they're extremely beneficial to have in class everyday." Other students also took the opportunity to lobby for continued or increased access to technology: "Let us keep the computers!!!" and "I hope we can have netbooks in every class."

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Constructivist Teaching

About the turn of the 21st century, studies concluded technology may lead to
more constructivist teaching practices (Rakes et al., 999, p. 11; Rice & Wilson, 1999,
p. 29; ROCKMAN ET AL, 2000, p. 7). But, simply adding technology to a social studies
curriculum does not automatically yield positive or even constructivist results. The
"constructivist trends in education have increased social studies educators' awareness of
the effectiveness of curriculum that engages students in learning-by-doing, problem
solving, and decision making" (Fontana, 1997, p. 1). In this student-centered approach,
students want to "*do* history, not just hear someone talk about history" (Ramaley & Zia,
2005, p. 8.17). Thus, the third research question asks, "What constructivist teaching
practices emerged in a social studies curriculum environment with each student having
access to a netbook computer?"

Students

Student comments from the open-ended survey question were used to answer the
research question. Some students recognized the netbooks created a learning
environment that allowed students to learn by doing. One student appreciated "being
able to go on the netbooks and find out the information by ourselves." Expanding
knowledge and accessing more in-depth information, beyond the textbook, were phrases
also used. Another student recognized the netbooks provided students the opportunity
"to explore and research current events, history, and politics, and countless other useful
things." Students liked the more "hands-on" approach and being able "to find something
out if you don't understand it and it isn't just the teacher doing it."

Students communicating and collaborating in a constructivist classroom are also important. Some students recognized the netbooks opened the door "to be able to communicate more easily" and were "helpful for group projects." Creativity is another key component and the students indicated the netbooks were used for projects and presentations. One student "really liked using the netbooks for projects and presentations" while another liked "creating presentations with the computers."

In a student-centered classroom, students have more critical thinking opportunities. As one student put, "Having a teacher lecture you everyday does nothing." Some of these opportunities came in the form of inquiry and discussions on current events. One student liked using the netbooks "to explore and research things that are not just going on in Grand Forks but all around the world."

Pilot Teachers

The teachers also provided input to possible constructivist teaching practices emerging in their social studies curriculum environment with each student having access to a netbook computer.

Cooperative Learning and Collaboration

Cooperative learning and collaboration are components of a constructivist classroom. One teacher recognized "cooperative learning has been going better than I expected" (pilot teacher, March 2011). The netbooks provide the opportunity for cooperation and collaboration to happen digitally. In fact, "they [students] instant message back and forth when they work on projects, they divide up the workload, and then share with each other in the group" (pilot teacher, April 2011). Another teacher identified a similar observation: "My students are so familiar with engaging someone in a

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completely digital dialog that having them work collaboratively on a Google Docs™ presentation is easy" (pilot teacher, April 2011). Another teacher also noticed the collaborative learning component: "The kids are learning to work not just with their partner, but they are learning to seek out...groups. I like the cooperation. I like the discovery of common purposes and working with kids in the room that they might have previously avoided socially" (pilot teacher, March 2011). In addition, the netbooks also opened the door to new software to assist in collaborative student learning. "The students created a team portfolio and were able to make real time investment decisions to manage that portfolio over a four week period" (pilot teacher, May 2011). The evidence reminds us that collaboration and communication do not always have to be face to face.

Critical Thinking

Providing students opportunities to think critically is another component of constructivist teaching practices. The netbooks provided opportunities for students "to go deeper with a topic. I like the deeper critical thinking that is happening" (pilot teacher, March 2011). Another teacher noted, "Students can take different paths to find their answers. It is really neat to see kids work and share with each other and me" (pilot teacher, March 2011). Over halfway through the pilot semester, one teacher thought that "kids are allowed to critically think and problem-solve much easier using the netbooks as a resource to information" (pilot teacher, April 2011). As critical thinking increases, quality of work can also increase, as one teacher observed early in the pilot.

I know that the overall quality of responses and work ethic has dramatically improved. Students are more interested in history and current events now because they can access info so much faster and can personalize the presentation and

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organization of their information in a quicker, easier manner. (pilot teacher,

February 2011)

At the conclusion of the pilot, another teacher made a similar observation regarding the

quality of work.

I think most of the students felt comfortable giving me more than just the bare

minimum when it came to composing their thoughts to essay questions.

Typically, kids just want to do the least that they have to do. I think some kids

felt "liberated" to write more, and as such, I felt that I gained a more thorough

glimpse into their thoughts. (pilot teacher, May 2011)

Finally, another teacher also noticed the difference in the quality of work early in the

pilot. "The kids are producing richer, more detailed responses and quality of work is way

up. Kids go to work without hemming and hawing and complaining. They like the

technology" (pilot teacher, February 2011). Classroom observations also noted critical

thinking components being utilized as students were required to formulate answers and/or

opinions based on their research.

Creativity

Some of the teachers utilized the netbooks as a means to increase creativity. One

teacher pointed out, "No more 'printing out' of pictures, then cutting them out and gluing

them on poster board. Now, the kids were able to make collaborative PowerPoint

(GoogleDoc Presentation Mode) projects and these were for the most part fairly

impressive" (pilot teacher, May 2011). In addition, a different teacher allowed students

to create a digital cartoon to demonstrate their knowledge.

The corkboard activities help in getting students involved with the material. They

can begin formulating questions on the topic for the day. Our recent ToonDoo

activity dealt with creating a digital cartoon on one of the four types of

unemployment. Students did ask more questions in regards to clarification on

their specific type of unemployment. (pilot teacher, April 2011)

Finally, another teacher noticed "student engagement was higher with the use of netbooks

for creative projects" (pilot teacher, March 2011).

<center>*Student-centered*</center>

Did the netbooks allow the social studies classes to become more

student-centered? When asked if the netbooks have been used to allow students to

choose the direction of a project or assignment, one teacher responded, "This is without a

doubt the best aspect of the netbooks. I like to give kids the freedom to do work within

my guidelines on something that is of interest to them. They are more likely to care

about it and to remember it" (pilot teacher, April 2011). Similarly, a teacher recognized

"the netbooks do give us more flexibility in allowing students to choose the direction of

the projects. I've had students do presentations with the traditional PowerPoint software,

but also have seen ToonDoo used along with a program called Extranormal" (pilot

teacher, April 2011).

Some of the pilot teachers reflected on using the netbooks as a means for their

social studies class to become more student-centered. "[The students] are stepping up to

the challenge to become responsible for their own learning and to work more toward

mastery through revision and collaboration rather than seeing if the teacher is happy"

(pilot teacher, February 2011). Classroom observations noted teachers were providing

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guidelines for projects, but allowing students to make some choices about the finished product; for example, bucket list, African current events, primary source paper, and the Weseed project. Two teachers made specific comments about becoming less of a disseminator of information and more of a facilitator. "This device [netbook] gives students more ownership over the material that we are covering. They are becoming responsible for generating the information on what we're learning. I am becoming more of a facilitator" (pilot teacher, February 2011). The other teacher shared a similar observation.

> Anytime a teacher can find a way to engage students in the learning process you'll see interest increasing. This project has really made me step back and be critical of my involvement on a day to day basis. I am actively trying to find ways to not "dominate" an entire lesson. The netbooks have given me another mechanism to get the students more involved and in turn, buy in more. (pilot teacher, April 2011)

It becomes noticeable some of the teachers recognized the shift was occurring from teacher-centered to student-centered.

The first part of the qualitative summary provided positive examples of the netbook pilot. In addition, the qualitative data cited some examples of constructivist teaching practices stemming from one-to-one netbook access in their social studies classroom. But, the integration of the netbooks as an integral component of their social studies curriculum did not come without challenges and frustrations. The following section provides an overview and specific examples of the negative aspects of the

netbook pilot. The negative aspects came from teacher and student responses, in addition to classroom observations.

<div align="center">Negative Aspects of the Pilot</div>

The negative aspects of the pilot were based on student responses to an open-ended statement in the pilot classrooms, researcher's observation of the pilot classrooms, and pilot teachers' open-ended responses to statements and questions throughout the pilot study. The negative perception data were coded. From the codes, three concepts emerged from the survey responses that highlighted the overall negative impacts of the netbook pilot; student misuse, technology issues, and other.

<div align="center">*Student Misuse*</div>

The second highest percentage of negative comments from the students was under the concept of misuse. Twenty-eight percent of the students (107) took the opportunity to reference the fact that the netbooks were not always being used for academic purposes. Of the 28%, a handful of students admitted they also misused the netbook at some point during the semester. For the most part, misuse indicated students accessing non-academic websites, such as Facebook, YouTube, Twitter, or other social media websites; to chat; instant message; or play games. Students admitted they "find ways to get past blocked internet sites." According to many of the students, "half of the students just chat online or go on Facebook" while another student indicated "everyone wants to be on other websites, or chatting with their friends the whole time and that is frustrating to our teacher, and makes it difficult to learn well."

Both teachers and students acknowledged that students accessing non-academic websites often leads those students from being distracted from the lecture, lesson, or

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learning. According to one student, students are distracted and "go on the internet and play games or go on popular social networking sites such as Facebook." Another student recognized the drawbacks of the netbooks: "Unfortunately many people do not always participate in class activities but instead use the computer for personal uses." The impact of being distracted may also lead to academic consequences through a personal admission: "We tend not to listen when the teacher is lecturing his notes so then when we get the test we all do bad because we have no idea what's going on."

The teachers also noted students using the netbooks were not always on task. According to one teacher, productivity began to drop after the students learned to access social networking sites through the netbooks. "They figured out how to instant message, go on Facebook, and play games. I've pretty much stopped using the netbooks, except as a research tool" (pilot teacher, April 2011). The same teacher noticed the students hurrying through assignments so they could use the netbook for games and social networking.

The final pilot teacher reflection of the semester, one question specifically probed for challenges: "*Provide a summary (list and describe) some of the challenges of having the netbooks in your classroom for your social studies instruction.*" All of the pilot teachers cited students accessing non-academic websites and being off task as the biggest challenge.

> Some students will do dumb things with them! They will try to play games, chat online, listen to music, etc. Really bright kids can stay ahead of the teacher and do a lot of bad if they want. I have not had this happen, but it could. (pilot teacher, May 2011)

In going through the internet histories today, I found that several students were off task last week. Some were social networking when they had work to do. Monitoring was a pain until we got a system worked out. (pilot teacher, May 2011)

I found I had to take much more time in making sure the kids were on task. They found it very easy to instant message each other, go on Facebook, checking out prom dresses, etc. I was concerned at the start that I might have to teach from the back of the room. I found that to be true. (pilot teacher, May 2011)

Kids were straying onto sites that they should not have been on during class time. (pilot teacher, May 2011)

The biggest challenge is keeping students on task. I found that limiting the time they had to complete the activity helped keep them focused. (pilot teacher, May 2011)

Classroom observations were always conducted from the back of the classroom in order to see the students' netbook screens. In almost all cases, the observer made note that students were not off task. One incident of a student chatting online was observed as the teacher caught the student and addressed the situation while the observer noticed one student in another class access Facebook for about 10 seconds before getting back to work. For the most part, teachers were observed moving around the room during student work time and class discussions.

Technology

The highest percentage of negative comments from the students was under the concept of technology. Thirty-seven percent of the students (140) took the opportunity to express a negative opinion regarding the technology. Through the coding of the negative survey responses, categories emerged which further described the students' overall negative perceptions within the concept. The categories included: Internet and connectivity, confusing to use, the netbook itself, and technical issues including the operating system and software.

Internet and Connectivity

Thirty of the 380 students highlighted the issues of the Internet and connectivity. The concerns had to do with students being frustrated when the netbook had issues connecting to the Internet or the speed of the Internet was slow. None of the students made reference to a continual or every day problem, but rather an occasional frustration. Teachers also made reference to the connectivity issues: "For weeks, my students struggled to find a connection to the internet" (pilot teacher, February 2011). One classroom observation made note of connectivity issues. One student commented, "It's taking me forever to connect," while another during the same class said, "Yeah, my netbook is messing with me right now." According to the teachers, connectivity issues were challenging early in the pilot semester, but were rectified, to a certain degree, throughout the pilot. Nonetheless, all of the teachers noted connectivity issues at some point throughout the semester. One teacher stated, "Kids would lose access to the net and then lose the last few minutes of work" (pilot teacher, May 2011).

Confusing to Use

Twenty of the 380 students highlighted the issues of the netbooks being confusing, complicated, and difficult to use. One student indicated "these netbooks are harder and more frustrating to work with than normal laptop computers."

The Netbook Itself

Thirty-five of the 380 students highlighted issues with the netbook itself. The comments almost all cited the small keyboards and screens as a frustration. As one student indicated, the netbooks "are small and hard to type on."

Technical Issues Including the Operating
System and Software

Fifty-five of the 380 students highlighted technical issues, including the operating system and software. The codes covered a wide range of concerns, including glitches, freezes, shuts down, and slow. According to one student, "they [netbooks] freeze up a lot and get very slow at times," and another referenced that it "sometimes takes them a long time to load and they can lose your saved information." One student's opinion indicated "these netbooks are slow and the operating system is garbage."

Other

Several miscellaneous comments did not fit into one of the previous listed categories, but, nonetheless, are noteworthy. Five students indicated getting bored with using the netbooks every day. As one student put, "It gets pretty repetitive using them [netbooks] everyday and I don't really like using them all the time." Four students cited the storage system as a negative. One student cited the fact that "they [netbooks] would be stored in the room and would not be put away in an organized way and some would

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not be plugged in." Another concern was the inability of some students to access online assignments at home if students do not have a computer. According to one student, "I don't have my own computer and it's just easier to remember the assignments when they are on paper." Another student made note of student-athletes and the need to work on assignments while traveling to away games: "If we have an assignment that we need the netbooks for and we have homework, it is impossible to do it when sports teams have out of town games. I can't go on the internet on the bus and I'm not going to stay up until the middle of the night trying to get the assignment done." Finally, 29 of the 380 students provided a wide range of negative anecdotal comments. Many of the comments recommended an upgrade from the netbooks to a Mac, iPad, Windows, etc. Also, a few were not interested in using the netbooks again and a couple would prefer textbooks, notebooks, and paper assignments.

While numerous students had positive comments about being able to type faster on the netbook in comparison to writing, not all students and teachers shared the same highlight. One student thought "it takes a little bit longer than writing the notes" and another student made note: "A bad thing is that you have to type if you are a bad typer." One of the pilot teachers also made reference to some students' poor typing skills: "Several of my students do not know how to type. Three of my students have abandoned the netbook because they cannot type and are back to pencil and paper – they did this on their own and against my wishes" (pilot teacher, February 2011).

Another concern highlighted, but not addressed in this study, was the impact on academic progress. According to one teacher,

The netbooks are frustrating. Right now, I do not see any benefit in this

technology. In the last unit I worked on with my AP class, we used the netbooks

almost exclusively, and on their test, scores were horrible. They spent too much

time using the netbooks to go off on other things, instead of concentrating on the

unit we were studying. (pilot teacher, April 2011)

Another teacher was concerned about the potential for cheating. "Cheating can be an

issue anytime, but some assignments were hard to check for document sharing" (pilot

teacher, May 2011). Finally, one teacher admitted "the biggest challenge for me is the

fact that the kids adapt so much more quickly to the technology than I do" (pilot teacher,

May 2011).

Summary

Chapter IV presented both quantitative and qualitative data in order to answer the

research questions of this study. Quantitatively, frequencies and percentages of

demographics for both pilot and control groups, independent samples t tests, and

chi-square tests were used to analyze the data. Qualitatively, the codes and categories

were presented via the study to student and teacher answers to open-ended statements and

questions and classroom observation field notes.

Chapter V presents a summary of the study, conclusions drawn from the results,

and recommendations.

CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSION,
AND RECOMMENDATIONS

This final chapter presents a summary, conclusion, discussion, and recommendations of the study.

Summary

Compared to other curriculum areas, the integration of technology in social studies has lagged and been traditionally underdeveloped (Zhao, 2007). The researcher sought to understand the impact of a netbook pilot in five social studies classrooms. Although not all of the quantitative data revealed statistically significant differences between the pilot and control groups, the data provided insights into the netbook pilot. On the other hand, the qualitative data appear to present an overall, positive picture of the netbook pilot.

The purpose of this study was to ascertain the impact of a one-to-one netbook initiative on learning in five social studies classrooms. Quantitative and qualitative data were collected and analyzed to determine the overall impact. Quantitatively, perception data, through a quasi-experimental design, pre- and post-survey, and data through a pre-experimental design, one group pre-post-survey, were analyzed in order to understand the impact of the pilot. In the pilot groups, each student had access to a netbook computer in comparison to the control groups having access to a traditional textbook. The study explored the impact on student engagement, productivity, and

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learning of social studies through the utilization of a netbook computer. Qualitatively, data from classroom observation field notes and answers to an open-ended survey statement and questions were coded to further understand the impact of the netbook pilot.

Conclusions and Discussion

Research Question 1: What were students' perceptions of engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

The constructs of engagement, productivity, learning, and technology were developed in order to analyze the perception data. According to the quantitative data, the overall student perception of engagement, productivity, and learning in the pilot group declined from the pre-survey at the beginning of the semester to the post-survey at the end of the semester. Student perception of engagement, productivity, and learning in the control group increased from the pre-survey at the beginning of the semester to the post-survey at the end of the semester. The construct of technology yielded positive perception increases in both the pilot and control groups. Specific results from each construct are summarized below.

Engagement

Both the independent samples *t* test and chi-square tests showed that pilot group students perceived a decrease of engagement and the results were determined to be not statistically different. In other words, students who used a netbook for one semester had a lower (-3.2%) perceived agreement of their engagement from the beginning of the semester (88.9%) before having access to a netbook compared to the end of the semester (85.7%) after having access to a netbook. At the same time, students who did not use a

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netbook had a higher perceived agreement of their engagement (+0.4%) from the beginning of the semester (86.3%) compared to the end of the semester (86.7%). While an increase of 0.4%, students in the control group perceived to have a slight increase in engagement. Although an average of 86.2% of the students indicated some form of agreement on being engaged in their social studies classrooms, educators may want to consider why 14% of the students maintain the perception of being disengaged, and determine what changes should be made, and/or what it will take to engage all learners.

Because netbook pilot students' perception of engagement on the post-survey decreased after a semester of utilizing the netbooks, consideration of possible reasons should be analyzed. One possible reason is students became less engaged because of the netbooks compared to their engagement before the netbooks were introduced. Other variables may be used to explain the decrease. Because the post-survey was administered in May 2011, students' overall attitudes toward school often decrease at the end of the school year which may have led to the perception decrease in engagement. But, the same rationale cannot be used to explain a perception increase of engagement in the control group. Student engagement should continue to be monitored by educators, because research suggests that with or without technology, teaching and learning practices engaging students are essential for students in the 21st century (Cuban, 2001, pp. 14-15; National Survey of Student Engagement, 2011; Windham, 2005, p. 5.12).

The qualitative data provide additional perspectives on engagement. Without being prompted on engagement, pilot students made several specific references to engagement after the introduction of the netbook computers. The integration of the netbooks allowed for social studies to become more engaging for some learners

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evidenced by comments such as "the netbooks help me become more interested in social studies," and liking social studies "more because of the computers." In addition, classroom observations by the researcher noted student engagement. For the most part, students were on task, interested, and motivated with the task at hand while using the netbooks. A summary of the qualitative data on engagement appears to show that students and teachers perceive a more engaging social studies learning environment.

Creating engaging academic environments should always be the goal of educators. The research of Collins and Halverson (2009, p. 111), Prensky (2005/2006, p. 2), U.S. Department of Education, Office of Educational Technology (2010, p. 17), Wagner (2008, p. 188), and Yazzie-Mintz (2010, p. 11) shows technology may hold the key for educators to make learning more engaging and prepare students for the future. Students need to be engaged in order for their learning to be meaningful, and technology may provide a means to engage more learners.

Productivity

Both the independent samples *t* test and chi-square tests showed a perception of a decrease of student productivity for the pilot group students and the results were determined to be not statistically different. In other words, students who used a netbook for one semester had a lower (-0.3%) perceived agreement of their productivity from the beginning of the semester (95%) before having access to a netbook compared to the end of the semester (94.7%) after having access to a netbook. At the same time, students who did not use a netbook had a higher perceived agreement of their productivity (+1.1%) from the beginning of the semester (92.4%) compared to the end of the semester (93.5%). Nonetheless, the overall perceived productivity of students in the pilot group was 94.7%.

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Although pilot students indicated a slight decrease in overall productivity, they did indicate a slight perception increase (+1.6%) in productivity through the use of technology (survey statement Q8): *I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.* A conclusion can be drawn that students in the pilot group perceived a slight decline in their overall productivity at the end of the semester, but the netbooks provided the opportunity for students to become more productive. The findings support the research by Project Tomorrow (2011) that students "are tapping into a wide range of technology tools and services to enhance their learning productivity" (p. 2). The U.S. Department of Education, Office of Educational Technology (2010) also highlights the importance of technology for students to use to become more productive in the way they learn, are assessed, and taught (p. 64).

The qualitative data provided additional perspectives on productivity. Students were able to access Google Docs™ more readily with the introduction of the netbooks. Organizational factors such as sharing assignments online with teachers, access to assignments at home, and not losing assignments were themes. In addition, without being specifically prompted on the construct of productivity, 22% of the students indicated using the netbooks enabled their learning to become more productive. For example, one student "liked typing more than writing because it's faster and more productive." Finally, the access of Google Docs™ through the netbooks was appropriately and productively used during all classroom observations.

The netbooks provided a means, through the use of Google Docs™, to allow students to become more organized and productive. After all, our students today have not

known life without technology and are less patient with traditional methods of learning such as taking written notes and filling out and handing in worksheets (Collins & Halverson, 2009, p. 3; McNeely, 2005, p. 4.3; Oblinger & Oblinger, 2005, p. 2.16). Today's students thrive in online learning environments accessed through technology at school. A direct impact of the netbook computers, from the students' perspective, was an increase of productivity.

Learning

Both the independent samples *t* test and chi-square tests showed a perception decrease of student learning for the pilot group students and the results were determined to be not statistically different. In other words, students who used a netbook for one semester had a lower (-3.9%) perceived agreement of learning from the beginning of the semester (88%) before having access to a netbook compared to the end of the semester (84.1%) after having access to a netbook. At the same time, students who did not use a netbook had a higher perceived agreement of their learning (+2.4%) from the beginning of the semester (84.3%) compared to the end of the semester (86.7%). Because netbook pilot students' perception of learning decreased after a semester of utilizing the netbooks, further analysis of learning, through the use of assessments, should be utilized in order to determine academic growth.

Although pilot students indicated a slight decrease in overall learning, they did indicate a slight perception increase (+0.7%) in learning through the use of technology (survey statement Q12): *I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.* A possible conclusion is that students in the pilot group perceived a decline in their overall learning at the end of

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the semester, but the netbooks provided the opportunity for students to learn better. The findings support the research indicating how students want to learn through the use of technology. The "leveraging of small, portable devices to facilitate anytime, anywhere, un-tethered learning" and "the proliferation of a wide range of mobile devices in students' pockets and backpacks" (Project Tomorrow, 2011, p. 4) have the potential to increase the learning opportunities not previously realized in education.

According to the qualitative data, 13% of the pilot students specifically responded to the open-ended statement "Please describe, in detail, both positive and negative aspects of using the netbooks in your social studies class this semester" regarding how their learning had been impacted. Student comments such as "I think that it is easier for me to learn because I have all this information at my fingertips" and the netbooks are "the best way to learn things" suggest the netbooks are not just a toy or novelty, but rather it is the way students are interested in learning. The researcher also documented authentic learning situations, through observations and field notes, such as current events and Internet research.

Technology

Both the independent samples *t* test and chi-square tests for the pilot group students showed a perception of an increase of technology and the results were determined to be statistically significant. In other words, students who used a netbook for one semester had a higher (+0.9%) perception of social studies class through the use of technology from the beginning of the semester (86.3%) before having access to a netbook compared to the end of the semester (87.2%) after having access to a netbook. At the same time, students who did not use a netbook had an even higher perceived agreement

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of the importance of technology (+6.5%) from the beginning of the semester (77.7%)

compared to the end of the semester (84.2%). The increase in percentage on technology

for the pilot group highlighted the perceived importance of the use of technology in social

studies. Also, the higher percentage for the control group indicated the students' desire to

incorporate more technology into the social studies curriculum.

Student perceptions on survey statement Q8: *I feel that I would produce higher*

quality work through the daily use of technology such as a laptop computer (+1.6%) and

survey statement Q12: *I feel that I could learn better through the daily use of technology*

such as a laptop computer rather than a textbook (+0.7%) indicate a slight increase in the

overall perception of the role technology plays in their social studies class. Zhao's

(2007) research reinforced the premise that social studies textbooks were considered

boring in contrast to more current and interesting information on the Internet (p. 318).

The findings in this section also support position statements released by the NCSS on

technology and media literacy. The realities of students' lives include technology, so an

emphasis must be made for technology to be a tool for learning social studies (National

Council for the Social Studies, 2006). Also, the NCSS has recognized the fact students

are constantly and digitally connected outside of the classroom, so social studies teachers

need to make learning relevant and meaningful for their students through digital world

resources (National Council for the Social Studies, 2009).

The qualitative data support the NCSS position statements, because students

embraced the opportunity to work with technology. As one student indicated, "The

netbooks fulfill our desires to stay close to technology." Another student focused on an

additional benefit of the netbooks enabling "us to expand our knowledge beyond the

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textbook." Finding information is "so much easier than paging through a textbook" and allows "us to access more sources of in-depth information than just our book," according to two students. Classroom observations also made note of students' comfort level in using the netbooks in their social studies class.

A conflict exists between the quantitative and qualitative data in research question 1: "What were students' perceptions of engagement, productivity, learning and technology in a social studies curriculum environment with each student having access to a netbook computer?" Student perception, through the quantitative data, did not reveal all statistically significant differences between the pilot and control groups nor did all of the data indicate an increase in positive perceptions of social studies in the netbook pilot classrooms. On the other hand, student perceptions demonstrated by the qualitative data presented an overall, positive picture of the netbook pilot.

Research question 2: What were teachers' perceptions of engagement, productivity, learning, and technology in a social studies curriculum environment with each student having access to a netbook computer?

Throughout the netbook pilot, the pilot teachers were asked to respond to a variety of statements and questions in order for the GFPS SSSC to gain insights into the pilot. Approximately every four weeks, the teachers submitted answers to statements and questions provided to gain perceptions on their teaching and the netbook environment in general. In addition, teachers responded to varied statements and questions on student learning, engagement, productivity, and technology. Finally, in order to understand the big picture, specific questions were asked regarding struggles and challenges.

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Engagement

Overall, teachers noted positive gains of student engagement throughout the first couple of months of the pilot before leveling off. Teachers made note of their social studies classroom becoming more engaging with the netbooks. "Student engagement has been high…compared to where they were a month ago" (pilot teacher, February 2011) and "I think that the students seem to be more engaged in my class than before" (pilot teacher, April 2011). Another teacher also noted the netbooks were "a great tool to allow students to become more engaged in the curriculum" (pilot teacher, April 2011). After three months, three of the pilot teachers indicated the novelty and interest in using the netbooks diminished somewhat. In general, the teacher perception of student engagement supports Prensky's (2005/2006) research: "If educators want to have relevance in this century, it is crucial that we find ways to engage students in school…we must engage them in the 21st century way" (p. 2).

Productivity

Overall, teacher perceptions indicated positive results with student productivity throughout the pilot. Teachers made note of an increase in organization and productivity through the use of Google Docs™, accessed through the netbooks, which "opened new connections for students – especially those who have been absent. No more lost assignments!" (pilot teacher, March 2011). Teachers made note of a decline in student productivity, similar to engagement. The productivity issues often resulted from students learning how to access the social networking websites and instant messaging options.

This section highlights the need for teacher training in implementing and using technology in their classroom. Simply adding netbooks to an existing social studies

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curriculum may or may not yield positive results in student productivity. Nonetheless, the research explains that educators need to "make the fundamental structural changes that technology enables if we are to see dramatic improvements in productivity…to learning, assessment, and teaching processes" (U.S. Department of Education, Office of Educational Technology, 2010, p. 64).

Learning

Overall, teacher perceptions indicated positive results with student learning throughout the pilot. Teachers made note of an increase in the quality of responses, work ethic, and interest in history and current events because of the ability to access information so much faster through the netbooks. The netbooks provided the opportunity for students to become responsible for their own learning. Most of the teachers' perceptions frequently supported the Partnership for 21st Century Skills' (2007) findings that technology changes the ways in which learning takes place (p. 6). On the other hand, after three months into the pilot, one teacher indicated, "Right now, I do not see any benefit in this technology. In the last unit I worked on with my class, we used the netbooks almost exclusively, and their test scores were horrible" (pilot teacher, April 2011). The teacher's perception parallels Mason et al.'s (2000, p. 10) and Bebell et al.'s (2010, p. 31) research on learning with technology which states little empirical evidence over the past decade demonstrates the use of technology does not positively impact student achievement. The mixed results highlight the importance of the teacher's preparation and professional development prior to a successful netbook implementation.

Technology

Teachers' perceptions of the positive impact made by the netbooks were overall favorable. At the end of the pilot, teachers summarized some of the positive impacts:

- daily access to Google Docs™

- not having to leave the classroom or reserve a computer lab for research

- access to visual information

- access to up to date information

- increase in the quality of work

- engagement in the curriculum

- access to online software and programs to assist in student learning

The teachers' comments support Zhao's (2007) study, which concluded that through the use of technology in a social studies classroom, students became "more motivated to explore information or complete assignments using computers" (p. 320).

On the other hand, the netbooks presented some challenges to all of the pilot teachers. Through the use of the netbooks, students were found to be off task, on social networking sites, cheating by sharing assignments on Google Docs™, instant messaging other students, and playing games. One teacher noted limiting the time students had to complete the activity helped keep them focused. Teachers also found they had to monitor students and troubleshoot connectivity and technological issues. One teacher stated, "The biggest challenge for me is the fact that the kids adapt so much more quickly to the technology than I do" (pilot teacher, May 2011).

The qualitative data present both positive and negative teacher perceptions of the netbooks pilot. Overall, the positives appear to outweigh the negatives in the teachers'

perception of the netbook implementation. In retrospect, the GFPS only provided one and one half days of training and professional development for the pilot teachers to successfully integrate the netbooks into their social studies curriculum. Instead, it becomes even more important that we provide the necessary training "to help teachers understand how to use technology to facilitate meaningful learning" (Ertmer & Ottenbriet-Leftwich, 2010. p. 257). What would the impact on teacher perception and implementation have been if the professional development requirements were increased incrementally to three or four days throughout the semester? In summary, "it is impossible to overstate the power of individual teachers in the success or failure of 1:1 computing" (Bebell & Kay, 2010, p. 48). Professional development and addressing teacher pedagogy are critical in any successful technology implementation.

Research question 3: What constructivist teaching practices emerged in a social studies curriculum environment with each student having access to a netbook computer?

The research is contradictory regarding constructivist teaching practices emerging as a result of technology integration into a social studies curriculum. About the turn of the 21st century, studies concluded that technology may lead to more constructivist teaching practices (Rakes et al., 1999, p. 11; Rice & Wilson, 1999, p. 29; ROCKMAN ET AL, 2000, p. 7). On the other hand, Christensen, Horn, and Johnson's (2008, p. 83) and Cuban's (2001, pp. 133-134) research highlighted the fact that even with the introduction of computers in classrooms, traditional teaching practices have continued and student-centered learning has not increased. The findings from this study support research on both ends of the spectrum because constructivist teaching practices among

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the netbook pilot teachers emerged, to varying degrees, with the integration of technology.

The qualitative data from this study identified constructivist teaching practices, such as learning-by-doing and problem solving, in a student-centered learning environment, highlighted by researchers Doolittle and Hicks (2003, p. 12), Fontana (1997, p. 1), Ramaley and Zia (2005, p. 8.17), Rice and Wilson (1999, p. 30), and Tapscott (1998, p. 144). One teacher identified the impact of the netbooks: "Research, critical thinking, problem-solving. I like that students can take different paths to find their answers. It is really neat to see kids work and share with each other and me" (pilot teacher, March 2011). Another teacher also identified the fact that "kids have had the opportunity to go deeper with a topic" (pilot teacher, March 2011).

These findings support Doolittle's (2001) research of not just telling, but allowing students an opportunity to analyze, synthesize, and reflect on their own opinions in context of the lesson (p. 512). The data from this study also support Zhao's (2007) previous research about the role of the teacher shifting from a knowledge dispenser to that of a guide (p. 323). One teacher specifically identified this paradigm shift: "They [students] are becoming responsible for generating the information on what we are learning, I am becoming more of a facilitator" (pilot teacher, February 2011). One teacher made note that with the netbooks, the opportunities increase for students to choose the direction of a project or assignment. "This is without a doubt the best aspect of the netbooks. I like to give kids the freedom to do work within my guidelines on something that is of interest to them. They are more likely to care about it and to remember it" (pilot teacher, March 2011). Although several examples highlight

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constructivist teaching practices emerging with the integration of the netbooks, several traditional teaching practices remained.

For some teachers, the introduction of the netbooks provided a means to deliver instruction the exact same way, but with a digital component. For example, one pilot teacher uploaded a PowerPoint notes document to Google Docs™. Students were able to view the PowerPoint on their netbook and typed additional notes from the lecture. It could not be determined if the digital format did or did not enhance student learning, although some students admitted to taking more detailed notes with the netbooks. The lecture was a traditional, teacher-centered lecture in which the teacher talked and the students listened. In this case, constructivist teaching did not emerge; rather, traditional practices remained with a digital notes component added through the use of the netbooks. This example supports Windschitl and Sahl's (2002) findings that "pervasive portable technology did not initiate teachers' movement toward constructivist instruction" (p. 201). This example also supports the findings that "teachers with more traditional beliefs will implement more traditional or 'low-level' technology uses, whereas teachers with more constructivist beliefs will implement more student-centered or 'high-level' technology uses" (Ertmer & Ottenbriet-Leftwich, 2010, p. 262).

Although most likely causal in nature, frequency survey data yielded results that could be concluded as an increase in constructivist teaching practices. For example, survey results showed positive growth for using technology at least once a week to create presentations (20.8%), complete projects (23%), work on assignments in small groups (10.5%), and explore a topic of my interest (12.3%). An increase in the listed constructivist components of learning could be linked to the introduction of the netbooks.

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To answer the third research question, constructivist teaching practices did emerge in the social studies curriculum environments with students having access to a netbook computer, but to varying degrees. This finding supports Becker and Ravitz's (1999) research that "the relationship between technology use and pedagogical change…[to be] truly causal and not the mere conjunction of innovative teachers who happen to both use technology and develop a more constructivist pedagogy" (p. 381). So, the question remains as to which teachers, prior to the netbook pilot, had the propensity to incorporate a constructivist/student-centered learning environment compared to those who used traditional teaching practices. Regardless of the philosophical starting point of each teacher prior to netbook pilot, it remains unknown to what degree each teacher incorporated more or less constructivist teaching components. It can be concluded that simply adding technology to a social studies curriculum does not automatically yield positive or even an increase in constructivist practice results.

Although the findings are not consistently clear, it can be determined the netbooks did have a perceived positive impact on social studies teaching and learning in the pilot classrooms. Also gleaned from the study was an emphasis that in order to have a more engaging and productive 21st century learning environment, the introduction of 1:1 laptop technology may yield some positive results, but current, research-based teaching pedagogy far outweighs the potential technology may add. Ongoing staff development continues to be one of the tools to address teacher pedagogy and increase the capacity to meet the ever-changing needs of our students. Technology continues to be an important learning tool for our students today, and will be in the future, but it is not the most

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important. The classroom teacher remains the most important factor in providing a quality education for our students.

Limitations

Although this study utilized a variety of research methods to determine the overall impact of a pilot netbook initiative in five social studies classrooms, limitations to the study were present. The chief limitation of the current study was time. The study was conducted over the course of one semester. A longitudinal study over the course of 1-3 years would potentially provide better data and results. Another limitation of the study was the focus on perception and frequency data only instead of incorporating a means of studying academic growth. Students may have enjoyed using the netbooks, but did their academic achievement improve? A third limitation was two classroom teachers in the control group did not have their students take the post-survey. One teacher cited the lack of access to computers for students to take the online survey while the other teacher had access to computers, but was unable to access the Internet. Although the 237 students in the control group took the post-survey, the results of the post-survey were compromised because it was a decrease of 130 surveys from the pre-control group, and, more importantly, it eliminated two teachers' classes from the post-control survey. Another limitation was the researcher's potential influence on the teacher and students during observations in the classrooms. Also, the researcher only observed the classes with the netbooks and not the control classes, which was another limitation of the study. The final limitation was with the pilot teachers. Some of the pilot teachers, because they showed interest in applying to pilot the netbooks, may have already had the predisposition to try

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new things, had a firm grasp of technology, and already incorporated 21st century learning and/or constructivist teaching pedagogy.

Recommendations

The following recommendations emerged from the analysis of the data and review of the literature for this study.

Recommendations for the Grand Forks Public Schools Social Studies Steering Committee

1. In order for a seamless integration of technology, including 1:1 initiatives, systemic professional development for teachers using technology is critical.

2. Financial resources need to be allocated to hire trainers, hire technology partners/assistants/aides, and compensate teachers for the additional time dedicated to learning the new technology.

3. Based on the assumption that student engagement and productivity in a 21st century learning environment does not have to include technology, time and resources should be dedicated to all teachers understanding and practicing good teaching practices within their discipline.

4. A system of professional dialog among educators should be developed to provide assistance and support for colleagues.

5. Individual schools and curriculum areas adopting technology should consider incorporating and/or developing assessments in order to study the potential academic benefits of incorporating more technology within a curriculum area.

6. Teachers should create local, formative assessments in order to determine the academic impact technology has on students in classrooms with technology in comparison to classrooms without.

7. Consider expanding technology scope to equip more classrooms with one-to-one technology in multiple curriculum areas.

8. One-to-one initiatives per student per grade level should be initiated sooner than later and be expanded per grade level in subsequent years.

Recommendations for Further Study

1. More studies should be developed to understand the impact of academic achievement in social studies curriculum with ubiquitous access to technology.

2. The impact of one-to-one initiatives continues to be studied, but more studies need to determine best practices for ubiquitous computing.

3. Net generation students and how they learn best should continue to be studied.

Reflections

Although the quantitative data did not all reveal significant differences between the pilot and control groups, the qualitative data presented, overall, a positive picture of the netbook pilot. Netbooks have the potential to increase engagement, productivity, and 21st century learning in social studies. At the end of the pilot, teachers reflected on the potential. One teacher reflected upon the need to engage students in order to make social studies more interesting to students.

They [netbooks] are a tool that will help engage students in the classroom. I know many people are not a fan of change, but I think that we must keep our

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students interested in Social Studies. I take it personally when I hear that many students are bored in their Social Studies classes. In fact, when I think back to MOST of my Social Studies classes they were boring to me as well. I know that there are many awesome teachers working in our district, I am just saying it has to relate/engage our young people. (pilot teacher, May 2011)

Similarly, another teacher reflected on the paradigm shift that needs to occur for technology to be successfully integrated into social studies.

The potential impact of a one to one initiative is exciting. The biggest variable is can you get veteran teachers to put the time in to learn new software programs that will complement their curriculum? Learning any new program takes time and diligence and there is always the potential software glitch. With that said, I personally believe that the benefits of going one to one far out way [*sic*]the drawbacks. (pilot teacher, May 2011)

Another teacher reflected on his own personal growth in relation to how the net generation learns with technology.

It was a challenge for me as a teacher in some ways, but I think my kids can now see how the technology can be used to assist them in learning in a manner that is easier and more comfortable for them. (pilot teacher, May 2011)

Finally, when the pilot teachers were asked if they would be interested in using the netbooks the following school year, all responded with a "yes." In fact, one teacher added, "I would love to have them back! Please get them back to me" (pilot teacher, May 2011).

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Through my experiences as a classroom teacher, classroom observations as a school administrator, observations of the netbook pilot classrooms for this study, experiences chairing the secondary social studies committee, and research on 21st century learning, student engagement, technology, the net generation, and social studies, I have come to the conclusion that providing our students with current technology/personal learning devices, in conjunction with enhanced teacher pedagogy, is critical in order to meet the needs of our students. The bottom line…it's not all about the technology but rather, good teaching. Technology does provide a tool for students to learn in an environment comfortable to them.

Envision a social studies classroom in which students are using a technology device as an integral component to learning. Within that classroom, learning is active, not passive. Students are challenged to think and to solve problems that do not have easy solutions. They are allowed to pursue areas of interest and develop and defend their opinions. Rich discussion is taking place. Students are working together. And, students have opportunities for creativity and self-expression (Wagner, 2008, pp. 199-200). This is the type of social studies experience our students crave and deserve. It's time we provide this type of learning experience for our students.

APPENDICES

Appendix A

The Proposal for the Netbook Pilot in
the Grand Forks Public Schools

Grand Forks Public Schools
Social Studies Curriculum Pilot 2010-2011
June 15, 2010

Rationale

The Grand Forks Public Schools social studies teachers will complete a pilot of social

studies curriculum (textbooks) during the 2010-2011 school year. A presentation to the

school board will be made to secure approval for the social studies curriculum adoption

in the spring of 2012. A K-12 Grand Forks Public Schools SSSC has been established to

oversee the process. During the first few meetings, Dr. Brenner has presented

information regarding "21st Century Learning" and envisioning a social classroom several

years beyond 2011. Some of the information has caused some anxiety among social

teachers as they consider their classroom without a textbook. The reaction of the teachers

has lead to some questions.

Questions

- What research exists on social studies classrooms without a textbook?

- What research exists on teaching social studies with technology (laptop)?

- Has a pilot(technology)/control(traditional textbook instruction) study been
  completed in social studies classrooms?

- What would the impact be of teaching social studies without a textbook?

- Does a laptop computer initiative in a high school classroom make a difference in
  student learning?

- Does a laptop computer in place of a traditional textbook make a difference in student learning?

To Do List – 2010-2011 School Year

1. Gain permission to allow a pilot of a social studies classroom without a textbook.
2. Determine if netbooks or other technology could be used for the pilot.
3. Solicit teachers to apply and volunteer for the technology pilot.
4. Solicit teachers from the same grade level and curriculum to be the control.
    a. Different School Option:
        i. 12th Grade Economics – GFC – netbook - pilot
        ii. 12th Grade Economics – RR – pilot textbook (control)
    b. Same School Option
        i. 8th Grade U.S. history – SchMS – netbook pilot
        ii. 8th Grade U.S. history – SchMS – pilot textbook
5. Summer 2010 - Research and study 1 to 1 laptop initiatives
6. Social Studies Professional Development – Study 21st Century Learning Classrooms
7. Take semester 1 to get organized and allow teachers to prepare.
8. Complete pilots and study during semester 2.
9. Determine the impact of the pilot
    a. Survey students and teachers (pre and post)
    b. Observe Classrooms
    c. Interview students and teachers
    d. Collect and Analyze Data
10. Compare and contrast the pilot and control.
11. Present information from technology pilot to the social studies teachers.
12. Weigh pros and cons of netbooks vs. textbooks with social studies teachers.
13. Determine the social studies curriculum to adopt
14. Prepare recommendation for the school board.

Appendix B

Letter of Support for the Netbook Pilot

Grand Forks Public Schools
A Great Place to Grow and Learn!

Mission Statement:
To Provide Opportunities for All Students to Develop Their Maximum Potential

Grand Forks Education Center
PO Box 6000 (58206-6000)
2400 47th Avenue South (58201-3405)
Grand Forks, ND
www.gfschools.org

Dr. Terry Brenner, Director
Curriculum, Instruction, Assessment, & Professional Development
Phone: 701.746.2205, Ext. 116
Fax: 701.772.7739
terry.brenner@gfschools.org

To: Joel Schleicher
From: Dr. Terry Brenner, Director
Date: June 16, 2010
Re: Letter of Support to Advance Netbook Pilot

Thank you for taking time to draft the "Grand Forks Public Schools Social Studies Curriculum Pilot 2010-2011" proposal and the consideration for the integration of technology into the social studies curriculum. Also, thank you for taking time to meet with the Social Studies Steering Committee to discuss your ideas and potential of the netbook pilot.

The timing of your research is impeccable as K-12 social studies curriculum is in the study, review, and adoption year. Your interest in collecting data from students and teachers relative to a one-to-one netbook (i.e., streamlined laptop) initiative in several classrooms across the district will be of great benefit for the social studies curriculum adoption and the district technology initiatives. The concept and subsequent research are most applicable with digital learners sitting in our classrooms instructed, generally speaking, in a very traditional manner. As we engage our teachers in professional development with the intent of philosophically shifting pedagogy that is aligned with twenty-first century learning, the piloting of netbooks in carefully selected classrooms will assist us in generating authentic data to move us forward as a school district. The social studies netbook pilot and research is supported and will be used by our school district.

In order to advance this project, please follow Grand Forks Public School Policy 2130 regarding the systematic study of instructional programs and conducting educational research. Research proposals must be submitted through Mr. Jody Thompson, Assistant Superintendent of Teaching and Learning, and approved prior to initiating the project and conducting research. Remember the privacy of both students and teachers should be protected throughout the process.

Another important component will be for Mr. Darin King, Director of Technology, to determine the scope of the netbook pilot project based on his budget. Once Darin's budget is determined, the Social Studies Steering Committee will meet again to determine the next steps of soliciting volunteers to pilot the netbooks.

Feel free to contact me if you have any questions or if you need clarification.

_____*Providing Equal Opportunities in Education and Employment*_____

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Appendix C

Request to Conduct Research

GRAND FORKS PUBLIC SCHOOLS
REQUEST TO CONDUCT RESEARCH

Our school system considers it contrary to the best interests of the pupils, the schools, and the public to allow solicitation or canvassing of pupils by outside organizations within or through the public schools. Accordingly, no activities of this nature will be permitted except through specific sanction of the board. In whatever exceptions are granted, there must be an avoidance of pressure on the children and school staff in carrying out such projects.

We are reluctant to permit the pupils and school organizations to serve as a device for collecting information not pertinent to the conduct of the school program. Any request of this nature demands the close scrutiny of the administration both as to the purpose of collecting the information and the manner in which the data are gathered. In rare instances when such a request is granted, no pressure should be placed upon either children or parents to furnish information unless matters of public health or safety are directly involved.

Applications to conduct research in the schools must be made to the appropriate Assistant Superintendent prior to the commencing of the study. Approval may be granted if the project has useful implications for school improvement planning.

Experimental programs and "pilot studies" must have the approval of the superintendent's office. Experimental programs will be designed in such a manner that appropriate evaluative techniques may be applied and that such evaluations will determine the feasibility of implementing such programs on a broader base.

Request to Conduct Research in the Grand Forks Public Schools

Date: October 24, 2010	Name: Joel Schleicher	Phone: 701-746-2407 ext. 802
Fax or Email: jschleicher@gfschools.org		Research Advisor: Dr. Sherry Houdek
Address: 2211 17th Ave. S., Red River High School, Grand Forks, ND 58201		College or Dept.: University of North Dakota, Educational Leadership

Research Title:
Social Studies Pilot of Netbook Computers

Give a brief description of your research. Attach additional papers if necessary. Please attach sample copies of assessment instrument, tests, or communications to be used:

The purpose of this study is to collect and analyze data to determine the overall impact of a pilot laptop initiative in four social studies classrooms. More specifically, it will explore the impact on teaching social studies with each student having access to a laptop computer as the primary source of curriculum delivery and the impact on student learning, engagement and perception of social studies through the utilization of a laptop computer in place of a traditional textbook in a social studies classroom.

As part of the curriculum review cycle of the Grand Forks Public Schools (GFPS), the social studies department considered best practices, 21st century learning skills, a classroom without a textbook and envisioning a social studies classroom several years beyond 2011. Because of the lack of research-based studies of social studies classrooms with laptop computers in place of or supplement to traditional textbooks, two middle school and two high school teachers have the opportunity to apply and volunteer to pilot laptop computers. Data will be gathered in the following ways:

1) Surveys of teachers and students participating in the netbook pilot

2) Surveys of teachers and students in control classrooms not participating in the pilot.

3) Interviews of students and teachers.

4) Classroom observations.

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(see attachments for survey, interview and observation documents)

Number of students needed for research: **4 pilot classrooms (100)** **4 control classrooms (100)**	Number of teachers needed for research: **4 pilot teachers** **4 control teachers**	Grade Level or Dept.: **7-12 Social Studies**

What schools are you interested in conducting the research in?

Schools will be determined based on applications and selection of teachers.

Will confidential records be required? (If yes, indicate type.) **All survey, interview and observation documents will be kept confidential.**	Length of time required to complete the research: **2010-2011 School Year**

To be completed by School District Official:

Approved:		
Not Approved:		
Assistant Superintendent Signature: ~~J Thompson~~	**Date:** *10-26-10*	
Approved to conduct research in the following schools: *Schools selected based on pilot teachers.*		

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Appendix D

Correspondence to Solicit Applicants
for Netbook Pilot

From:	**Joel Schleicher**	Friday, October 01, 2010 10:32:53 AM
Subject:	Netbook Pilot Opportunity	
To:	Social Studies	
Cc:	Terry Brenner Darin King Anne Compton Terry Bohan Cindy Grabe	

Secondary Social Studies Teachers,

As we consider all forms of curriculum, in the context of student learning for our social studies pilot, 4 classrooms/teachers will have the opportunity to pilot a classroom set of netbooks. **We are looking for 2 middle school and 2 high school social studies teachers willing to pilot a classroom set of netbooks as an integral tool for student learning in your social studies classroom.** Darin has just placed the order for the netbooks, so I am unsure about the arrival date. The 4 teachers selected to pilot the netbooks will receive notification about the arrival date and some "just in time" training when the netbooks arrive. The purpose of the netbook pilot will be to gain a better understanding of the learning, engagement, and perception of students learning social studies through the use of a netbook computer. We will be gathering data through surveys, teacher and student interviews and observations in order to determine the impact of the netbooks. If you are interested, please submit a one to two page proposal including your interest in the netbook pilot in your classroom and initial thoughts on how students' learning in your classroom will be enhanced through the use of the netbook computers. In addition, teachers will be selected based on their understanding and articulation of how the introduction of netbook computers in your classroom will be associated with:

1) 21st Century Learning

2) The National Council for the Social Studies position statement on Media Literacy.
http://www.socialstudies.org/positions/medialiteracy

3) The National Education Technology Standards
http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007_Standards.pdf

If interested, your proposal should be emailed to me by Monday, October 11th. If you have any questions, please let me know.

Joel

* * * * *

Joel Schleicher, Associate Principal
Red River High School
2211 17th Avenue South
Grand Forks, ND 58201
(701) 746-2407 ext. 802 (school)
(701) 215-2606 (cell)

Appendix E

Grand Forks Public Schools Policy 2130
on Conducting Research

Policy 2130

ADMINISTRATION

Research

Educational

The Grand Forks School Board recognizes that systematic study of instructional programs can be useful and beneficial. The Board, therefore, encourages well designed educational research projects within the district.

The Board, while recognizing the value of educational research, also wishes to protect students, parents, and staff from harassment; invasion of privacy; and physical, social, and educational injury. Consequently, the Board requires that all research proposals be screened by the Assistant Superintendent for Teaching and Learning in order to ensure that the proposed research has potential value for the district and is consistent with district philosophies, legal obligations, and standards of good scholarship.

Written approval must be provided to researchers before any project can begin. This policy applies to those research projects not sponsored by the district, as well as those initiated by the district.

Major research projects will not be approved for undergraduate work.

All educational research is conducted through the Assistant Superintendent of Teaching and Learning. Other district administrators or teachers will be asked to participate in screening or supervising projects when appropriate. School Board members will be informed about the nature of projects that have been approved.

Nothing in this policy prevents or discourages teachers and principals from conducting surveys or studies in an effort to analyze student performances or instructional materials. In addition, projects conducted by staff members for graduate study that are limited to the staff members' schools and involve only minor changes in the instructional program require permission of the building principal and the Assistant Superintendent of Teaching and Learning.

Request to Conduct Research

Researchers should secure copies of "Request to Conduct Educational Research" and "Guidelines for Proposals to Conduct Research in the Grand Forks Public Schools" from the Assistant Superintendent of Teaching and Learning. The proposal, the completed request form, and all materials to be used in the project should be submitted to the Assistant Superintendent of Teaching and Learning.

Review of Research Proposals

All research proposals will be reviewed by the Assistant Superintendent of Teaching and Learning for acceptability in the following areas:

1) Benefits to the district
2) Compatibility with the regular instructional program
3) Effect on student, parents, and staff
4) Technical adequacy

Following approval from the Assistant Superintendent of Teaching and Learning, principals will be contacted to determine whether they wish to participate. Four weeks should be allowed for the completion of the process.

Other Research

Requests for research projects that are not specifically education related shall be brought to the School Board for consideration. The School Board intends to limit approval of these types of research because of the priority placed on educational research

Conducting the Research Project
Approved research projects are regarded as contracts. Any deviation from procedures described in the application must be approved by the Assistant Superintendent of Teaching and Learning who originally approved the application. Unapproved procedural changes will be considered reason for termination of the project. All research activities must be completed by April 30. Research activities involving students will not be permitted during May and September.

Documentation
Copies of all project reports (dissertation, thesis, journal article or whatever) and a one-page summary of results must be submitted to the Assistant Superintendent of Teaching and Learning at the conclusion of the research project.

Dissemination
Results of research will be shared with the superintendent's cabinet and with appropriate leadership personnel. At the conclusion of each year, the Assistant Superintendent of Teaching and Learning will submit a summary of all research projects to the superintendent of schools and School Board.

Protection of Student Rights
Student anonymity must be assured in all research. Results that identify individual students must never be publicized and may be shared with teachers only after securing parental permission.

Researchers are required to notify parents by mail prior to the beginning of any approved research project if the project involves activities or testing not normally included in the school's regular instructional program. Parents have the option of excluding their child from the project. If letters of notification are required, all mailing costs will be borne by the researcher.

The Grand Forks School District will notify parents and students annually of their rights under the federal Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupils Rights Amendment (PPRA). This notification will be through parent newsletters and student handbooks.

Policy Adopted: 05/25/76
Policy Amended: 11/22/94, 10/26/00, 11/15/01, 10/28/02, 3/26/07, 3/11/09

Appendix F

Family Educational Rights and Privacy Act (FERPA)

Grand Forks Public Schools
A Great Place to Grow and Learn!

Mission Statement:
To Provide Opportunities for All Students to Develop Their Maximum Potential

Mark Sanford Education Center
PO Box 6000 (58206-6000)
2400 47th Avenue South (58201-3405)
Grand Forks, ND
www.gfschools.org

District Office
Phone: 701.746.2200
Fax: 701.772.7739

Family Educational Rights and Privacy Act

Directory Information

The Family Educational Rights and Privacy Act (FERPA), a Federal law, requires that Grand Forks School District, with certain exceptions, obtain your written consent prior to the disclosure of personally identifiable information from your child's education records. However, the District may disclose appropriately designated "directory information" without written consent, unless you have advised the District to the contrary in accordance with District procedures. The primary purpose of directory information is to allow the District to include this type of information from your child's education records in certain school publications. Examples include:

- A playbill, showing your student's role in a drama production;
- The annual yearbook;
- Honor roll or other recognition lists;
- Graduation programs; and
- Sports activity sheets, such as for wrestling, showing weight and height of team members.

Directory information, which is information that is generally not considered harmful or an invasion of privacy if released, can also be disclosed to outside organizations without a parent's prior written consent. Outside organizations include, but are not limited to, companies that manufacture class rings or publish yearbooks. In addition, two federal laws require local educational agencies (LEAs) receiving assistance under the Elementary and Secondary Education Act of 1965 (ESEA) to provide military recruiters, upon request, with three directory information categories – name, addresses, and telephone listings – unless parents have advised the LEA that they do not want their student's information disclosed without their prior written consent. If you do not want the District to disclose directory information from your child's education records without your prior written consent, you must notify the student's building principal in writing within 30 days of the beginning of the school term or within 30 days of the enrollment date for families new to the District. The Grand Forks School District has designated the following information as directory information:

- Student's name
- Address
- Telephone Number
- Date and place of birth
- Grade Level
- Participation in officially recognized activities and sports
- Weight and height of members of athletic teams
- Degrees and awards received
- Photographs and videotapes

Notification of Rights

The Family Educational Rights and Privacy Act (FERPA) afford parents and students over 18 years of age certain rights with respect to the student's education records. They are:

1. The right to inspect and review the student's education records within 45 days of the day the District receives a request for access. Parents or eligible students should submit to the school principal a written request that identifies the record(s) they wish to inspect. The principal will make arrangements for access and notify the parent or eligible student of the time and place where the records may be inspected.

2. The right to request the amendment of the student's education records that the parent or eligible student believes is inaccurate. Parents or eligible students may ask the District to amend a record that they believe is

Providing Equal Opportunities in Education and Employment

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inaccurate. They should write the school principal, clearly identify the part of the record they want changed, and specify why it is inaccurate.

3. If the District decides not to amend the record as requested by the parent or eligible student, the District will notify the parent or eligible student of the decision and advise them of their right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the parent or eligible student when notified of the right to a hearing.

4. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.

5. One exception which permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the District as an administrator, supervisor, instructor, or support staff member (including health or medical staff and law enforcement unit personnel); a person serving on the School Board; a person or company with whom the District has contracted to perform a special task (such as an attorney, auditor, medical consultant, or therapist); or a parent or student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

6. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

7. Upon request, the District discloses educational records without consent to officials of another school district in which a student seeks or intends to enroll.

8. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the District to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, S.W.
Washington, D.C. 20202-5901

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Appendix G

Pre Survey

Social Studies Survey - Students

1. Social Studies Survey - Fall 2010

This survey is being conducted by the Grand Forks Public Schools Social Studies Steering Committee in order to understand the perceptions of students regarding your social studies class. Your views of social studies teaching and learning are important as we consider the future of social studies in Grand Forks Public Schools. Your participation is appreciated, and your identity and responses will be kept confidential. Please answer all of the questions.

1. What school do you attend?

- ○ Schroeder Middle School
- ○ South Middle School
- ○ Twining Middle School
- ○ Valley Middle School
- ○ Central High School
- ○ Red River High School

2. What is the name of your social studies teacher?

- ○ Mr. Bry
- ○ Mr. Omdahl
- ○ Mr. Jiran
- ○ Mr. Wilber
- ○ Mr. Bisenius
- ○ Teacher A

- ○ Mrs. Slavens
- ○ Mr. Johnson
- ○ Mr. Mord
- ○ Mr. Gorman
- ○ Ms. Demaine
- ○ Teacher B

3. Grade:

- ○ 7th
- ○ 8th
- ○ 9th
- ○ 10th
- ○ 11th
- ○ 12th

4. Gender:

○ Female

○ Male

5. Do you have access to a computer with internet access at home?

○ Yes

○ No

6. What grades do you normally receive at school?

○ Mostly A's

○ Mostly B's

○ Mostly C's

○ Mostly D's

○ Mostly A's and B's

○ Mostly B's and C's

○ Mostly C's and D's

7. In social studies class...

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I am an active participant.	○	○	○	○	○	○
I am focused.	○	○	○	○	○	○
I am interested in what we are learning.	○	○	○	○	○	○
I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	○	○	○	○	○	○
I complete my assignments.	○	○	○	○	○	○
I produce quality work.	○	○	○	○	○	○

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I productively use my class time.	○	○	○	○	○	○
I feel that I would produce higher quality work through the daily use of technology such as a laptop computer.	○	○	○	○	○	○
I am challenged to think critically in class.	○	○	○	○	○	○
I have opportunities to work collaboratively with other students.	○	○	○	○	○	○
the teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	○	○	○	○	○	○
I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	○	○	○	○	○	○

8. Please indicate how often the following take place in your social studies class.

	Never	Less than once a week	Once a week	A few times per week	Daily
take notes	○	○	○	○	○
in class activities such as simulations or games	○	○	○	○	○
research information	○	○	○	○	○

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	Never	Less than once a week	Once a week	A few times per week	Daily
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○
work on assignments in small groups	○	○	○	○	○
teacher lectures	○	○	○	○	○
class discussion/debate	○	○	○	○	○
read from the textbook	○	○	○	○	○
work on worksheets/worksheet packets	○	○	○	○	○
discuss current events	○	○	○	○	○

9. Indicate how often technology is currently used in your social studies class. We use technology (such as computers) in social studies class to...

	Never	Less than once a week	Once a week	A few times a week	Daily
take notes		○	○	○	○

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	Never	Less than once a week	Once a week	A few times a week	Daily
organize information	○	○	○	○	○
research information on the internet	○	○	○	○	○
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○
work on assignments in small groups	○	○	○	○	○
communicate with other students outside of Grand Forks	○	○	○	○	○
explore a topic of my interest	○	○	○	○	○

Done

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Appendix H

Teacher Open-ended Response Questions and Statements

January 10, 2011

What is your mission in teaching social studies?

What are some of your concerns about the netbook pilot in you classroom?

What are you looking forward to with the netbook pilot?

February 1, 2011

Overall, describe the level of integration of the netbook computers in your social studies classroom after the first four weeks?

What have been the challenges? How have you overcome the challenges? Do you need additional assistance to address the challenges?

What have been the highlights? Provide specific examples.

Describe how your teaching has changed.

Describe how student learning has changed.

March 1, 2011

How has student engagement changed?

Are students producing higher quality work (compared to traditional methods) with the n etbook? Why or why not? How?

How have 21st century learning skills increased through the student use of the netbooks?

What are some other ways in which your students have used the netbooks?

Describe your level of implementation of Teach TCI and Learn TCI. What are your initial thoughts? What is really good and what are you still unsure about?

April 7, 2011

Please comment on the following, in conjunction with the introduction of the netbook computers in your classroom, provide some examples, and indicate if you've seen an increase or decrease.

1) student engagement

2) student interest

3) student productivity and efficiency of completing assignments, taking notes, using software to complete projects, etc.

4) students working collaboratively with other students

5) students communicating (presenting)

6) students asking more questions (inquiry based)

7) students having the opportunity to answer more questions

8) students having the opportunity to choose the direction of a project or assignment

9) TCI materials...

10) Anything else that you would like to add...

May 22, 2011

1) Provide a summary (list and describe) some of the most positive aspects of having the netbooks in your classroom for your social studies instruction.

2) Provide a summary (list and describe) some of the challenges of having the netbooks in your classroom for your social studies instruction.

3) After using the netbooks for a semester, how would you envision technology/personal learning devices being a part of our social studies curriculum adoption?

4) Is there anything else that you want to add about the pilot?

5) Are you interested in having the netbooks in your classroom next school year?

Appendix I

Post Survey – Pilot

Social Studies Survey - Spring 2011 NETBOOK   Exit this survey

1. Social Studies Survey - Spring 2011

This survey is being conducted by the Grand Forks Public Schools Social Studies Steering Committee in order to understand the perceptions of students regarding your social studies class. Your views of social studies teaching and learning are important as we consider the future of social studies in Grand Forks Public Schools. Your participation is appreciated, and your identity and responses will be kept confidential. Please answer all of the questions.

1. What school do you attend?

- ○ Schroeder Middle School
- ○ South Middle School
- ○ Valley Middle School
- ○ Central High School
- ○ Red River High School

2. What is the name of your current social studies teacher?

- ○ Mr. Bry
- ○ Mr. Omdahl
- ○ Mr. Jiran
- ○ Mr. Wilber
- ○ Mr. Bisenius

3. Grade:

- ○ 7th
- ○ 8th
- ○ 9th
- ○ 10th
- ○ 11th
- ○ 12th

4. Gender:

- ○ Female
- ○ Male

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5. Do you have access to a computer with internet access at home?

- ◯ Yes
- ◯ No

6. What grades do you normally receive at school?

- ◯ Mostly A's
- ◯ Mostly B's
- ◯ Mostly C's
- ◯ Mostly D's
- ◯ Mostly A's and B's
- ◯ Mostly B's and C's
- ◯ Mostly C's and D's

7. In social studies class...

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I am an active participant.	◯	◯	◯	◯	◯	◯
I am focused.	◯	◯	◯	◯	◯	◯
I am interested in what we are learning.	◯	◯	◯	◯	◯	◯
I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	◯	◯	◯	◯	◯	◯
I complete my assignments.	◯	◯	◯	◯	◯	◯
I produce quality work.	◯	◯	◯	◯	◯	◯
I productively use my class time.	◯	◯	◯	◯	◯	◯
I feel that I would produce higher quality work through	◯	◯	◯	◯	◯	◯

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	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
the daily use of technology such as a laptop computer.						
I am challenged to think critically in class.	○	○	○	○	○	○
I have opportunities to work collaboratively with other students.	○	○	○	○	○	○
the teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	○	○	○	○	○	○
I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	○	○	○	○	○	○

8. Please indicate how often the following take place in your social studies class during the past semester.

	Never	Less than once a week	Once a week	A few times per week	Daily
take notes	○	○	○	○	○
in class activities such as simulations or games	○	○	○	○	○
research information	○	○	○	○	○
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○

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	Never	Less than once a week	Once a week	A few times per week	Daily
work on assignments in small groups	○	○	○	○	○
teacher lectures	○	○	○	○	○
class discussion/debate	○	○	○	○	○
read from the textbook	○	○	○	○	○
work on worksheets/worksheet packets	○	○	○	○	○
discuss current events	○	○	○	○	○

9. Indicate how often technology is currently used in your social studies class. We use technology (such as computers) in social studies class to...

	Never	Less than once a week	Once a week	A few times a week	Daily
take notes	○	○	○	○	○
organize information	○	○	○	○	○
research information on the internet	○	○	○	○	○
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○
work on assignments in small groups	○	○	○	○	○
communicate with other students outside of Grand Forks	○	○	○	○	○
explore a topic of my interest	○	○	○	○	○

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10. Imagine the best possible learning environment for social studies for you personally. Rate the degree which the following instructional method engage you.

	Not at all	A little	Some	Very much
Projects and lessons involving technology	○	○	○	○
Teacher lecture	○	○	○	○
Discussion and debate	○	○	○	○
Individual reading	○	○	○	○
Writing projects	○	○	○	○
Group projects	○	○	○	○
Presentations	○	○	○	○
Role plays	○	○	○	○
Art and drama	○	○	○	○

11. Please describe, in detail, both positive and negative aspects of using the netbooks in your social studies class this semester.

Done

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Appendix J

Post Survey – Control

Social Studies Survey - Spring 2011 NON NETBOOK

Exit this survey

1. Social Studies Survey - Spring 2011

This survey is being conducted by the Grand Forks Public Schools Social Studies Steering Committee in order to understand the perceptions of students regarding your social studies class. Your views of social studies teaching and learning are important as we consider the future of social studies in Grand Forks Public Schools. Your participation is appreciated, and your identity and responses will be kept confidential. Please answer all of the questions.

1. What school do you attend?

- Schroeder Middle School
- South Middle School
- Valley Middle School
- Central High School
- Red River High School

2. What is the name of your current social studies teacher?

- Mrs. Slavens
- Mr. Johnson
- Mr. Mord
- Mr. Gorman
- Ms. Demaine

3. Grade:

- 7th
- 8th
- 9th
- 10th
- 11th
- 12th

4. Gender:

- Female
- Male

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5. Do you have access to a computer with internet access at home?

- ○ Yes
- ○ No

6. What grades do you normally receive at school?

- ○ Mostly A's
- ○ Mostly B's
- ○ Mostly C's
- ○ Mostly D's
- ○ Mostly A's and B's
- ○ Mostly B's and C's
- ○ Mostly C's and D's

7. In social studies class...

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I am an active participant.	○	○	○	○	○	○
I am focused.	○	○	○	○	○	○
I am interested in what we are learning.	○	○	○	○	○	○
I feel that I would be more engaged in class through the daily use of technology such as a laptop computer.	○	○	○	○	○	○
I complete my assignments.	○	○	○	○	○	○
I produce quality work.	○	○	○	○	○	○
I productively use my class time.	○	○	○	○	○	○
I feel that I would produce higher quality work through	○	○	○	○	○	○

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	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
the daily use of technology such as a laptop computer.						
I am challenged to think critically in class.	○	○	○	○	○	○
I have opportunities to work collaboratively with other students.	○	○	○	○	○	○
the teacher presents the curriculum (people, places, dates, concepts, events, etc.) in a way in which I am able to easily learn.	○	○	○	○	○	○
I feel that I could learn better through the daily use of technology such as a laptop computer rather than a textbook.	○	○	○	○	○	○

8. Please indicate how often the following take place in your social studies class during the past semester.

	Never	Less than once a week	Once a week	A few times per week	Daily
take notes	○	○	○	○	○
in class activities such as simulations or games	○	○	○	○	○
research information	○	○	○	○	○
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○

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	Never	Less than once a week	Once a week	A few times per week	Daily
work on assignments in small groups	○	○	○	○	○
teacher lectures	○	○	○	○	○
class discussion/debate	○	○	○	○	○
read from the textbook	○	○	○	○	○
work on worksheets/worksheet packets	○	○	○	○	○
discuss current events	○	○	○	○	○

9. Indicate how often technology is currently used in your social studies class. We use technology (such as computers) in social studies class to...

	Never	Less than once a week	Once a week	A few times a week	Daily
take notes	○	○	○	○	○
organize information	○	○	○	○	○
research information on the internet	○	○	○	○	○
take quizzes/tests/assessments	○	○	○	○	○
create presentations	○	○	○	○	○
complete projects	○	○	○	○	○
work on assignments in small groups	○	○	○	○	○
communicate with other students outside of Grand Forks	○	○	○	○	○
explore a topic of my interest	○	○	○	○	○

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10. Imagine the best possible learning environment for social studies for you personally. Rate the degree to which the following instructional methods engage you.

	Not at all	A little	Some	Very much
Projects and lessons involving technology	○	○	○	○
Teacher lecture	○	○	○	○
Discussion and debate	○	○	○	○
Individual reading	○	○	○	○
Writing projects	○	○	○	○
Group projects	○	○	○	○
Presentations	○	○	○	○
Role plays	○	○	○	○
Art and drama	○	○	○	○

Done

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Appendix K

Concept Map

**IMPACT OF NETBOOK COMPUTERS ON ONE DISTRICT'S
SOCIAL STUDIES CURRICULUM**

Qualitative data were obtained from classroom observations, pilot student responses to an open-ended question/statement, and teacher responses to open-ended questions/statement based on the researcher's observation field notes, the words of students' written statements, and teachers' written responses. Codes emerged within the constructs and categories of engagement, productivity, learning, and technology.

CONSTRUCTS and CATEGORIES

Learning	Productivity	Engagement	Technology

CODES

Learning	Productivity	Engagement	Technology
learning	saving assignments, Google Docs	focused	up to date
textbooks	useful, helpful	interested	accessibility
Information, internet, research	organization	engaged	easy to use
collaboration	complete assignments	off task social media	fun
projects & presentations	typing vs. writing	off task online surfing/games	the netbook unit
global connections & current events	get work done faster	bored with netbooks	anecdotal praise
	inconvenient		use less paper
	prefer paper-pencil-textbook		internet and connectivity issues
			confusing to use
			technical Issues including the operating system and software

Concepts
1. Students and teachers encountered both positive and negative aspects throughout the netbook pilot.
2. Students listed more positive comments in the post-survey compared to negative comments, even after being prompted to list both positive and negative aspects of using the netbooks.
3. Students identified the netbooks most impacted their learning and productivity.

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