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IMPACT OF THE LIVING HISTORY ONLINE PROJECT ON STUDENTS' COMPUTER USE, SKILLS, ATTITUDES TOWARD COMPUTER TECHNOLOGY AND HISTORY LEARNING IN FOUR WESTERN MASSACHUSETTS PUBLIC SCHOOLS

A Dissertation Presented

by

WEIJIA LI

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

May 2004

School of Education

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IMPACT OF THE LIVING HISTORY ONLINE PROJECT ON STUDENTS' COMPUTER USE, SKILLS, ATTITUDES TOWARD COMPUTER TECHNOLOGY AND HISTORY LEARNING IN FOUR WESTERN MASSACHUSETTS PUBLIC SCHOOLS

A Dissertation Presented

by

WEIJIA LI

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DEDICATION

To my loving parents, for making it possible to embark on this journey.

To my very special daughter, for making it possible to complete it.

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I would like to express my gratitude to my advisor, Dr. Robert Maloy, the members of my committee, Professor Haim Gunner and Dr. Mei-Yau Shih, for their guidance, support, and thoughtful insights throughout my doctorate program.

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ABSTRACT

IMPACT OF THE LIVING HISTORY ONLINE PROJECT ON STUDENTS' COMPUTER USE, SKILLS, ATTITUDES TOWARD COMPUTER TECHNOLOGY AND HISTORY LEARNING IN FOUR WESTERN MASSACHUSETTS PUBLIC SCHOOLS

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This study examined the impact of a local history project on students' computer use, skills, attitudes toward computer technology and history learning. The variables of gender, grade level, etc. were also investigated. This one-year project integrated computer technology into history curriculum using primary sources. The participants were 64 students from four Western Massachusetts public schools.

The Likert scale pre and post surveys were used to gather quantitative data as a main research method. Class observations and informal interviews were conducted for qualitative data as supplementary information for the research. To analyze the pre-post differences at the item level, approximation to binomial distribution was applied. To analyze the data at the aggregate level, One-way ANOVA, a univariate analysis of variance tests was employed.

The data results showed significant differences in students' computer use and

computer skills between the pre and post surveys. However, the data didn't show significant differences in students' attitudes towards computer technology and history learning. The reason for this may be due to the fact that the students already had positive attitudes prior to the project.

The trend for computer skills indicated that as girls got older their skill level went up, but as boys got older, their skill level went down. The same trend was also reflected in students' attitudes toward computer technology. As for students' attitudes toward history learning, the older students had more positive attitudes than the younger students.

The qualitative data also indicate the positive impact of the project on student learning. Most of the students "enjoyed working on the project" and believed "computer technology was useful". Many students commented that they "learned not only the local history, but also computer technology", and they "learned much more from researching on the Internet than from the textbook". However, the biggest challenge for the students in doing this project seemed to be teamwork, and some students had difficulty cooperating with other people in the group.

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CHAPTER 1

INTRODUCTION

This chapter provides a general description of the study including statement of the problem, background, purpose, research questions, significance, limitations and definition of terms.

The recent U.S. Department of Education statistics concerning the integration of computer technology and the Internet showed that nearly 90% of schools had the ability to support online initiatives (Berson 2001). Other data on the proliferation of computers in the classrooms and at student homes also served to illustrate the increasingly important role such technology plays in schools and society. Gigantic strides have been made with the integration of computer technology in teaching and learning. Classrooms no longer consist of quiet rows of passive students with the teacher as the center of attention; rather social and active settings are provided that are multidisplinary with many paths to progress in an information age. The world is as close as the Internet connections on the computer screen. Students are learning how to produce information and messages themselves, rather than just absorbing information. Teachers, students, and parents are learning together. Information is processed and made relevant to everyday lives of students as a key factor in teaching and learning process.

The introduction of computer technology into the classroom has changed the landscape of teaching and learning for teachers and students (Hawisher, LeBlanc, Moran, & Selfe, 1996). Wilson (2000) said, "In order to educate students to be life-long learners and successful contributors to the new global market, educators must

change the way they teach and the way students learn" (p. 387). At the same time Wilson also emphasized, "If we want to help students achieve a high level of competency and competitiveness, we have no choice but to make computer technology an integrated tool in the learning process" (p. 387).

Computer technology has greatly enhanced teaching and learning in public schools. History is one of the subject matters that have received great benefit (Cantu and Warren, 2003). During the past century, history education underwent a tremendous transformation. There is no doubt that the greatest change came about in response to the introduction of computer technology in the classroom. As the integration of computer technology into the history teaching and learning environment is essential in preparing students for life in the information age, two critical questions remain: How extensive are the impacts of computer technology on history education? What are the reactions of the students toward history learning in the digitally connected classrooms?

Statement of the Problem

It is acknowledged that successful use of computer technology in the classroom is dependent on positive teacher attitudes toward computers, and successful classroom practice also requires fostering positive perceptions of computer technology among students (Knezek, Miyashita, & Sakamoto, 1993). To prepare our children for a rapidly changing world, it is, therefore, very important to explore students' computer use, skills and their attitudes toward computer technology as well as toward the subject matter. Many variables may affect students' attitudes,

such as the differences in gender and grade level, equal access to computers at home and English as the first language. All these variables deserve special attention in studying students' attitudes toward computer technology.

Background of the Study

The Living History Online Project was an attempt to investigate the impact of computer technology on student history learning. It began as a federal "Enhancing Education Through Technology Integration" grant, funded by the Massachusetts Department of Education. The project integrated computer technology including Internet, web design, digital image, etc. into history learning. Primary sources were used instead of the traditional textbooks and teacher lecturing. This history and technology infused project fits local curriculum guidelines and Massachusetts State frameworks in history and instructional technology. It was a year-long (September 2002 to August 2003) collaboration among four Western Massachusetts public schools, the Center for Computer-Based Instructional Technology (CCBIT) at the University of Massachusetts, Amherst, the local history museums, and local libraries. The technology coordinators at the four public schools worked with curriculum and technology specialists at CCBIT to bring history to the students using computer technology and primary sources.

The subjects of the research included 64 students of three different grades (4th, 5th and 8th) from four public schools in Amherst, Pelham, Hatfield and Springfield cities and towns in Western Massachusetts. Four classroom teachers and four computer teachers also participated in the study. Each participating class in the

Living History Online Project chose a local historic site or event to investigate. These projects included: Shays' Rebellion in Amherst, The Town Hall of Pelham, The Study of Wills in Hatfield, and the Underground Railroad in Springfield, Massachusetts. The class was divided into small groups of three or four students and each group worked on one section of the history project. The students first plunged into research using the scanned primary documents supplied by the special collections at the local libraries, the Internet and the website with related links created by CCBIT history specialists. Later, the students were given opportunities to take field trips to the local historical sites, history museums, and town halls to learn more about their research projects. They interviewed people with knowledge of their projects, and they took digital images and scanned information of primary sources using the computer technology devices funded by the grant. Following an inquiry-based constructivist learning approach, each class took its project in the direction provided by the available resources. After completing their research, students learned a web-authoring program, FrontPage, with the help of the computer teachers and CCBIT computer experts. Subsequently, each class created a website to showcase its local history project. Their websites were later linked to the school district websites.

The researcher used the pre and post surveys (Appendix B) for quantitative data collection. The survey items consisted of five categories: computer use, computer skills, attitudes toward computer technology and history learning. The last part of the survey was on demographic information of the subjects such as gender, grade level, access to computer and the influence of the language. The quantitative data obtained from the pre and post surveys were analyzed with the help of the

Statistical Package for the Social Sciences (SPSS). The researcher employed the instruments of interview, class observation and the participants' reflection on the project for qualitative data collection. The qualitative data were used to provide supplementary information and explanations for the changes reflected in the quantitative data between the pre and post surveys.

Purpose of the Study

The purpose of this research was to study the impact of the Living History Online Project on students' computer use, skills and attitudes toward computer technology and history learning. Special attention was placed on gender and grade level differences. In addition, equal access to computer at home and English as the first language were also examined.

Research Questions

1. What impact does the Living History Online Project have on students' computer use?
2. What impact does the Living History Online Project have on students' computer skills?
3. What impact does the Living History Online Project have on students' attitudes toward computer technology?
4. What impact does the Living History Online Project have on students' attitudes toward history learning?

5. Does the Living History Online Project have a different impact on male and female students in computer use, skills and attitudes toward computer technology and history learning?
6. Does the Living History Online Project have a different impact on grade levels in computer use, skills and attitudes toward computer technology and history learning?
7. How does having a computer at home affect the students' computer use, skills and attitudes toward computer technology and history learning?
8. Does English as the first language play a role in students' computer use, skills and attitudes toward computer technology and history learning?

Significance of the Study

Previous research studies have been conducted on students' attitudes toward computer technology in reading, writing and math, but not much data has been collected, as the Living History Online Project did, on a local history project using computer technology and primary sources.

The research results of this study were useful in evaluating the effectiveness of the integration of computer technology into history curriculum.

The students' local history websites for this study provide valuable resources for future researchers who are interested in the similar topics. The websites can be inspirations for students and teachers in history learning and teaching.

The study provided important information to educational administrators and the many corporations that spend thousands of dollars each year on educational

programs. The results of the study could assist educational administrators to assess the effectiveness of the programs and, therefore, make better decisions on the allocation of educational funds.

Limitations of the Study

The primary limitation was that the students were not randomly selected and the objective of the study was only to survey the students at the four particular public schools that received the grant. Therefore, this study is limited in the same way that many such studies are, in that the conclusions may not be generalizable beyond the four specific schools in the study.

Second, the characteristics of the subjects must be recognized as a possible limiting variable. The differences with regard to ethnicity, gender, age, culture, personality, and experience can create classroom interactions which may have influenced the outcomes of the study. Different group of subjects could have different results. Also, this study had no control over the external classroom learning environments available to the students. Nor did it have control over learners' prior skills with computers.

Third, the subject matter of the project studied is limited to history and the results of this study cannot be generalized to other subject matters.

Finally, the results from this study may have been influenced by the duration of the research. The Living History Online Project started in September 2002, but the data was collected from January through June of one academic semester. The six month period may not have been a sufficient amount of time for effects to have

occurred. Due to the newness of the technology involved, there were no longitudinal studies of the effects of computer technology on attitudes and achievement. The Apple Classrooms of Tomorrow (ACOT) project offered some evidence of long-term effects and suggested that the changes possible with computers would be slow. Possibly this study would show greater effects on student attitudes over a longer time period.

Definition of Terms

Computer attitude: an internal state that affects an individual's choice of action toward the computer.

Constructivist learning approach: knowledge is constructed by an individual based on his/her prior experience rather than processed from information received from an external source. In this process, the student assumes the role of the producer rather than the consumer of information. The teacher becomes the guide and facilitator of learning and a member of a learning community rather than the director of instruction.

Digital divide: the disparities in access to computers and the Internet across various demographic groups.

Likert-scale survey: survey that asks bipolar questions and requires answers ranging on a spectrum from strongly agree to strongly disagree.

Multimedia: the integration of media objects such as text, graphics, video, animation, and sound to represent and convey information.

Primary sources: sources created at the time of the event that provides firsthand evidence of historical events. They are generally unpublished materials such as manuscripts, photographs, maps, artifacts, audio and video recordings, postcards, posters, oral histories, and even the living memories of witnesses.

Local history: the study of a particular region's past. The region in question tends to be geographically small. It is usually a city, town, or county. Local history concerns itself with many different subjects within that area such as factual events, cultural heritage, genealogy and folklore.

CHAPTER 2

LITERATURE REVIEW

The purpose of this literature review is to provide information from previous research studies related to the topic of this study. The literature review starts by addressing the development of computer technology and changes in computer technology research. It is followed by the impact of educational reform on teaching and learning. Next, integrating computer technology with a constructivist learning approach is presented. Then the current situation in history education and the advantages of using primary sources are explored. Finally, the attitudes toward computer technology and gender differences in computer technology are discussed.

The Development of Computer Technology

Computer technology has infiltrated every aspect of society and influenced everyday life dramatically in the past few decades. This is especially true in education. As a result, much attention has been paid to the impact of computer technology on teaching and learning since, according to Wetzel (1999), today's students are the first generation that will be expected to have skills in computer technology for future success.

It is difficult to keep track of the development of computer technology use in schools. As Gatewood and Conrad (1997) described, computer technology use in the school setting underwent multiple waves. The first wave took place in the early 1980s, when a small number of personal computers began to be used in classrooms to teach students programming languages. The second wave found computers

arranged in laboratory settings. Students used computers for writing and mathematics using word processing and spreadsheet programs. The third wave came in the early 1990s, when students began to use software to access electronically reference materials such as CD-ROM that contained text, pictures, sound and video. Around the mid of 1990s, the fourth wave of technology started. Heaveside and Parris (1995) reported that by 1995, almost every school in the United States had computers and 75% of them had network capabilities. The figures have increased even more today. Students of all ages are now using computers to do school work and to send electronic mail. They use the Internet for research and entertainment.

A similar description is by Starr (1996), who defined three phases of computer technology in his article "Computing our Way to Educational Reform", presented at the MIT Media Laboratory in June 1996. The first phase lasted through the early 1980s and focused on the development of computer-assisted instruction and the teaching of computer programming. The second phase began in the early 1980s with the spread of personal computers, graphical user interfaces and general software applications. The third phase began in the 1990s and was characterized by the incorporation of multimedia and the explosive growth of the Internet and the World Wide Web.

This led to the transformation of computer technology from a segregated activity into a blended part of the everyday work, school and home environment (Starr, 1996). This movement into the third phase of computer technology, as defined by Starr, partnered with the movement toward more constructivist learning approach used by teachers. This change in the learning process was

supported by the availability of more authentic means to access and process information. Starr spoke of a growing body of evidence suggesting the introduction of computer technology into the classrooms should move toward more emphasis on projects where teachers would guide the students in their own learning.

Changes in Computer Technology Research

Along with the development of computer technology, the research focus on computer technology has gone through many changes, too. Maddux (1993) categorized the researches from the late 1970s to the 1990s into three chronological and overlapping stages.

Stage One research was based on the idea that exposure to computers would enhance student learning. Experimental research was rare and reports were limited to position papers and personal testimonials. The computer literacy movement had its origin during this era when the focus was on students gaining a familiarity with computers. This usually meant some kind of programming, as software was scarce and expensive. The emphasis during this period was on placing more computers in the public schools, with the belief that availability of more hardware would benefit teaching and learning. Toward the end of Stage One, educators started to see that it was not necessary for every child to have skills in programming in order to be employable. Programming was not the answer to keeping the nation from falling behind the world in computer technology developments.

The research methodology used during Stage Two focused on experimental and control groups, with the experimental group using the designated computer application. Dependent variables were checked to measure student learning after a determined period of time. Learning and teaching variables had little or no consideration in the research design. Exposure to computers and programming strategies was believed to be all that was necessary in order for the student to be a better problem solver regardless of who was taught and how they were taught.

Research with word processing seemed to keep the research study designs stuck in Stage Two longer than that using programming software as seen in Stage One research designs. These studies were often disappointing because they focused on the belief that student writing would improve automatically if students were only taught word processing (Maddux, 1993). There was little consideration in these studies for the level of the learner, type of hardware, choice of software and instructional processes used for learning the word processing software in relation to learning the writing process. These disappointing results helped fuel negative thinking about the impact of computer technology in the learning environment.

In Stage Three, as defined by Maddux (1993), the research questions moved to consider how the learner and learning variables interact with teaching variables when using defined hardware and software. These studies produced more encouraging results and reflected the impact of computer technology on student learning. The research studies from Stage Three were designed to measure student learning using various computer technologies when defined methodological practices were implemented.

Research projects designed to meet the Stage Three guidelines are now providing educators with positive information on when, where and how to implement computer technology effectively in the classroom. Despite the tremendous potential of learning computer technology in the classroom, it became more and more clear that the mere availability of computers, software, video images, sound and unlimited text, were not powerful in and of themselves. According to Johnson, R.T. (1993), computer technology need to be incorporated into the classroom using processes and techniques that support appropriate learning and teaching strategies.

The integration of computer technology into the instructional environment can fundamentally change the nature of instruction in the classroom. Change is brought about by the interaction among students, teachers and information. As stated by Waxman & Bright (1993) that information can be obtained, manipulated and displayed in a variety of new and different ways because of computer technology.

Jones, Valdez, Nowakowski, and Rasmussen (1994) found current research studies built a strong consensus regarding the importance of engaged, meaningful learning and collaboration involving challenging authentic tasks. These research studies that focus on learning were influencing and being influenced by the understanding of computer technology as a tool for learning and communication. This caused focus on new criteria for technology performance and for assessment of student learning.

Jonassen, Campbell, and Davidson (1994) stated that the focus of research should be less on the characteristics and attributes of the media for conveying the knowledge and more on the needs of the learner involved with the knowledge

building. The media attributes should not be compared to the instructional methods, but rather the media should be seen supporting, not controlling the learning process.

Research processes measuring the effectiveness of computer technology on student learning have evolved quickly as computer technology has changed. The research studies have also changed to reflect the growing attention given to the design of the learning environment, instructional processes used and the individual learner.

The Impact of Educational Reform on Teaching and Learning

To cope with the fast developing era of technology, the existing educational system must change, too. Dr. Andrew R. Molnar (1997) from the National Science Foundation saw three demands from society that caused the desire to push for changes in education. First, there was a change in the national philosophy to move from providing mass education for many children to providing education for all children. Second, it was commonly accepted that children were being prepared for a new type of society that was not yet defined and did not yet exist. Third, as all were living longer, formal education would have to extend beyond high school and even college to provide for the multiple career changes possible.

Dr Molnar (1997) also wrote about the importance of the creation of an information-rich society enhanced with availability of radio, television, film and computers. As more was being discovered, explored, described, and analyzed, society was able to have rapid access to volumes of information in multiple media formats. Schools were no longer the center of information and had to compete with

these new technologies for the attention of the students. According to Molnar, this set of events during the past forty plus years provided the need to question and change our education system.

In 1989, President George Bush invited the fifty governors to attend an Education Summit to discuss the current condition of education. They focused the attention of the public on possible solutions by establishing six National Education Goals, which were implemented as the national strategy in 1991 to be accomplished by the year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matters, including English, mathematics, science, foreign languages, civics and government, economics, art, history, and geography.
4. U.S. students will be first in the world in science and math achievement.
5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning (p. 5).

This was only a first step in the direction of desired educational reform. Technology and appropriate instructional practices were recommended as appropriate means to meet

each of the goals. The intent was to prepare the nation's youth while providing them with the highest possible quality-learning environment that was also challenging and safe.

The U.S. Department of Labor organized education and business leaders to issue another major report to the education community titled "What Work Requires of Schools: A SCANS Report for America 2000" (1991). This report is referenced frequently as schools and districts build technology plans that will be positively supported by the business communities. The report identified five competency skills as follows:

1. Resources: Identifies, organizes, plans and allocates resources,
2. Interpersonal: Works with others,
3. Information: Acquires and uses information,
4. Systems: Understands complex interrelationships,
5. Technology: Works with a variety of technologies (p.5).

This list of desired competency skills is closely connected to the advantages presented by constructivist strategies that are necessary to effectively access and process large amounts of information while working in groups or teams as often found in the work environment. According to Radlick (1994), "the necessary skills for the new century should be independent thinking, continual learning, and collaboration as a learning community, the ability to filter information and use technology tools" (p.3). The intention of this skill identification process was to assist students to meet the ever-increasing global competitiveness and rapid social and technological changes they would face in the information age.

During this same time, the continued focus on school reform encouraged the creation of learning environments based on instructional strategies that provided students with the abilities to access and process information from the ever-increasing body of knowledge in the world. The focus remained on improving the student learning environment to better match the needs of work and the unknowns of the next century (Goodlad, 1992). These implementation processes continued to support and promote the appropriate integration of computer technology in student-centered constructivist learning environments. As Ray (1992) stated:

> The wise use of computer technology is fundamental to the restructuring of schools. The existing system of education was designed to meet the need of the 19th century and early 20th century when the majority of our needs were to provide for the agricultural and industrial requirements of work. This system is no longer appropriate as the single method in this time of massive information (p.11).

There was a strong demand for instructional changes. In his call to use a total system redesign for education, Banathy (1994) suggested the following changes:

1. From a focus on instruction to a focus on learning.
2. From teachers who present instruction to people who guide learning.
3. From students who compete for grades to cooperating learning teams.
4. From setting minimum standards to nurturing the learner's full potential.
5. From reliance on textbooks to experiential learning and the use of appropriate technologies.

6. From fragmented subject matters to learning arrangements situated and grounded in real-life experiences that are relevant and important to learners (p. 8).

It is important to point out that Banathy's suggestions, aimed at those interested in meeting the challenges of school reform, were nearly identical to the constructivist learning approach.

The Clinton administration moved schools rapidly to increase the amount of technology and the connectivity potential. In 1996, President Clinton raised the challenges to America's schools in "the President's Educational Technology Initiative":

1. Modern computers and learning devices will be accessible to every student.
2. Classrooms will be connected to one another and to the outside world.
3. Educational software will be an integral part of the curriculum and as engaging as the best video game.
4. Teachers will be ready to use and teach with technology.

In his Call to Action for American Education in the 21st Century (State of the Union Address, 1997), President Clinton continued to support a clear priority for quality education. He said:

> Our schools must now prepare for a transition as dramatic as the move from an agrarian to an industrial economy one hundred years ago. We must connect every classroom and library to the Internet by the year 2000, so that all children have access to the best sources of information in the world (p. 6).

In response to this challenge, the CEO Forum on Education and Technology presented a report to the public in 1997. This report focused the shared understanding of the issues and realities associated with the use of computer technology in education today. The opening statement of the report titled "School Technology and Readiness Report-From Pillars to Progress" stated:

> To thrive in today's world and tomorrow's work place, America's students must learn how to learn, learn how to think and have a solid understanding of how technology works and what it can do. American schools must, therefore, provide students with the opportunity to combine the best of traditional learning with the unprecedented opportunities technology offers (CEO Forum, 1997).

Throughout the educational reform movement instructional process were commonly referenced as student-centered and authentic. Kimble (1998) pointed out that these defined learning needs of the educational reform align with the research and practice of the constructivist learning approach environment. In the constructivist learning environments, students have multi-sensory stimulation and they work together on collaborative projects, exchanging information in active learning situations. The CEO Forum Year 2: School Technology and Readiness Report "Professional Development: A Link to Better Learning" (1999) brought the constructivist learning approach alive, and made pertinent connections between technology and education: "when used appropriately, technology can be an effective tool for promoting practices shown to improve student achievement and school performance" (p. 5).

Computer Technology and Constructivist Learning Approach

In all the major calls for educational reform, the importance and value of the integration of computer technology in an authentic or constructivist learning environment was repeated again and again. The reason for this is that the constructivist learning approach offers the best opportunity for the application of computer technology to education (Shaw et al., 1999).

What exactly is constructivist learning approach? In his book *the Art of Case Study Research* (1995), Stake explained that "constructivism is a philosophy of cognitive learning and thinking with inquiry and exploration. It is a belief that knowledge is made up largely of social interpretations rather than awareness of an external reality" (p. 66). According to Dowling (1996), "the constructivist paradigm of criticism, with an alternative view of reality, looks at the whole first and then the parts. Educational constructivism is demonstrated by a conceptual understanding of material as application is made to projects often in the area of technology with primary source materials" (p. 12).

Constructivism, as also stated by Jonassen (1991), is based on the belief that reality is in the mind of the individual who constructs or interprets reality based on previous experiences. It is constructed from experiences, mental structures and beliefs. The external world is conceived differently by each individual based upon a unique set of experiences and beliefs about those experiences. Wiburg states that teaching with computer technology leads to a more child-centered and active learning environment (as cited in Stegall, 1998). The computer can assist the teacher in offering individualized learning to all students (Carvin, 1999). Denzin (1994)

explains that knowledge and truth are the result of the perspective of the learner: "Knowledge and truth are created, not discovered by the mind" (p. 25).

Constructivist theory has given rise to an approach to education that places great involvement by the student. Learning takes place in a realistic context and requires the student to be self-directed (Brooks & Brooks, 1999). Activities are designed to be driven by the students' own curiosity. Emphasis is on the practical functions of knowledge, rather than the realistic view.

The constructivist learning environment as described by Wilson (1995) is "a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities" (p. 27). This learning environment, based on the constructivist learning philosophy that was evolved during the 1970s and 1980s, has its foundations in cognitive learning psychology (Jonassen, Peck, & Wilson, 1999). It is rooted mainly in the works of Dewey (1896), Piaget (1952), Bruner (1985), Vygotsky (1978), Papert (1980) and Roblyer & Edwards, (2000).

The constructivist learning model is based on the concept that knowledge is constructed by an individual based on his/her prior experience rather than processed from information received from an external source. In this process, the student assumes the role of the producer rather than the consumer of information. The teacher becomes the guide and facilitator of learning and a member of a learning community rather than the director of instruction. The students are given significant freedom to set their own learning goals and attain these goals themselves.

Constructivists emphasize learning as a social and collaborative endeavor as well as problem-solving of realistic and authentic tasks. Thus, instructions focus on assisting the learners to develop learning and thinking strategies in the subject domain, that is, learning "how to learn" rather than how much is learned. From a constructivist view, students must be provided with a rich learning environment. The computer with its capability of processing and integrating the various media elements such as text, graphics, sound, animation, and video is ideally suited to present such a rich learning environment.

Today we continue to struggle to make meaningful new ways of learning and communicating with each other. Piaget's theories also incorporate this view of learning which is subjective and personal. Constructivism holds that learning is anything but passive. A person learning something new brings to that experience all of his/her previous knowledge and present mental patterns. Each new fact or experience is assimilated into a living web of understanding that already exists in that person's mind. As a result, learning is not passive or objective; it is an intensely subjective, personal process and structure that constantly and actively modifies in light of new experiences. Constructivists would argue that, "by definition, a person who is truly passive is incapable of learning" (Wilson; 1994, p. 176). According to Dowling (1996), "the constructivist educational paradigm incorporates many of the cognitive principles embraced by computer science. Together, then, emerging technology with educational theory in an environment of educational reform can support a new model of educational telecommuting" (unpaged). It is this actively

engaged process of learning assisted by the use of computer integrated learning that educators should explore.

Constructivist approaches to education versus the traditional approaches are continually debated as the use of computer technology becomes more widespread in today's classrooms. Dowling (1996) at the Sixth Annual Internet Society Conference made a point of comparing the traditional classroom and the constructivist classroom. She characterized the traditional classroom as the pouring of facts into an empty vessel, the student. The constructivist classroom involves a bigger picture where teachers learn along with students, taking the stand of a guide on the side, rather than the sage on the stage. Dowling refers to Howard Gardner as one of the promoters of a constructivist learning approach that uses primary source materials including those found on the Internet. Dowling felt that it was much easier to incorporate computer technology into a constructivist learning environment: "The constructivist educational paradigm incorporates many of the cognitive principles embraced by computer technology" (Dowling, 1996, unpaged).

In the view of many researchers, computer technology offers constructivist opportunities for cooperative learning and socialization. The real strength of technology in education comes from using the right technology at the right time to meet the right objective. Zehr (1998) cited a research project done by Henry Becker in 1997 in conjunction with the National Science Foundation in which 776 teachers who used computers were surveyed, and at least 70% said that their teaching style had changed in ways Becker called constructivist.

> Teachers were teaching longer projects, giving students more chances for active, out of the seat activities; using more interdisciplinary content; giving students more opportunity to review and revise their work; having students work more in cooperative groups; and being more reflective about teaching goals (p. 41).

According to Neo (2003), "success in creating a constructivist learning environment is dependent on three factors: first, the role that the teacher plays, second, the role the student plays, and third, the use of technology in cultivating this learning environment" (p. 293). Traditionally, the teacher assumed the role of the source of knowledge or the only content expert in the class and taught students with the directed instruction method. In this teacher-centered mode, the teacher is in control of the information and is solely responsible for how much information is to be disseminated to the students, thus rendering the learning mode passive. This traditional "chalk-and-talk" mode of teaching is still widely used, but, currently, there is a move toward creating a constructivist learning environment. Now, in this perspective, the role of the teacher moves away from being the sole expert or dispenser of knowledge and information in the class to becoming a facilitator to the students and a guide to help them achieve their learning objectives. The differentiated instruction method is often applied in a constructivist learning environment.

The role of the student also evolves from being a passive learner to becoming an active participant in the learning process. In this student-centered learning mode, the students must play an active part in their learning and construct their own

knowledge or meaning of what they learn, and learning builds on what learners have already constructed in other contexts. The learners determine how to reach the desired learning outcomes themselves. In other words, students are involved in learning as a process of knowledge construction and not knowledge absorption. This learning process is also knowledge-dependent, that is, the learners use current knowledge to construct new knowledge.

The third factor in this formula is the use of technology in the teaching and learning environment. Technology can be used by the teacher to represent and support his or her educational materials. Introducing technology to the students in the form of a multimedia project can help stimulate their learning process and make them active participants in meeting their learning objectives. By incorporating digital media elements into the project, the students are able to learn better since they use multiple sensory modalities, which would make them more motivated to pay more attention to the information presented and better retain the information. Therefore, multimedia application design offers new insights into the learning process of the designer and forces him or her to represent information and knowledge in a new and innovative way.

The primary goals of our schools should be to master facts, theories, and information, and to develop critical thinking strategies and skills. Students should also develop positive attitudes toward subject areas: be able to use knowledge gained on the job, in the family, community and society, and acquire the psychological well being needed to function in society. A constructivist learning approach at all levels can be used to further achieve all of these aims. Constructivist learning is certainly an

effective and engaging way to teach history. Teachers and students, therefore, should take advantage of the constructivist approach through the use of computer-based programs available in the schools today.

History Learning Using Computer Technology and Primary Sources

According to Cantu and Warren (2003), one of the most common critiques of elementary and secondary school history instruction is that it lacks a critical research focus. It seems that few history teachers do much besides teach the textbook. History classes seldom require students to analyze historical documents. Instead, too many history classes focus on memorization of factual material as their dominant activity.

The problem with memorization exercises is that they do not lend themselves to authentic instruction or assessment. That is, when an emphasis on recall of facts is the predominant classroom activity, students are often not required to engage in tasks that are either meaningful or professionally valid. Memorization also contributes to another common complaint about elementary and secondary history instruction - its dullness. As sociologist James W. Loewen says in the opening sentence of his widely acclaimed *Lies My Teacher Told Me: Everything Your American History Textbook Got Wrong* (1995), "Secondary school students hate history" (p.3). Students typically think of history as not only the most boring but also the most irrelevant subject they take in school. This perception is again directly related to the pedagogical emphasis of most elementary and secondary level history instructors on textbook readings combined with rehearsal of factual material. Students miss out on the potential for interest created by examining the "mysteries" posed by actual historical documents.

Indeed, as Howard Gardner (2000) said, "introducing students to the intellectual heart or experiential soul of the disciplines should be at the center of a truly worthwhile educational experience for all children" (p.18).

During the past century, history teaching underwent a tremendous transformation. Perhaps the greatest change came about in response to the introduction of Internet and World Wide Web in the classroom. As a result, a growing number of students are no longer content to have history fed to them through means of the didactic lecture. Instead, they are beginning to demand that history teachers integrate into their curriculum the wealth of digital historical resources available on the Internet. One of the important reasons for the use of Internet resources for history learning is that it has the potential to provide a conceptual hook that combines pedagogical features most students find quite appealing and engaging, such as computer technology, multimedia components, and student autonomy. It is perhaps this final element, student autonomy, that will prove to be most beneficial in the development of student historical thinking skills. For too long, many teachers have been unwilling to relinquish their role of informational gatekeeper. The Internet, however, is perhaps much more democratic, granting access to more historical resources than ever could have been imagined, all a mere mouse click away.

Another revolution in elementary and secondary history teaching and learning over the past decade is engaging students in primary sources with authentic instruction and assessment (Cantu and Warren, 2003). This effort has resulted in greater emphasis on tasks that are not only more meaningful and professionally valid

but more challenging for students. As stated by Scheurman and Newmann (1998) in the book *Authentic Intellectual Work in Social Studies: Putting Performance before Pedagogy*:

> Authentic achievement requires students to pursue learning exercises that reflect the type of inquiry used in the discipline, show evidence of understanding relationships among the various fields that comprise their learning like history, and develop competencies and culminating exercises that have value beyond the classroom (p. 45).

Of course, until recently nearly all elementary and secondary history teachers could have honestly protested about the limited access to primary sources. For instance, school libraries typically do not collect letters, correspondence, diaries, newspapers, journals, maps, paintings, photos, and other items from various historical periods. All these items are more typically associated with university or research libraries' archival collections. Before the emergence of widespread Internet and World Wide Web access, providing students with primary source materials would have entailed photocopying items from a nearby research library or considerable logistical creativity and use of class time to transport students to larger public libraries, local history museums or county courthouses. Other options for identifying and using primary sources are also problematic. Some history textbooks include primary source vignettes, but these are often more decorative than anything else. Ready-made primary source packets, such as those produced by Jackdaws Publications, are relatively expensive and, of course, cannot cover all possible issues that teachers might like. But "with the explosion of materials available on the World

Wide Web and increasingly widespread Internet access in schools, teachers can no longer legitimately complain about lack of availability of primary source materials" (Fossen, 2000, p. 3).

Historians see the advantages of primary source research without need for explanation, but elementary and secondary school history teachers need to identify the benefits for their students. Students need to develop the historian's critical thinking perspectives, or "habits of mind," that can be acquired only through the systematic analysis of historical materials. As David Kobrin (1996) has outlined in his valuable text, *Beyond the Textbook: Teaching History Using Documents and Primary Sources*, students involved in historical research can learn how to "pose pertinent questions, define problems, analyze relevant information, support their conclusions, and understand their own values" (p. 5). While developing these skills and a more critical perspective, primary research exercises also help students learn to question authority, particularly the typical reliance created by the repetitious use of textbooks and direct instruction by teachers. By helping students pursue primary source analysis and their own construction of history, teachers also can motivate students to become more active learners. In the process of engaging in primary source research, many students become enthusiastic about history rather than being bored by it.

In the 21st century, history teachers are confronted with the complex challenge of preparing the next generation's computer literate and technology-savvy students. With the growing number of computer technology and Internet proficient students, the need for digital pedagogues in history classrooms is growing

exponentially. The digital age that ushered in the 21st century offers a unique opportunity to venture down roads never before taken by teachers in the history of education. Teachers, however, must be willing to take the first step in this process. Without their leadership, the use of computer technology and the Internet in history education will continue to lag far behind other core disciplines and sectors of American society. Therefore, teacher understanding of the role of computer technology in history education is absolutely critical.

It is also important that teachers concentrate intently on providing students with opportunities for developing historical thinking skills and habits of the mind, such as the ability to "read widely and critically in order to recognize the difference between fact and conjecture, between evidence and assertion, and thereby to frame useful questions" (Bradley Commission, 1995, p. 1).

The challenge for teachers, however, is not only to provide the knowledge and conceptual foundation for students to build upon in their study of history, hopefully dispelling many of the myths and historical inaccuracies along the way, but also to engage students in the type of historical inquiry and investigative activities that serve to further their interest and understanding of this critical period. Students are leaving the safety of the academic nest much earlier than before, attempting to fly in the cyber sky and encountering countless historical resources along the way, from the valuable to the dubious. The teachers' goal, therefore, should be to teach them how to fly better in this uncharted electronic environment.

The Living History Online Project, using primary sources and analysis activities, engaged students in active, inquiry-based, and reflective examination of

historical documents. Students who studied history in such instructional activities would not only learn a more authentic brand of history, but they would also become more enthusiastic about learning history in general.

Attitudes toward Computer Technology

Attitudes toward computer technology are complex and multi-dimensional. In general terms, attitudes are "learned predispositions to respond positively or negatively to certain objects, situation, concepts, or persons" (Aiken, 1980, p. 2). In addition, attitudes vary in intensity, with respect to the level of commitment to which the attitudes are held (Fleming & Levie, 1978). According to Zimbardo and Ebbesen (1970) attitudes are thought to have three components: affective, cognitive, and behavioral. The affective component consists of the emotional response or the person's liking of, or evaluation of, some object or person. The cognitive component is associated with a person's knowledge or factual beliefs about an object or person. The behavioral component refers to the person's overt behavior toward the object or person (Thompson, Simonson & Hargrave, 1996).

A few researchers have attempted to evaluate the impact that various computer technology strategies have had on attitude formation, and change among students (Reed & Overbaugh, 1993; Reed & Liu, 1994). Although attitudes are not directly observable, they do act to organize or provide direction to actions and behaviors that are observable (Davis, 1989). Fishbein and Ajzen (1975) suggested that attitudes influenced behavior, including performance. In the Technology Acceptance Model (TAM), Davis (1989) noted that attitudes toward computer use

directly influenced intentions to use the computer and ultimately actual computer use. In addition, Hakkinen (1995) noted that the first experiences with computer technology had strong effects on subsequent attitudes toward computers.

Several researchers have shown that students may display negative attitudinal and affective reactions to computers (Gardner, Young, & Ruth, 1989; Reed & Palumbo, 1988; Reed & Overbaugh, 1993; Reed & Liu, 1994). Lambert (1991) characterized these negative attitudinal reactions as computer aversion. Thompson et al. (1996) noted that although the relationship between attitudes and learning was unclear, students were more likely to remember information, seek new ideas, and continued studying when they reacted favorably to an instructional method and a particular content area. Hence, it is important for educators to be aware of those factors that influence attitudes in one direction or another so that bias may be reduced (Thompson et al., 1996).

Attitudes play an important role in instructional design and implementation. Loyd and Gressard (1984) noted that positive attitudes would increase the prospect for achievement in any academic endeavor, while negative attitudes would make achievement or competency less likely. For some students, these negative attitudes toward computer technology were shown to interfere with personal and career choices (Weil, Rosen, & Wugalter, 1990). Decreasing computer anxiety, then, is an important goal in the educational setting. Whiteside, Lang, and Whiteside (1989) referred to attitudes toward computers as "internal factors" that played a major role in a person's willingness to use computers. The study by Anderson, Hansen, Johnson, and Klassen (1979) indicated that attitudes toward computer technology were

predictive of their adoption. Delcourt and Kinzie (1993) provided evidence that teachers must have positive attitudes about computers before they would embrace computer technology.

The interactions that exist between humans and computers are complex. Attitudes toward computers may differ depending on many factors. Learning style, demographics, previous experience, social support, and various coping strategies are among the variables that must be considered (Hakkinen, 1995). Hence, what one individual may experience as a negative reaction, and resistance to change in one situation, may not be the same for another individual.

Gender Differences

Much of the literature that has been written in the 1980s and early 1990s on the relationship between gender and computer attitudes reported that males had a more positive attitude toward computers than did females (Anderson, 1987; Chen, 1985; Farina, 1991; Johanson, 1985; Merchant & Sullivan, 1983; Nickell & Pinto, 1986; Okebukola, 1993; Rosen, Sears, & Weil, 1987). Johanson (1985) also noted that females tended to express less confidence in working with computers than did males. Miura (1987) found that male students most often viewed the computer and classified its skills as masculine rather than feminine and noted that male students showed a greater interest in computers and their use than did females.

Giacquinta, Bauer and Levin (1993) found that boys conceptualized computers differently than girls. Boys were more likely to play games, to program and to see the computer as a playful, recreational toy. Girls tended to view the

computer as a tool, a means to accomplish a task such as work processing or other clerical duties. Boys gravitated toward open-ended play while girls favored experiences that repeated patterns they were familiar with and for which they already knew the outcome. Kirkpatrick and Cuban (1998) claimed:

> In comparison with males, females do not take as many computer courses at school; they do not spend as many hours on computers at home, at computer camps, or in afterschool computer centers, and they do not select undergraduate or graduate computer majors as often (p. 34).

Numerous studies have tried to explain why males have a more positive attitude toward computer technology than do females (Butler, 2000). The idea that there is a cultural bias with technology being a male domain was suggested by Lage (1991), Sanders (1985), Stalker (1983), and Thurston (1990). The thought that computer technology is linked to math, and identified more closely with males was studied by Culley (1988), Eastman and Krendl (1987), and Thurston (1990). Culley (1988), Lockheed (1985), Stalker (1983) and Wilder (1985) noted that software was biased in favor of male interests. Culley (1988) and Nelson and Cooper (1989) showed the tendency of females to use computers less than males at home. Collis, Kass and Kieren (1989), Linn (1985), and Sanders (1989), found female students using technology significantly less than males in science classes. Koontz (1991) found gender inequities favoring males during classroom instruction related to technology. In addition, Stalker (1983) commented on the fact that during the 1980s there was a lack of women teachers as role models in computer science. Culley (1988) and Sanders (1985) found that males tended to favor games and random play

on the computer, whereas females preferred goal-oriented computer use. Males were also found to be more aggressive in a classroom situation, sitting at computer stations first (Elliot, 1990, Sanders, 1985, Stalker, 1983).

Studies by Fish, Gross, & Sanders, (1986), Hawkins (1985), and Sanders (1985), noted that females, especially during the early teen years, preferred group work and collaboration to working alone and did not find the social setting of the computer lab particularly attractive. According to Green (2001):

> Girls are socialized away from computers through a combination of forces. Teachers and guidance counselors encourage boys more than girls to take computer classes. Parents do the same and are more likely to purchase a computer for a boy. Fathers are more likely to share this experience and computer products are marketed to a male audience (p. 24).

The implications of research carried out by Bruner, Bennett, and Honey (2000) also suggested that:

> Women and girls are much more likely to be concerned with how new technologies can fit into the social and environmental surroundings, whereas men and boys are much more likely to be preoccupied with doing things faster, more powerfully, and more efficiently regardless of social and environmental consequences (p. 168).

Research has demonstrated that the lack of gender-sensitive computer games and lack of girls' early exposure to technology also compounded this gender gap.

From the mid-1990s to the present, there have been mixed reviews with respect to gender differences (Butler, 2000). Many researchers believe that computer

technology inequities still exist. According to a study by the American Association of University Women (AAUW, 1999), "...girls of all ethnicities consistently rated themselves ... lower than boys on computer ability" (p. 71). The report also stated:

> As a whole, research shows that girls have developed an appreciably different relationship to technology than boys, and that as a result, technology may exacerbate rather than diminish gender inequities as it becomes more integral to the K-12 curriculum (p. 72).

According to Durndell, Glissov and Siann (1995) and AAUW (1999), female enrollment in computer programming courses still lagged behind that of males, women were underrepresented in computer technology careers, and females comprised only 17% of the computer science test takers in public high schools.

Cooper and Stone (1996) found that females tended to experience greater computer anxiety. Boser, Daugherty and Palmer (1996), Durndell et al. (1995), and Hodes (1995-1996) found that females rated themselves lower on computer ability than did males. Swanson (1997) and Koch (1994) reported that socioeconomic conditions in the United States tended to reinforce female's negative attitudes toward computer technology. In one of the studies, involving 15,577 10th grade students, researchers found that female students were less likely to use computers in both science and mathematics than males, although females were more likely to use calculators in their mathematics class than males (Owens & Waxman, 1998).

Other studies, however, have suggested that the gender gap may be narrowing (Smith & Necessary, 1996; Ayersman, & Reed, 1995-1996), although a study of computer skills at Sultan Qaboos University by Qutami and Abu-Jaber (1997)

showed significant differences in some specific low-level computer skills in favor of males. No significant differences, however, were found in the advanced skills. Ayersman and Reed (1995-1996) investigated the effects of learning style, programming, and gender on computer anxiety and found that females significantly outperformed males on the hands-on programming component of the exam. Females also outperformed males on the written performance measure. Huang and Waxman (1996), in a study of middle school students, found that there were no significant differences between males and females on technology use in mathematics. The research done by Schweingruber, H. & Brandenburg, C. L. (2001) suggested that the gender gap that once existed with regard to computer access, use and perceived expertise were narrowing significantly. The research concluded that the rapidity with which acculturation to the Internet and World Wide Web was taking place among America's youth might be responsible for less gender-biased technology outcomes in schools and eventually, in the workforce.

The literature suggests that researchers are looking at ways to enhance the computer experiences of females (Butler, 2000). Koch (1994) indicated that collaborative activities tended to increase females' computer use. In addition, Eastman and Krendl (1987) found that the type of computer task that was initiated contributed to female attitudes. The work of Valenza (1997) and Koch (1994) highlighted the importance of exposing middle school students to computers. It was their belief that attitudes toward computer technology were influenced most during the adolescent years.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to present the methodology used in this study. The subjects and instrument of the research are described. The final section of this chapter focuses on data collection and data analysis.

Research Methods

This study employed a combination of quantitative and qualitative methods to examine the impact of the Living History Online Project on the students' computer use, skills, attitudes toward computer technology and history learning using primary sources in four Western Massachusetts public schools during the academic year of 2002 and 2003. As stated in Gay and Peter Airasian's book Education Research: "Quantitative and qualitative approaches represent complementary components of the scientific and disciplined inquiry approach. Taken together, they represent the full range of education research methods" (Gay and Airasian, 2000, p. 9).

In this study, the primary reliance was on the quantitative method and the quantitative data provided answers for the research questions stated in Chapter One. Qualitative methods, sensitive to the classroom context and the personal perspectives of subjects, were used as a supplementary means that allowed the researcher to probe beyond the quantitative results because "the observations, reflections, and works of teachers and students are recognized as important sources of knowledge about what is going on both inside and outside the classroom" (Merriam 1998).

Instrument

The instrument used to collect quantitative data for this research was the Student Survey (Appendix B). This Likert scale computer survey was composed of items from similar questionnaires developed by researchers previously. They include: "A Scale of Children's Attitudes to Computers" (reliability: 0.82, Todman and Portia, 1990), "Young children's Computer Inventory" (reliability: 0.78, Miyoshita and Knezek, 1992) and "Computer Attitude Scale" (reliability: 0.81, Shashaani, 1992). These surveys have been used extensively by researchers because they are effective and reliable measures of attitudes toward computer technology.

The survey items created for this research were modified to reflect the participants and the subject matter in this study. The Student Survey consisted of the following categories: computer use, computer skills, attitudes toward computer technology and history learning. The last part of the survey was to collect demographic information of the participants so that those variables, including gender, grade level, access to computers at home and speaking English as the first language could be investigated.

The researcher also used the instruments of class observations and informal interviews. The reflections of the students and the teachers on the project collected in this way were a valuable part of the qualitative data.

The survey and interview questions for this research study were initially reviewed by the members of the dissertation committee, the coordinator for the Living History Online Project and all the teachers participating in the project. A

consent letter preceded the survey to explain its general purpose along with brief instructions.

Subjects

The subjects of the study included 64 students of 4th, 5th and 8th grades, and 8 teachers (4 classroom and 4 computer) from four public schools in Amherst, Pelham, Hatfield and Springfield of Western Massachusetts. All four schools have a diverse student population and are comprised of a heterogeneous mix of students, including special needs and ESL students. The family income of the students ranges from low on a socioeconomic scale to those of more affluent means. All four schools have computer labs as well as computers in each classroom.

Wildwood Elementary School in Amherst offers rich resources and programs to a multi-ethnic and multi-racial community of over 515 students in Kindergarten through grade six. Of which, 185 out of the total 515 are African-American, Asian, Hispanic, and American Indian ethnic groups. There are about 100 staff members, which serve 475 families in Amherst with a population of 34,874. Chinese bilingual and ESL programs are offered. Technology is an integral part of curriculum for student learning. The students who participated in this project were from the 5th grade and their project was on Shays' Rebellion.

Pelham Elementary School is a rural school that serves the 120 kindergarten through sixth grade students of the small community of Pelham, Massachusetts. There is one class per grade in the school with full inclusion of special needs students. About 1,430 people live in Pelham. Pelham is best known as the home of

Daniels Shays who was the leader of Shays' Rebellion. The students who participated in this project were from the 4th grade, the youngest among all the participants. They did a research project on the History of the Pelham Town Hall Complex.

Hatfield's Dorothy M Breor Elementary School currently has 265 students from kindergarten through sixth grade, mostly from middle class. Hatfield is a small town with a population of 3,250 people. There is not much diversity in the school and minority students make up less than 10% of the student population. The students who participated in this project were from the 5th grade, and they did a research project on the Study of Wills in Hatfield.

Springfield Chestnut Accelerated Middle School for the Visual and Performing Arts is a large urban school with more than 1,500 students in grade 6, 7 and 8. Springfield is a city with a population of 152,082. The school serves as a magnet school, attracting students from all across the city who want to have a curricular focus in the visual and performing arts. The school is racially diverse with approximately one-third Latino students, one-third African American students, and one-third White students. The students who participated in this study were from the 8th grade, and they were the oldest students in the study. Their research project was on the History of the Underground Railroad in Springfield, Massachusetts.

Data Collection

The Living History Online Project started in September 2002 with professional development activities. All the teachers who participated in the project

attended the workshops on computer technology, took the tour to the Special Collections in Amherst Jones's Library, and visited all the four participating schools. A monthly meeting was held with all the teachers, the project coordinators and the researcher to discuss the lesson plans that helped instruct students on the differences between primary and secondary sources as well as the integration of computer technology into the history curriculum. At the same time the computer technology equipments provided by the grant such as scanners, digital cameras and web-authoring programs were allocated to the schools according to their needs. During the first half of the project, the teachers were preparing to construct their own local history website with their classes, with the focus on local curriculum guidelines. The project coordinators and the researcher worked together to generate, then revise, a list of survey questions for students and teachers that focused on their computer use, skills, attitudes towards computer technology and history learning.

A consent letter was obtained from the participants before the pre survey, which was conducted by the class teachers without the presence of a third person prior to the start of the project for students in January 2003. The post survey was administered at the end of the project in June 2003. Students were ensured that the survey was not a test to measure their performance and that it was anonymous.

Between January and June 2003, the students who participated in the Living History Online Project, chose the topics they were interested in; worked in small groups and conducted research using the primary sources supplied by the special collections at the local libraries, the Internet and the web links created by CCBIT history specialists. Besides working in the classrooms and computer labs, the

students took field trips to the local historical sites, history museums, libraries and town halls to learn more about their research projects. Using the computer technology devices funded by the grant, they interviewed people with knowledge of their projects. They took digital images and scanned primary sources information. After completing their research, students learned a web-authoring program, FrontPage, with the help of the computer teachers and CCBIT computer experts. As a result, each class created a website to showcase its local history project. The websites were then linked to the school district websites (See Appendix C Students Projects).

The qualitative data of class observations, informal interviews, and the students' reflections to the project were gathered between the pre and post surveys. The researcher visited the classes regularly and took field notes on how teachers integrated computer technology in their instruction and how students learned with computer technology in the classroom. Regular monthly meetings were held with the teachers to discuss the projects and students' progress. Informal interviews among the teachers and the students were conducted during the class visits and the monthly meetings.

Data Analysis

The quantitative data obtained from the pre and post surveys were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were provided including the demographic data.

Analyses of the differences between the pre and post surveys were performed both at the item level and at the aggregate level. To analyze the pre and post differences at the item level, the researcher utilized an approximation to binomial distribution. First the ordinal scale was recoded into two categories, e.g. user vs. non-user, skilled vs. unskilled and positive vs. negative. Next, the rate of one of the categories, (e.g. user, skilled and positive) in the pre survey was compared to those in the post survey, and tested if the differences were equal to zero.

To analyze the data at the aggregate level, the researcher employed ANOVA, a univariate analysis of variance procedure. The dependent variables were the difference between the pre and post survey scores of each category. The independent variables were the grouping of participants e.g. grade (3 levels) and gender (2 levels).

A one sample t-test statistic with repeated measure was selected to test if overall there were significant difference in students' skills and attitudes before and after the intervention. Once it was determined that significant difference was detected, the researcher further assessed the differences in terms of groups using multivariate analysis of variance. Confidence levels of the ANOVA comparisons were set at .95.

Qualitative data were analyzed interpretively by organizing the data into categories, identifying patterns and producing a descriptive narrative synthesis. The qualitative data were also used to provide explanations for the changes reflected in the quantitative data from the pre and post surveys.

CHAPTER 4

FINDINGS

This study investigated the impact of the Living History Online Project on students' computer use, skills, attitudes toward computer technology and history learning. It also examined whether these attitudes differed in relation to some variables including gender, grade level, and access to computer at home as well as speaking English as the first language.

This chapter presents the data collected from the pre and post student surveys. It starts with the results of the demographic information on the variables. Following the demographic information are the findings from the different categories in the student survey: computer use, computer skills, attitudes toward computer technology and history learning. At the end of the chapter are the findings from the qualitative data which include class observations, informal interviews and reflections of the students and the teachers to the project.

Student Demographic Information

Out of the 64 students (100% participation rate) who participated in the survey, twenty-seven were male students and 37 were female students. Fourteen students were from the 4th grade, thirty-seven students were from the 5th grade, and 13 students were from the 8th grade. The total number of students who had a computer at home was 62, and 58 students' first language was English (Table 1).

Table 1: Student demographic information

Gender		Grade level			Computer at home		English	
Boys	Girls	4th	5th	8th	Yes	No	Yes	No
27	37	14	37	13	62	2	58	6

Computer Use

The first section of the student survey was on computer use, and the Likert scale (never, rarely, occasionally, regularly and always) was used to measure the frequency of the students' use of computers for different tasks. For data analysis, the ordinal scale was recoded in two categories: the scale of "occasionally, regularly and always" was regarded as a "user" while the scale of "never and rarely" was regarded as a "non-user" so as to show the frequencies of students using computer technology. An approximation to binomial distribution was employed with the criteria of $\alpha = .05$. The results are shown in Table 2 and Table 3.

Table 2: The percentage of "USER" in pre and post surveys

Item	Pre (%)	Post (%)
Item 1	92	97
Item 2	84	80
Item 3	30	47*
Item 4	83	89
Item 5	14	17
Item 6	58	75*
Item 7	86	80
Item 8	59	66
Item 9	86	95
Item 10	19	61*
Item 11	44	58
Item 12	14	55*
Item 13	38	31
Item 14	48	52
Item 15	48	52

* Significant

Table 2 shows the percentage of students who are "users" in both the pre and post surveys. The test was performed by converting the proportion of "user" into Z scores. Out of the 15 items, the following four showed statistically significant differences:

Item 3: Use computers for reading.

Item 6: Use computers for history learning.

Item 10: Use digital cameras for class project

Item 12: Use computers for website design.

Table 3: Percentage of students who changed in computer use between pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1	2	2	91	6
Item 2	9	11	75	5
Item 3	11	42	19	28*
Item 4	8	3	75	14
Item 5	11	72	3	14
Item 6	14	11	44	31*
Item 7	13	8	73	6
Item 8	6	28	53	13
Item 9	5		81	14
Item 10	5	34	14	47*
Item 11	17	25	27	31
Item 12	3	42	11	44*
Item 13	17	52	20	11
Item 14	14	34	34	17
Item 15	17	31	31	20

* Significant

Table 3 gives the percentage of students who changed in computer use between the pre and post surveys. The data show that some students changed from "user" to "non-user", and some changed from "non-user" to "user". The data in Table 3 also show the results of the students who didn't change. Some of them remained "non-user" or "user" between the pre and post surveys. The following is the percentage for the four items (3, 6, 10, and 12) that had significant differences.

Of all the students, 28% of them changed from not using computers for reading to using them (Item 3), and 31% changed from not using to using computers for history study (Item 6). The biggest difference occurred in Item 10. Of the students who didn't use digital cameras for class projects before, 47% were using them now. Item 12 had the second biggest increase among the four items. At the end of the

project, 44% of the students were using computers to design websites, which they didn't do before the project.

It is important to point out that besides the four items that had statistically significant differences in change from "non-user" to "user", Table 3 also shows a high percentage of "users" in both the pre and post surveys for the following items:

Item 1: Use computers at school (91%).

Item 2: Use computers outside of school (75%).

Item 4: Use computers for writing (75%).

Item 7: Use computers for games (73%).

Item 8: Use email to communicate with others (53%).

Item 9: Use Internet for research (81%).

The reason that the data results didn't show statistically significant differences for these items is because they had a high percentage of "users" in both the pre and post surveys. This finding indicates that the digital age has a very strong influence on these students, and computer technology has become part of their everyday life. They use it both at school and at home. They use it for doing school work and for playing games. They also use it to communicate with others.

On the other hand, a high percentage of "non-users" in both the pre and post surveys could be found in these two items:

Item 5: Use computers for math (72%).

Item 13: Use educational software for learning (52%).

The explanation for this finding is that the Living History Online Project did not involve students in using computers for math. Most of the project research was

done over the Internet and hardly any educational software was used. That's why many students were "non-users" for these two items.

Table 4 and 5 are the data result of the percentage for male and female students who changed in computer use between the pre and post surveys.

Table 4: Percentage of male students who changed in computer use between the pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1	4		89	7
Item 2	11	11	70	7
Item 3	7	52	19	22*
Item 4	11	4	59	26
Item 5	11	78	4	7
Item 6	11	22	41	26*
Item 7	7	7	74	11
Item 8	4	41	48	7
Item 9	7		70	22
Item 10	4	37	11	48*
Item 11	22	33	7	37
Item 12		56	7	37*
Item 13	22	48	11	19
Item 14	7	33	33	26
Item 15	19	33	30	19

Gender = male

* Significant

Table 5: Percentage of female students who changed in computer use between the pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1		3	92	5
Item 2	8	11	78	3
Item 3	14	35	19	32*
Item 4	5	3	86	5
Item 5	11	68	3	19
Item 6	16	3	46	35*
Item 7	16	8	73	3
Item 8	8	19	57	16
Item 9	3		89	8
Item 10	5	32	16	46*
Item 11	14	19	41	27
Item 12	5	32	14	49*
Item 13	14	54	27	5
Item 14	19	35	35	11
Item 15	16	30	32	22

Gender = female * Significant

For the four items that showed a statistically significant difference between the pre and post surveys, a different trend was reflected when the results were broken down by gender (Table 4 and Table 5). For Item 3: "Use computers for reading", the rate of changes from "non-user" to "user" for male students, it was 22%, while for female student it was 32%. For Item 6: "Use computers for history learning", the change was 26% for male students and 35% for female students. For Item 10: "Use digital cameras for class project", 48% of male students and 46 % of female students changed. For Item 12: "Use computers for website design, 37% of boys, and 49 % of girls changed from "non-user" to "user". To sum up, the data results for the computer use section showed that, in general, more girls changed from "non-user" to "user" than boys did between the pre and post surveys.

Table 6: Percentage of 4th grade students who changed in computer use between the pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1			86	14
Item 2	7	14	57	21
Item 3	14	57	7	21*
Item 4	14		79	7
Item 5	7	86		7
Item 6	14	29	29	29*
Item 7	14	7	71	7
Item 8	7	21	43	29
Item 9	7		86	7
Item 10		21		79*
Item 11	14	7	36	43
Item 12		50	7	43*
Item 13	36	57	7	
Item 14	21	57	7	14
Item 15		21	21	57

Grade Level = 4th grade * Significant

Table 7: Percentage of 5th grade students who changed in computer use between the pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1	3		95	3
Item 2	5	11	84	
Item 3	11	38	24	27*
Item 4	5	5	73	16
Item 5	11	68	5	16
Item 6	16	5	49	30*
Item 7	8	8	78	5
Item 8	3	38	54	5
Item 9	5		81	14
Item 10	5	30	22	43*
Item 11	22	24	22	32
Item 12	5	43	16	35*
Item 13	14	41	30	16
Item 14	14	22	49	16
Item 15	19	32	43	5

Grade Level = 5th grade * Significant

Table 8: Percentage of 8th grade students who changed in computer use between the pre and post surveys

Pre - Post (%)	User – Non-user (%)	Nonuser – Non-user (%)	User – User (%)	Non-user – User (%)
Item 1		8	85	8
Item 2	23	8	69	
Item 3	8	38	15	38*
Item 4	8		77	15
Item 5	15	69		15
Item 6	8	8	46	38*
Item 7	23	8	62	8
Item 8	15	8	62	15
Item 9			77	23
Item 10	8	62	8	23*
Item 11	8	46	31	15
Item 12		31		69*
Item 13	8	77	8	8
Item 14	8	46	23	23
Item 15	31	38	8	23

Grade Level = 8th grade * Significant

For the four items with statistically significant differences, favorable changes also occurred in terms of grade level (Table 6, 7, and 8). On Item 3: "Use computers for reading", the percentage for 4th grade students that changed from "non-user" to "user" between the pre and post surveys was 21%, for 5th grade it was 27% and for 8th grade it was 38%. On Item 6: "Use computers for history learning", the change was 29% for 4th grade students, 30% for 5th grade students, and 38% for 8th grade students. On Item 10: "Using digital cameras for class project", 79% of 4th grade students, 43% of 5th grade students and 23% of 8th grade students changed from "non-user" to "user". On Item 12: "Use computers for website design, 43% of 4th grade students, 35% of 5th grade students, and 69% of 8th grade students changed from "non-user" to "user".

The trends for the grade level in computer use indicated that more of the younger students changed from "non-user" to "user" in using digital cameras for class projects and web design, while more of the older students changed from "non-user" to "user" in applying computers for school work such as reading and history learning.

Computer Skills

The second section of the student survey examined the changes in terms of computer skills. The Likert scale (excellent, above average, average, below average and never used) was used to measure student computer skills. For data analysis, the ordinal scale was recoded into two categories: the scale of "excellent, above average and average" was recoded as "skillful", while the scale of "below average and never used" was looked at as "unskillful". An approximation to binomial distribution was employed with the criteria of $\alpha = .05$. Table 9 and Table 10 show the results.

Table 9: Percentage of "SKILLFUL" in the pre and post surveys

Item	Pre (%)	Post (%)
Item 16	56	69
Item 17	77	98
Item 18	33	75*
Item 19	63	75
Item 20	41	78*
Item 21	75	95
Item 22	61	67
Item 23	38	56
Item 24	41	45
Item 25	42	58

* Significant

Table 9 presents the percentage of students who were skillful in computer skills in both the pre and post surveys. The test was performed by converting the proportion of "skillful" into Z scores. Out of the 10 items, the following two showed a statistically significant difference:

Item 18: Use Front Page for website design.

Item 20: Use digital camera for images.

Table 10: Percentage of students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	11	20	45	23
Item 17		2	77	22
Item 18	6	19	27	48*
Item 19	9	16	53	22
Item 20	6	16	34	44*
Item 21	2	3	73	22
Item 22	14	19	47	20
Item 23	13	31	25	31
Item 24	8	47	33	13
Item 25	14	28	28	30

* Significant

Table 10 gives the percentage of students who changed in computer skills between the pre and post surveys. The data show that some students changed from "skillful" to "unskillful", and some changed from "unskillful" to "skillful". The data in Table 10 also show the results of the students who didn't change. Some of them remained "unskillful" or "skillful" between the pre and post surveys. The following

is the percentage of change for the two items (18 and 20) that had significant differences.

Of all the students, 48% of them changed from "unskillful to skillful on Item 18: "Use Front Page for website design" and 44% of the students became "skillful" on Item 20: "Use digital camera for images".

These results were highly expected since the Living History Online Project involved the students in frequent use of Front Page for website designing and digital cameras for their project images.

Although there was no statistically significant difference in the change, Table 10 also indicates a high percentage of students who perceived themselves as "skillful" in both the pre and post surveys for the following items:

Item 17: Use Microsoft word for writing (77%).

Item 19: Use PowerPoint for presentations (53%).

Item 21: Use Internet for research (73%).

The reason for these results may be due to the fact that the students frequently use computers for writing, doing research over the Internet and giving PowerPoint presentations.

In terms of gender, Table 11 and 12 present their changes in computer skills.

Table 11: Percentage of male students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	7	26	41	26
Item 17		4	70	26
Item 18	7	22	26	44*
Item 19	15	19	44	22
Item 20	4	22	37	37*
Item 21	4	4	70	22
Item 22	15	30	30	26
Item 23	7	33	26	33
Item 24		48	44	7
Item 25	11	22	41	26

Gender = male * Significant

Table 12: Percentage of female students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	14	16	49	22
Item 17			81	19
Item 18	5	16	27	51*
Item 19	5	14	59	22
Item 20	8	11	32	49*
Item 21		3	76	22
Item 22	14	11	59	16
Item 23	16	30	24	30
Item 24	14	46	24	16
Item 25	16	32	19	32

Gender = female * Significant

For the two items in computer skills that showed statistically significant differences between the pre and post surveys, a different trend was reflected when the

results were broken down by gender. For Item 18: Use Front Page to design websites, the change from "unskillful" to "skillful" for male students is 44%, and for female students it is 51%. For Item 20: Use digital camera for images, 37% of the boys and 49% of the girls changed.

The data results in computer skills showed a similar trend as that in computer use. More female students than male students changed from "unskillful" to "skillful".

In terms of grade level, Table 13, 14 and 15 show the change for 4th, 5th and 8th grade from unskillful to skillful between the pre and post surveys.

Table 13: Percentage of 4th grade students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	7	29	43	21
Item 17			57	43
Item 18	7	29	7	57*
Item 19	21	43	21	14
Item 20	7	7	36	50*
Item 21			64	36
Item 22	7		43	50
Item 23	7	57	14	21
Item 24	7	71	21	
Item 25	7	21	29	43

Grade Level = 4th grade * Significant

Table 14: Percentage of 5th grade students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	5	22	43	30
Item 17			84	16
Item 18	3	11	35	51*
Item 19	5	5	68	22
Item 20	5	16	41	38*
Item 21	3		78	19
Item 22	16	24	51	8
Item 23	19	22	27	32
Item 24	11	38	38	14
Item 25	16	27	30	27

Grade Level = 5th grade * Significant

Table 15: Percentage of 8th grade students who changed in computer skills between the pre and post surveys

Pre – Post (%)	Skillful – Unskillful (%)	Unskillful – Unskillful (%)	Skillful – Skillful (%)	Unskillful – Skillful (%)
Item 16	31	8	54	8
Item 17		8	77	15
Item 18	15	31	23	31
Item 19	8	15	46	31
Item 20	8	23	15	54
Item 21		15	69	15
Item 22	15	23	38	23
Item 23		31	31	38
Item 24		46	31	23
Item 25	15	38	23	23

Grade Level = 8th grade * Significant

For the two items in computer skills that showed a statistically significant difference between the pre and post surveys, the trend of change for 4th, 5th, and 8th

grades was presented respectively in Table 13, 14 and 15. On Item 18: "Use Front Page to for website design", the change for 4th grade students was 57%, the highest rate of change from "unskillful" to "skillful" between the pre and post surveys. For 5th grade it was 51%, and for 8th grade it was 31%. On Item 20:"Use digital cameras for images", 50 % of 4th grade students, 38% of 5th grade students and 54% of 8th grade students changed from "unskillful" to "skillful".

The trends for the grade level in computer skills showed that more of the younger students changed from "unskillful" to "skillful" in website designing than older students. However, more of the older students changed from "unskillful" to "skillful" in using digital cameras for images than the younger students.

Attitudes toward Computer Technology

The third section of the student survey is on their attitudes toward computer technology. The Likert scale (strongly agree, agree, neutral, disagree and strongly disagree) was used to as a measurement. For data analysis, the scale was recoded into two categories: "positive" and "negative". To analyze the data at the aggregate level, the researcher employed ANOVA, a univariate analysis of variance procedure. The dependent variables were the differences between the pre and the post surveys for each domain. The independent variables were the grouping of participants, e.g. grade (3 levels) and gender (2 levels). For analysis at the item level, an approximation to binomial distribution was employed with the criterion of $\alpha = .05$.

Table 16: Paired t-test on the students' attitudes toward computer technology (One-Sample Test)

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
mean of part3a difference	1.660	63	.102	.1125	-.0229	.2479

Table 17: Between-subjects effects on students' attitudes toward computer (Dependent Variable: mean of computer attitudes difference)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.644	5	.129	.418	.834
Intercept	.468	1	.468	1.518	.223
GENDER	.022	1	.022	.070	.792
GROUP	.021	2	.011	.034	.966
GENDER GROUP	.358	2	.179	.582	.562
Error	17.866	58	.308		
Total	19.320	64			
Corrected Total	18.510	63			

The data results for this section showed that no statistically significant change (Table 16) occurred between the pre and post surveys in terms of students' attitudes toward computer technology ($t_{63} = 1.66$, $p = .10$). These results were consistent across gender and grade levels (Table 17).

Table 18: Percentage of "POSITIVE" for students' attitudes toward computer technology in the pre and post surveys

Item	Pre (%)	Post (%)
Item 26	98	98
Item 27	97	94
Item 28	91	94
Item 29	81	86
Item 30	89	95
Item 31	97	98
Item 32	86	83
Item 33	75	80
Item 34	80	89
Item 35	75	81

Table 19: Percentage of students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26	2		97	2
Item 27	6		91	3
Item 28	5	2	86	8
Item 29	6	8	75	11
Item 30	5	2	84	9
Item 31	2		95	3
Item 32	6	11	80	3
Item 33	14	6	61	19
Item 34	8	3	72	17
Item 35	6	13	69	13

Table 18 shows the percentage of "POSITIVE" for students' attitudes toward computer technology in the pre and post surveys. There were some changes, but again, they were not significant. The explanation for the non-significant change could

be found in Table 19, where a high percentage of "positive" attitudes appeared in both the pre and post surveys for all the items in this section:

Item 26: I enjoy doing things on the computer (97%).

Item 27: I am tired of using a computer (9%).

Item 28: It is important to learn how to use computer (86%).

Item 29: It is difficult to learn how to use a computer (25%).

Item 30: I feel comfortable learning about computer technology (84%).

Item 31: I feel nervous using a computer (5%).

Item 32: I like to work alone on the computer (80%).

Item 33: I like to work with others on the computer (61%).

Item 34: I like to see my work on the website (72%).

Item 35: I like to read my classmates' work on the website (69%).

These results indicated that with the increased integration of computer technology into the public school curriculum, more positive attitudes would be expected of the students who use computer frequently for school work and entertainment. The students in this study had very positive attitudes toward computer technology all along. They enjoyed doing things on the computer, and felt important and comfortable learning computer technology. They didn't feel tired or nervous using the computer. They also liked to see their own work and their classmates' work on the website.

Table 20 and 21 show the data of changes in students' attitudes toward computer technology for boys and girls.

Table 20: Percentage of male students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26	4		93	4
Item 27	7		85	7
Item 28	7		85	7
Item 29	4	15	70	11
Item 30	7	4	78	11
Item 31			96	4
Item 32		15	81	4
Item 33	15	11	59	15
Item 34	11	4	67	19
Item 35	7	22	67	4

Gender = male

Table 21: Percentage of female students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26			100	
Item 27	5		95	
Item 28	3	3	86	8
Item 29	8	3	78	11
Item 30	3		89	8
Item 31	3		95	3
Item 32	11	8	78	3
Item 33	14	3	62	22
Item 34	5	3	76	16
Item 35	5	5	70	19

Gender = female

Table 20 and 21 present the differences in changes for male and female students. However, the data in Table 17 show that no significant differences in the changes in terms of their attitudes toward computers ($F_{1, 58} = .07$, $p = .79$). Again, a high

percentage of "positive" could be found in both the pre and post surveys for all the items in this section for male and female students.

It is interesting to note that for Item 26: "I enjoy doing things on the computer", all of the girls scored "positive" in both the pre and post surveys, while for Item 31: "I feel nervous using a computer", all of the boys had a "negative" response. These results agreed with the literature review that boys had more confidence in computer technology than girls (Johanson, 1985).

In terms of grade level, Table 22, 23 and 24 present the rate of changes for 4th, 5th and 8th grades respectively between the pre and post surveys.

Table 22: Percentage of 4th grade students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26			93	7
Item 27	7		86	7
Item 28			100	
Item 29	7	14	64	14
Item 30			93	7
Item 31			93	7
Item 32	7	7	79	7
Item 33	14	14	57	14
Item 34	7		71	21
Item 35	7	7	71	14

Grade Level = 4th grade

Table 23: Percentage of 5th grade students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26	3		97	
Item 27	5		92	3
Item 28	5	3	81	11
Item 29	5	5	78	11
Item 30	5		86	8
Item 31			97	3
Item 32	3	14	81	3
Item 33	11	5	70	14
Item 34	11		76	14
Item 35	5	8	78	8

Grade Level = 5th grade

Table 24: Percentage of 8th grade students who changed in their attitudes toward computer technology between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 26			100	
Item 27	8		92	
Item 28	8		85	8
Item 29	8	8	77	8
Item 30	8	8	69	15
Item 31	8		92	
Item 32	15	8	77	
Item 33	23		38	38
Item 34		15	62	23
Item 35	8	31	38	23

Grade Level = 8th grade

Table 22, 23 and 24 present the differences in changes for 4th, 5th and 8th grades. Again, no significant changes (Table 17) were found in terms of computer attitude for grade levels ($F_{2,\ 58} = .03$, $p = .97$). A high percentage of "positive" was also

found in both the pre and post surveys for all the items in terms of grade level. However, special attention should be brought to Item 26 and Item 28. The results showed (Table 22) that for Item 28: "It is important to learn how to use computer", all the 4th grade students strongly agreed in both the pre and post surveys. For Item 26: "I enjoy doing things on the computer", as shown in Table 24, all the 8th grade students had a positive response in both the pre and post surveys.

Attitudes toward History Learning

The fourth section of the student survey tested if there was a change in the students' attitudes toward history learning from the pre to post surveys. The same analysis procedure for section three was applied for the data in this section to reflect the students' change of attitudes toward history learning.

Table 25: Paired t-test on the students' attitudes toward history learning (One-Sample Test)

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
mean of part3b difference	-.146	63	.885	-.0109	-.1610	.1391

Table 26: Between-subjects effect on students' attitude toward history learning (Dependent Variable: mean of history attitude difference)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.019	5	.204	.545	.741
Intercept	.015	1	.015	.041	.840
GENDER	.186	1	.186	.498	.483
GROUP	.604	2	.302	.807	.451
GENDER GROUP	.043	2	.022	.058	.944
Error	21.703	58	.374		
Total	22.730	64			
Corrected Total	22.722	63			

Table 27: Percentage of "POSITIVE" in students' attitudes toward history learning in the pre and post surveys

Item	Pre (%)	Post (%)
Item 36	67	64
Item 37	64	66
Item 38	83	77
Item 39	56	59
Item 40	75	84
Item 41	80	72
Item 42	69	70
Item 43	70	67
Item 44	75	73
Item 45	58	67

Table28: Percentage of students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36	19	17	48	16
Item 37	11	23	53	13
Item 38	14	9	69	8
Item 39	14	27	42	17
Item 40	5	11	70	14
Item 41	14	14	66	6
Item 42	13	17	56	14
Item 43	19	14	52	16
Item 44	13	14	63	11
Item 45	13	20	45	22

Statistically significant changes didn't occur (Table 25) in terms of students' attitudes toward history learning ($t_{63} = -.14$, $p = .89$). These results were also consistent across gender and grade levels (Table 26). The only noticeable increase (22%) from "negative" to "positive" between the pre and post surveys (Table 28) was Item 45: "I like to do history projects". This result showed the positive impact of the Living History Online Project on students' attitudes toward doing history projects.

Again, a high percentage of "positive" attitudes in both pre and post surveys could also be found in many of the items in this section:

Item 38: I like to find out about the past (69%).

Item 40: I like to visit historic sites (70%).

Item 41: I like to visit history museums (66%).

Item 42: I like to read books about people and events in the past (56%).

Item 44: I like to do research about people and events from Internet (63%).

These results indicated that students were interested in visiting historic sites and history museums, and they were curious about events and people in the past. Also they liked to do research on the past from the Internet.

However, over half of the students (53%) agreed that "history is boring" (Item 37) and many students (42%) were not so enthusiastic about "remembering dates and names in history learning" (Item 39). These findings agreed with the research studies mentioned in the literature reviews on history learning (Cantu and Warren, 2003).

In terms of gender, Table 29 and 30 show the differences in their changes.

Table 29: Percentage of male students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36	26	19	41	15
Item 37	19	19	37	26
Item 38	15	4	74	7
Item 39	15	26	52	7
Item 40	4	7	78	11
Item 41	22	7	63	7
Item 42	11	15	59	15
Item 43	26	4	41	30
Item 44	11	15	59	15
Item 45	11	19	30	41

Gender = male

Table30: Percentage of female students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36	14	16	54	16
Item 37	5	27	65	3
Item 38	14	14	65	8
Item 39	14	27	35	24
Item 40	5	14	65	16
Item 41	8	19	68	5
Item 42	14	19	54	14
Item 43	14	22	59	5
Item 44	14	14	65	8
Item 45	14	22	57	8

Gender = female

Table 29 and 30 show the gender differences in change of attitudes toward history learning between the pre and post surveys. However, no significant differences occurred (Table 26) between male and female students' attitudes toward history learning ($F_{1, 58} = .50$, $p = .48$). Again, a high percentage of "positive" could be found in both the pre and post surveys for the same items in Table 28. About 74% of the boys and 65% of the girls agreed that they "like to find out about the past" (Item 38). Similar percentages (78% of the boys and 65% of the girls) "like to visit historic sites" (Item 40). For Item 41: "I like to visit history museums", 63% of the boys and 68 % of the girls had a "positive" attitude before and after. Fifty-nine percent of the boys and 54% of the girls responded positively to Item 42: "I like to read books about people and events in the past". Also 59% of the boys and 65% of the girls remained "positive" between the pre and post surveys on Item 44: "I like to do research about people and events from the Internet".

The data in Table 29 and 30 show some interesting trends in terms of students' attitudes toward history learning for boys and girls. For Item 37: "History is boring", only 37% of the boys agreed to the statement in both the pre and post surveys, but there was a 26% of increase from negative attitude to positive attitude. For the same item, the girls, on the other hand, had a high percentage (65%) of positive attitude before and after. For Item 39: "I don't like to remember dates and names in history learning", the data showed that the boys had a high percentage (52%) of positive attitudes between the pre and post surveys, while the girls stayed in a low percentage of 35% before and after. This meant that girls like to remember dates and names in history learning more than the boys. However, the change in girl's attitudes (24%) from negative to positive on this item was much greater than the boys' (7%). The same trend was true for the boys on Item 43: "I like to do research about people and events using the Internet". The positive to positive attitudes between the pre and post surveys were relatively low (41%), but there was an obvious increase (30%) from negative to positive on this item between the pre and post surveys. As for girls, 59% of them showed a positive attitude on doing research about people and events over the Internet before and after.

Table 31: Percentage of 4th grade students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36	43	21	36	
Item 37	14	36	36	14
Item 38	21		79	
Item 39	36	29	29	7
Item 40	14	7	71	7
Item 41	36		57	7
Item 42	29		50	21
Item 43	29		43	29
Item 44		7	86	7
Item 45	21	14	50	14

Grade Level = 4th grade

Table 32: Percentage of 5th grade students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36	16	11	57	16
Item 37	11	16	62	11
Item 38	16	5	70	8
Item 39	8	27	51	14
Item 40	3	8	76	14
Item 41	8	14	73	5
Item 42	11	11	65	14
Item 43	22	5	59	14
Item 44	16	11	65	8
Item 45	8	16	49	27

Grade Level = 5th grade

Table 33: Percentage of 8th grade students who changed in their attitudes toward history learning between the pre and post surveys

Pre – Post (%)	Positive – Negative (%)	Negative – Negative (%)	Positive – Positive (%)	Negative – Positive (%)
Item 36		31	38	31
Item 37	8	31	46	15
Item 38		31	54	15
Item 39	8	23	31	38
Item 40		23	54	23
Item 41	8	31	54	8
Item 42		54	38	8
Item 43		54	38	8
Item 44	15	31	31	23
Item 45	15	38	31	15

Grade Level = 8th grade

Table 31, 32 and 33 present the percentage of changes for the 4th, 5th and 8th grade students respectively. The data in Table 26 (Between-subjects effect on students' attitude toward history learning) show that there were no significant differences in the changes between the pre and post surveys in different grade levels ($F_{2,\ 58} = .80,\ p = .45$). A high percentage of "positive" could be found in both the pre and post surveys for all the items reported in Table 28. An interesting finding was noted in Item 36: "I enjoy learning history". The results (Table 31) showed a considerable drop of 43% of the 4th grade students from positive to negative between the pre and post surveys while the number increased (31%) for the 8th grade students from negative to positive before and after (Table 33). The 5th grade students had a high percentage (57%) positive to positive with a 16% drop from positive to negative and 16% increase from negative to positive (Table 32).

For Item 38: "I like to find out about the past", although the 4th and 5th graders stayed in a high rate of 79% and 70% "positive" to "positive" respectively

between the pre and post surveys, the rate of drop (21% and 16%) from "positive" to "negative" was also noticeable. The 8th graders, on the contrary, kept the relatively low "positive" to "positive" rate of 54%, but increased 15% from "negative" to "positive".

For Item 40: "I like to visit historic sites", while 5th and 8th graders increased from "negative" to "positive" (14% and 23%), the 4th graders dropped from "positive" to "negative" by 14%.

A high percentage of drop from "positive" to "negative" for the 4th grade students occurred in Item 41: "I like to visit history museums" (36%), Item 42: "I like to read books about people and events in the past" (29%), and Item 43: "I like to do research about people and events using primary sources" (29%). The 8th grade students had a relatively high rate (31%, 54% and 54%) "negative" to "negative" attitudes between the pre and post surveys for the above items.

Interestingly, for Item 45: "I like to do history project", the 4th graders increased 21% from "positive" to "negative", while the 5th graders had a change of 27% from "negative" to "positive". The 8th graders, however, stayed in a relatively high rate of 38% "negative" to "negative".

Findings from the Qualitative Data

Besides the quantitative data collected from the pre and post surveys, the researcher also gathered qualitative data from class observations and informal interviews. The reflections from students and teachers on the Living History Online Project provided additional information for the research. The qualitative data from

the students were summarized into three categories: 1) what they learned about local history, 2) what they learned about computer technology, and 3) what challenges they had doing the project.

Data from student reflection revealed that more than half (65%) of the students enjoyed working on the project and 64% of them believed website designing was useful. One student said: "I really enjoyed this project and I learned much more from researching myself than I could have from a book". Another student stated: "Making the web page was sort of hard because everybody wanted different things. It took us half an hour to decide what background, title, and picture we should use for our website. At the end our website looked pretty good". Class observations also revealed that most of the students were interested in this local history project because they were curious in finding out what happened a long time ago in the town or city in which they live now. During the informal interviews, one student commented on the kind of life people had in her town in the past: "Life was hard back then. Technology was not good. People didn't have a washer or dryer and they didn't even have a Stop & Shop." Another student who studied old wills said, "Wills are important and being old is not so bad. The things considered valuable back then are not the same as we think today." Some students noted that the writing on the old wills was hard to understand because some words were spelled differently and they even meant different things than how they are used today.

Students who did the project on Shays' Rebellion learned about Daniel Shays' life and why the people rebelled. They also did research on the tax laws in

Shays' time. They realized that Shays' Rebellion changed the future of the county dramatically and people had different opinions on Shays' Rebellion.

The youngest group of students who studied their town hall found that they have the oldest Town Hall that is still used in the USA, and that it was named after lord Pelham. Many people moved to Pelham because they were pressured by taxes. One student was surprised to find that a man named Warren Gibbs was killed by his wife, and another student found out that a 3-year old boy buried in the cemetery behind the town hall.

The qualitative data indicated that the students enjoyed using computer technology for history research, and they were enthusiastic about learning new computer skills. Many students expressed their appreciation for the project because the integration of computer technology into the history project enabled them to learn how to manipulate digital images including using digital cameras, getting pictures from clip art and inserting them into the web page. They learned how to edit images and make pictures into a background. One 4th grade student said, "I learned how to find moving picture from clip art and put it on to the computer screen." Another one explained how he learned to scan articles and pictures.

With the help of the computer teachers, the students mastered the web authoring tool, Front Page. They were able to make hyperlinks and preview web pages. One of the 5th grade students said, "I know how to make picture hyperlinks and change the color of hyperlinks." Many students learned how to download games from the internet. Half way through the projects, they became adept at finding information for their research topic over the Internet. They even learned how to use

PowerPoint to present their project. Their final products, the websites (Appendix C), demonstrated their talent and ability in doing research over the Internet, editing digital images and developing websites.

The Living History Online Project also brought challenges to the students. Some of the challenges were computer-related, some were study skill- related, and the biggest challenge seemed to be teamwork.

At the beginning several students had a difficult time finding and saving the project in the right folder. As one student put it, "I had a headache figuring out where to find my files." Later, they started to remind each other "make sure to put the stuff in the right folder." One group of students was frustrated because their team mate forgot to save their work and according to one student, "it was a waste of time." Also a few students didn't use their time wisely and couldn't complete the project on time. Some students complained that "it was difficult learning Front Page and getting the background put in" while others had difficulty understanding the old documents or sitting in front of a screen for a long period of time. One student even said he had "too much American history" and he was sick of it.

The response from the interviews revealed that it was challenging for some students to work with other people in the group. One student said, "My biggest challenge was cooperating with my group members and I hate being bossed around." Another student commented, "I don't like my group because it was hard getting everybody to work together and not fool around." Many students responded that it was not easy working with their partners because not everyone was cooperating and everybody had different opinions. Their comments included, "It took a long time to

pick a color that everyone liked for our website" or "thinking of a good name for our project." Some also complained that their biggest challenge was listening to their group and understanding what everyone was doing. The data from the survey agreed with the findings from the qualitative data. Table 19 shows that many students changed from "positive" to "negative" on Item 33 "I like to work with others on the computers".

Qualitative data from the teachers and their responses can be summarized into four categories: 1) the impact of the project on history teaching, 2) the impact of the project on computer technology, 3) the impact of the project on the students, and 4) the pros and cons of the project.

The teachers believed that the Living History Online Project was excellent because it connected the state and national events in history with local events. One teacher commented, "I was able to see that this was possible and made it come through. My students were able to see how people in Hatfield lived during the Colonial Period by examining artifacts". The teachers also believed the students enjoyed finding and using the primary sources. The students were motivated to look for more sources in order to incorporate them into their projects. As one teacher put it, "I enjoyed watching the kids use the jigsaw approach to their work. Though I don't think they all got a full picture of the entire event, they learned deeply in the fields. They did study and were somewhat versed in topics that others covered".

This project made teachers realize that it was possible to integrate primary sources and technology into a history curriculum. As one teacher stated that she "learned how to present local history in a new way". By working with the students on

their projects, the teachers learned a lot about the local history and the area in which they live in, too.

The Living History Online Project not only had a positive influence on the students' attitudes toward computer technology but also affected the teachers' attitudes. Some teachers felt that through the project, they became more "technology savvy", and they were able to advance some of their own computer skills, which, in turn, would allow them to use computer-based projects more often in teaching. Others stated that the project showed them "new ways to have students gather and express their knowledge". The teachers acknowledged that using the Internet became a part of their teaching, and they believed that it would be helpful to get the students to search more methodically.

One teacher said that she became much more comfortable with a digital camera and knew more about PowerPoint through this project. After exposure to web page development, she felt that web design was not as scary as it looked. This teacher learned how to coordinate a web project as well as a few strategies for the students who found it hard to focus.

The teachers all agreed that the project was wonderful for the students because it gave the students an opportunity to advance their computer skills. At the same time, the project was hands-on and allowed the students to see that learning history could be a lot of fun. The teachers reported that the students enjoyed searching through the primary sources, and they were able and eager to connect the dots themselves. According to some teachers, however, a few students had some trouble, both in gathering and interpreting the information. The teachers

recommended that "more support was needed to give background and context to some of the primary sources" in those cases.

Nevertheless, "the students got a valuable experience of being historians: trying to figure out connections and stories from disparate reports and disjointed sources. They also loved exhibiting their product, the website, to the public. This is always a powerful motivator". Hatfield Technology Resource teacher reported: "Our students were very excited because they could build connections from what was going on in Hatfield to Pre-colonial historical events. Students were also very eager to create web pages especially when they discovered that these web pages would be posted on the Hatfield Public Schools Web Site."

The teachers also believed that this project taught the students more research skills. They learned how to find information and how to use it. Not only did the students learn some basic skills on web development, but they also had a better knowledge of their local history such as Shays' Rebellion, Pelham Town Hall, the old wills in Hatfield, as well as the Underground Railroad and how Springfield had been involved in the struggle for human rights. They learned technology skills and an appreciation for the past.

The teachers gave their opinions on the pros and cons of the Living History Online project. They felt the project was a great way to integrate computer technology in learning history with primary sources. The project provided a relevant education on technology connections. It was also a great networking and the collaboration with teachers in other schools and the help from technology and history experts from CCBIT was wonderful.

The teachers believed the project also provided a unique experience for children to use non-textbook resources. Students really got into the local history. The teachers and students both learned new skills. Additionally, it was a wonderful experience for the students whose participation and learning was often marginal because more people were involved with the "at-risk" students and great support was provided for the project.

The teachers commented on some problems that appeared during the project. For example, promised equipment was not available in a timely fashion and scanners couldn't be used with some classroom computers. Additionally, it took more time than anticipated to present the projects. It required a lot of extra work for the teachers. Finally, sometimes finding appropriate materials was difficult and overwhelming. The teachers felt that they never had enough time.

CHAPTER 5

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the statement of the problem, the purpose of the study, the research questions and the methods. The results from the pre and post survey are discussed. Findings and their implications regarding the impact of the Living History Online Project on students' computer use, skills, as well as their attitudes toward computer technology and history learning are presented. The chapter concludes with the contributions of the project and recommendations for future research studies.

Summary

Living in a rapidly changing technology-rich society, students must be able to develop the skills to access information and resources effectively using computer technology. It is essential that students have positive attitudes toward computer technology. As many variables may affect their attitudes, such as gender, grade level, accessibility and language, it is necessary to study these variables when exploring students' attitudes toward computer technology as well as their attitudes toward the subject matter.

The purpose of this research was to examine the impact of a local history project on students' computer use, skills as well as on their attitudes toward computer technology and history learning. At the same time, the study also investigated some of the variables.

The local history project, funded by the Massachusetts Department of

Education as part of a federal "Enhancing Education Through Technology Integration" grant, integrated computer technology into history curriculum using primary sources. The participants of the project were 64 students from four Western Massachusetts public schools and the project lasted one academic year from September 2002 to September 2003.

This research used both quantitative and qualitative methods. Likert scale pre and post surveys served as the instrument for gathering the quantitative data. Class observations and informal interviews were conducted to collect the supplementary qualitative data for the research.

Discussion

The discussion presented in this section is based on the research questions that were posed at the onset of the investigation.

Research question 1

What impact does the Living History Online Project have on students' computer use?

The data results indicated that the Living History Online Project had a positive impact on students' computer use, and four survey items showed significant differences in change between the pre and post surveys. The students changed from "non-users" to "users" in using computers for 1) reading, 2) history learning, 3) digital images and 4) web design.

During the course of six months from January to June 2003, the students were involved in extensive readings from the Internet and primary sources about their history research projects. They used digital cameras provided by the grant during the

field trips for images. With the help of the computer teachers, they learned Front Page to design websites for their projects.

As shown in Table 3, a high percentage of "non-users" in both the pre and post surveys could be found in using computers for math (Item 5, 72%), and using educational software for learning (Item 13, 52%). The explanation for this is that the Living History Online Project didn't involve the students in using computer for math or using any educational software.

Research question 2

What impact does the Living History Online Project have on students' computer skills?

The Living History Online Project also had a positive impact on students' computer skills. Significant differences between the pre and post surveys for students changed from "unskillful" to "skillful" appeared in image editing and web designing. The students showed great interest in these areas, and they spent considerable time editing digital images and designing website to host their projects. Their progress was fast, and their skills were fully demonstrated in their finished products (See Appendix C).

Research question 3

What impact does the Living History Online Project have on students' attitudes toward computers?

The Living History Online Project didn't seem to have much impact on students' attitudes toward computer technology, a finding confirmed by survey data that revealed no significant changes in students' attitudes toward computers. The

explanation for this lies in the fact that the students already had positive attitudes toward computer technology prior to the Living History Online Project. As shown in Table 19, a high percentage of "positive" could be found in both the pre and post surveys for all the items in the section of attitudes toward computer technology:

Item 26: I enjoy doing things on the computer (97%).

Item 27: I am tired of using a computer (9%).

Item 28: It is important to learn how to use computer (86%).

Item 29: It is difficult to learn how to use a computer (5%).

Item 30: I feel comfortable learning about computer technology (84%).

Item 31: I feel nervous using a computer (5%).

Item 32: I like to work alone on the computer (80%).

Item 33: I like to work with other people on the computer (61%).

Item 34: I like to see my work on the website (72%).

Item 35: I like to read my classmates' work on the website (69%).

This finding shows that the digital generation has already embraced computer technology. To many of the students who participated in the Living History Online Project, computer technology has already become part of their life.

Research question 4

What impact does the Living History Online Project have on students' attitudes towards history learning?

The Living History Online Project didn't appear to have much of an impact on students' attitudes toward history learning, either. The data results from the survey showed no significant change in students' history attitudes from the pre survey to the

post survey. The same reason for students' attitudes toward computer technology applies to their attitudes to history learning. It is because the students already had positive attitudes toward history learning before they started this project. A high percentage of "positive" responses could be found in both pre and post survey for many of the items in this section, too:

Item 38: I like to find out about the past (69%).

Item 40: I like to visit historic sites (70%).

Item 41: I like to visit history museums (66%).

Item 42: I like to read books about people and events in the past (56%).

Item 44: I like to do research about people and events from the Internet (63%).

Although there was no statistically significant changes in students' attitudes toward history learning, a considerable number of students (22%) did change from negative to positive between the pre and post surveys in item 45: "I like to do history projects", which indicated the effectiveness of the Living History Online Project to some degree.

However, quite a number of students (53%) agreed that "history is boring" (Item 37), and many students (42%) were not so enthusiastic about "remembering dates and names in history learning" (Item 39).

Research question 5

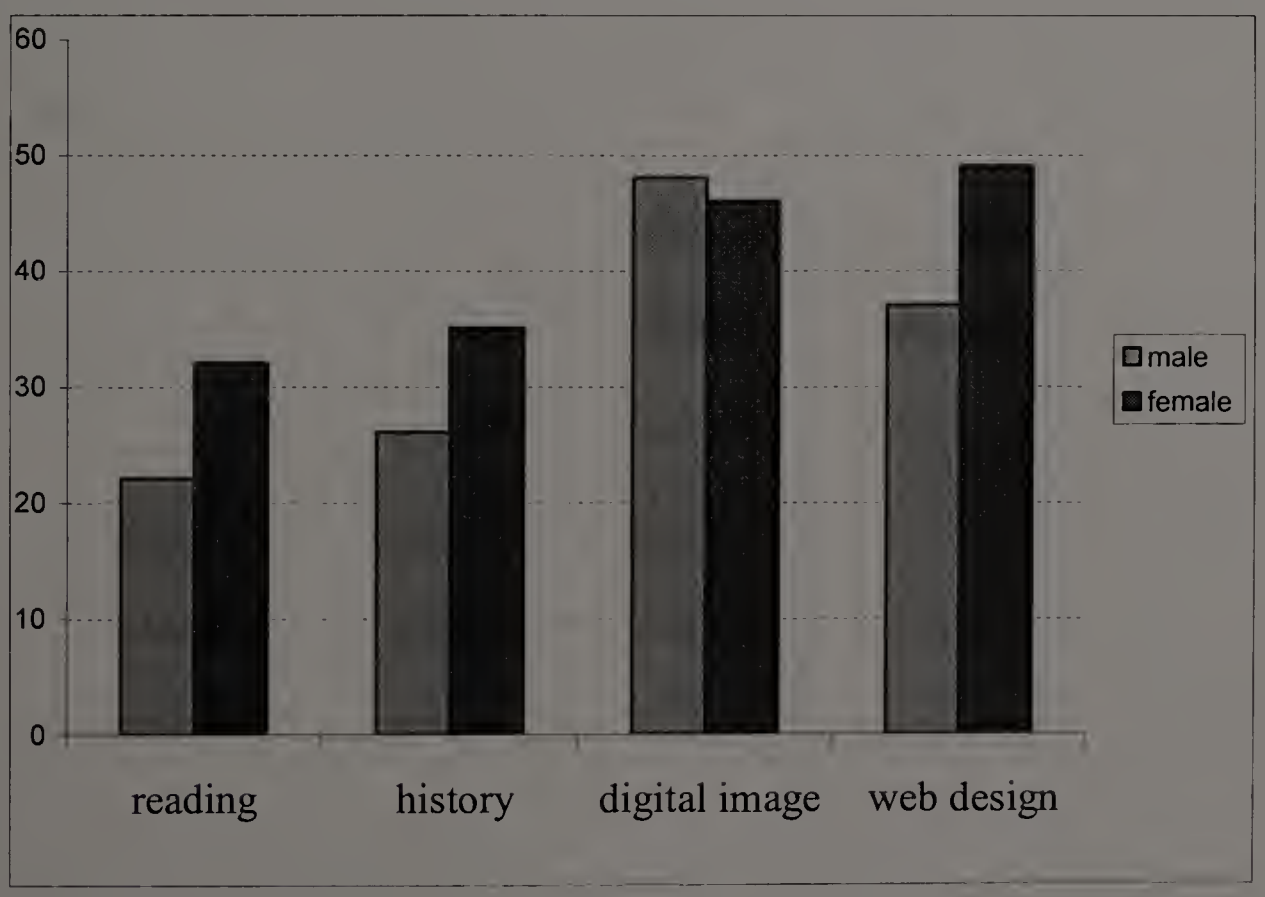
Does the Living History Online Project have a different impact on male and female students in computer use, skills and attitudes toward computer technology and history learning?

Much has been written about gender differences as they relate to learning styles with computers, computer software use and entry into the computer technology fields. Each of these factors has contributed to stereotypes, with male being characterized as computer savvy while females are often characterized as more reluctant to embrace technology.

The findings from this research data revealed some gender differences in computer use, skills, and attitudes toward computer and history learning.

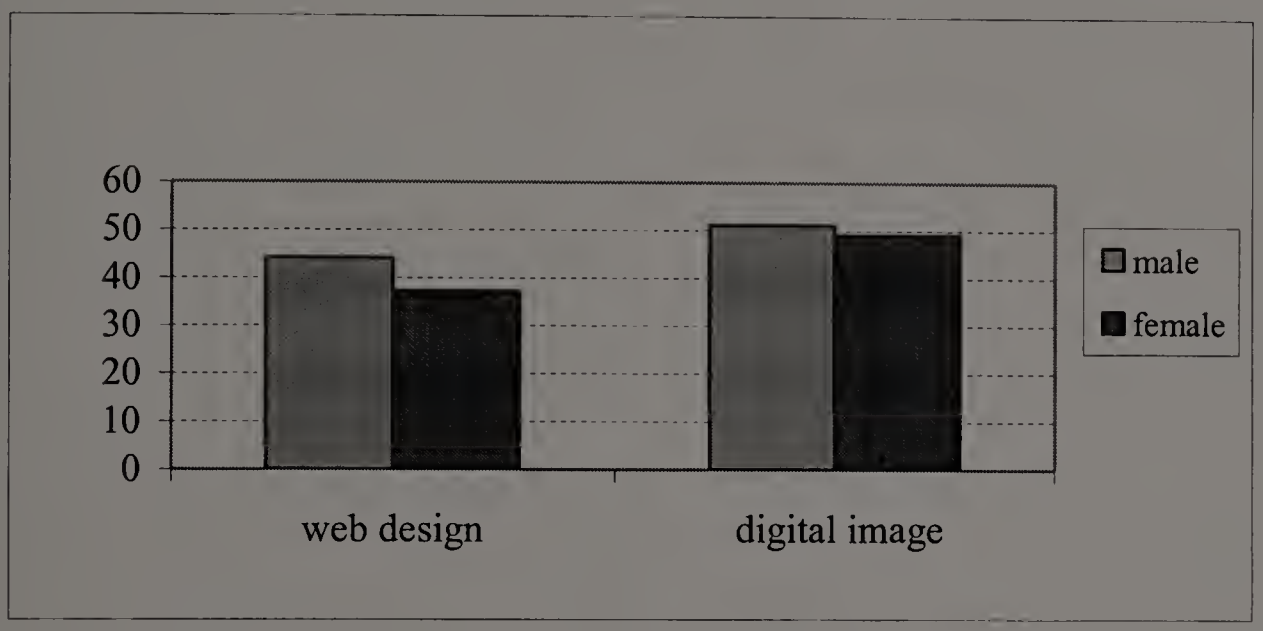
As shown in Figure 1, for the four significant different items, more female students changed from "non-user" to "user" between the pre and post surveys than male students in using computers for reading, history, and web design. Male students only slightly outnumbered female students in using computers for digital image editing.

Figure 1: The gender differences in computer use between the pre and post surveys



As for the two items that showed significant differences in computer skills between the pre and post surveys, the change for the male students was slightly higher than the female students in using computer for web design and digital image editing (Figure 2).

Figure 2: The gender differences in computer skills between the pre and post surveys



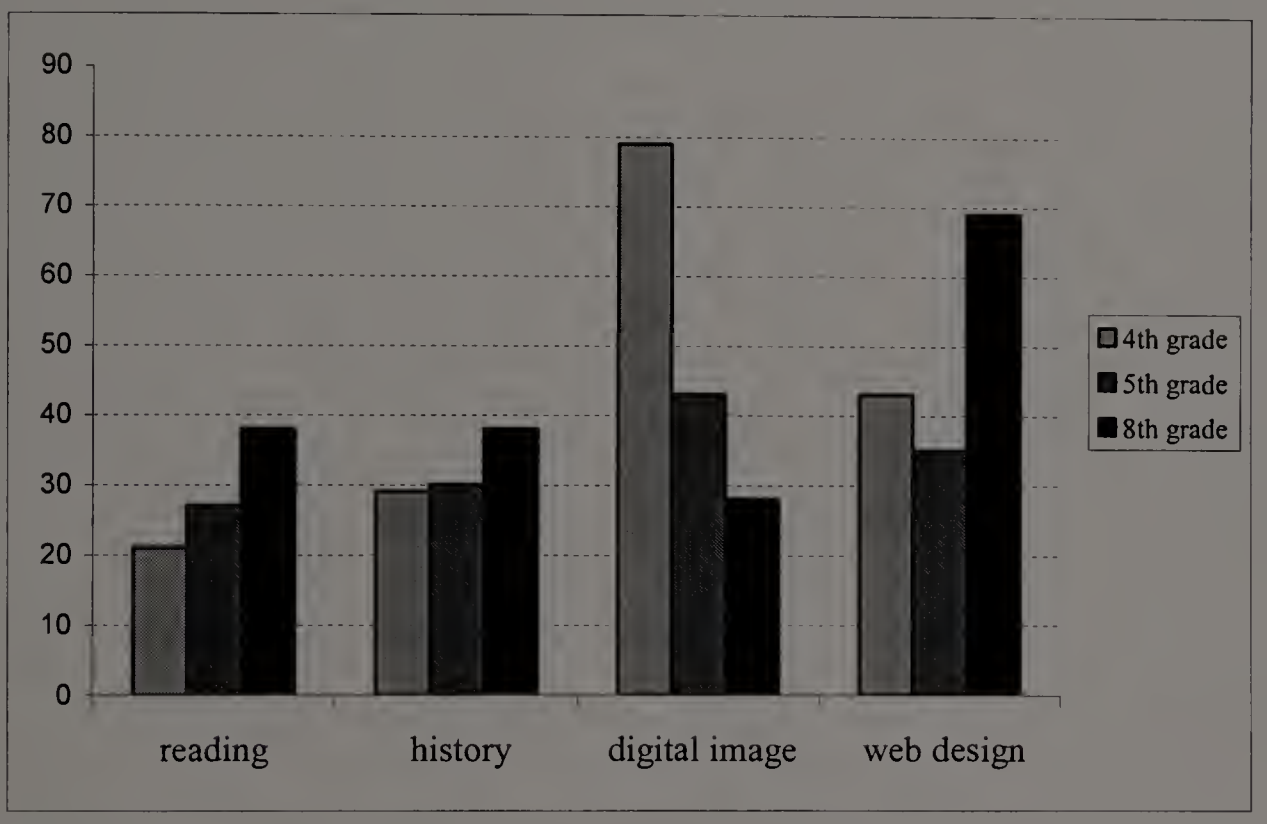
Research question 6

Does the Living History Online Project have a different impact on grade levels in computer use, skills and attitudes toward computer technology and history learning?

As shown in Figure 3, there are grade level differences in computer use. More 8th grade students changed from "non-user" to "user" between the pre and post surveys than the 4th and 5th grade students in using computers for reading, history, and web design. However, the change for the 8th grade students was the least among the three groups in using computers for digital images. The explanation for this might lie in the fact that the older students have been exposed to computers longer than the younger students, and they have used computers more for their academic

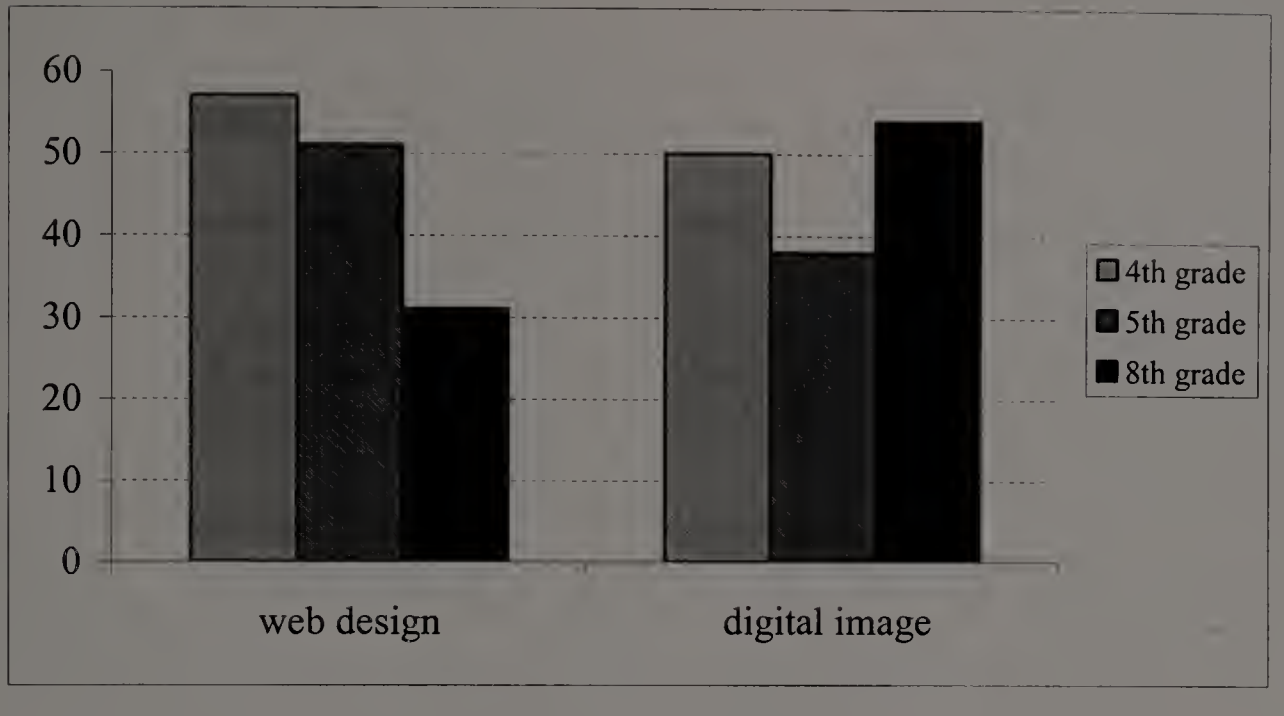
learning. On the contrary, the 4th grade students had the most change in using computers for digital images and comparatively smaller changes in reading, history and web design. These results might be due to the fact that the younger students were more interested in the computer as a form of entertainment.

Figure 3: The grade level differences in computer use



The data also showed differences in students' computer skills (Figure 4). While the 8th graders changed the most in working with digital images, they made the least change in their web design skills. The 4th graders made the most change in web design, while the 5th graders' change remained in the middle for both items. These results indicated that the older students were more capable of learning the complicated image editing skills, while the younger students demonstrated greater ability in mastering the web design skills.

Figure 4: The grade level differences in computer skills



In terms of both gender and grade level, the overall comparison of changes in computer skills, as well as attitudes toward computer technology and history learning is illustrated in Figure 5, 6 and 7 respectively.

Figure 5: Changes in computer skills for boys and girls in 4th, 5th, and 8th grade

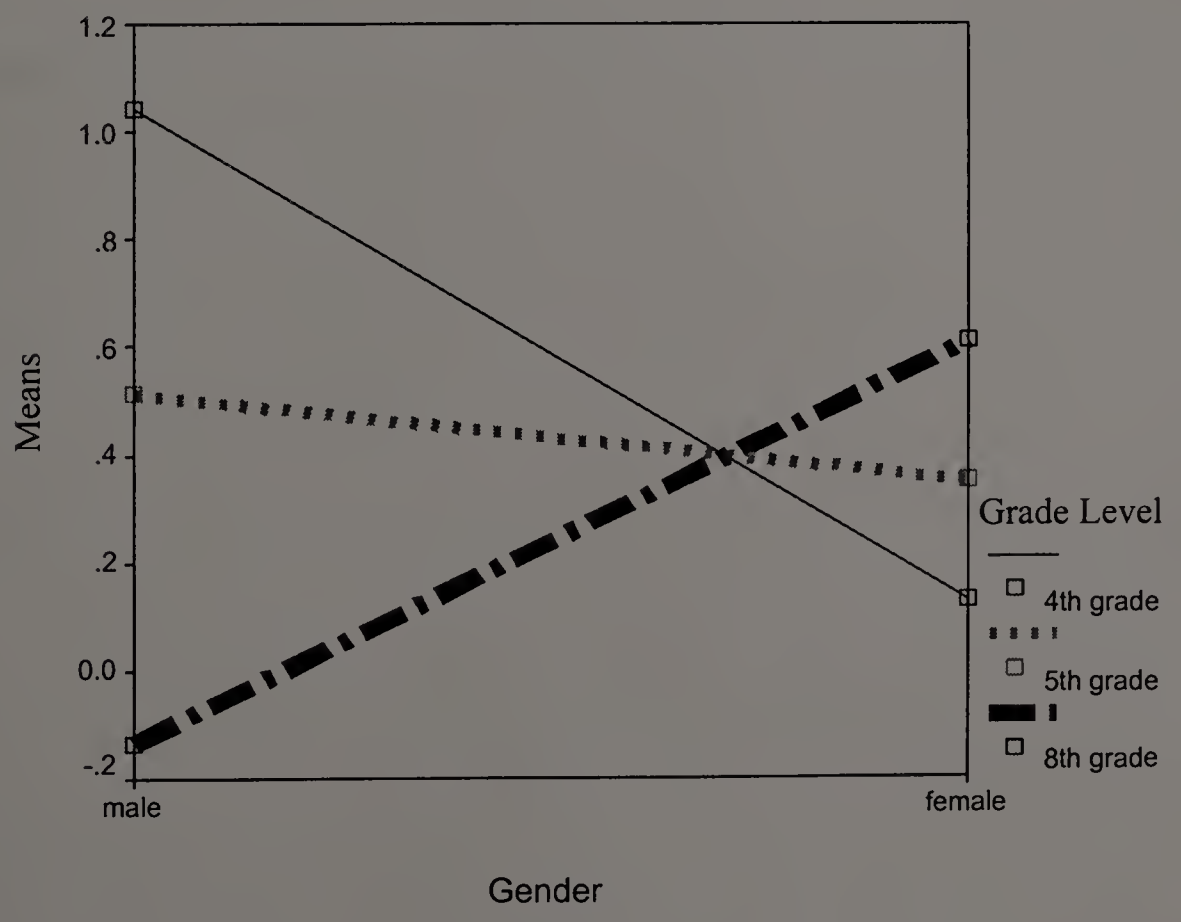
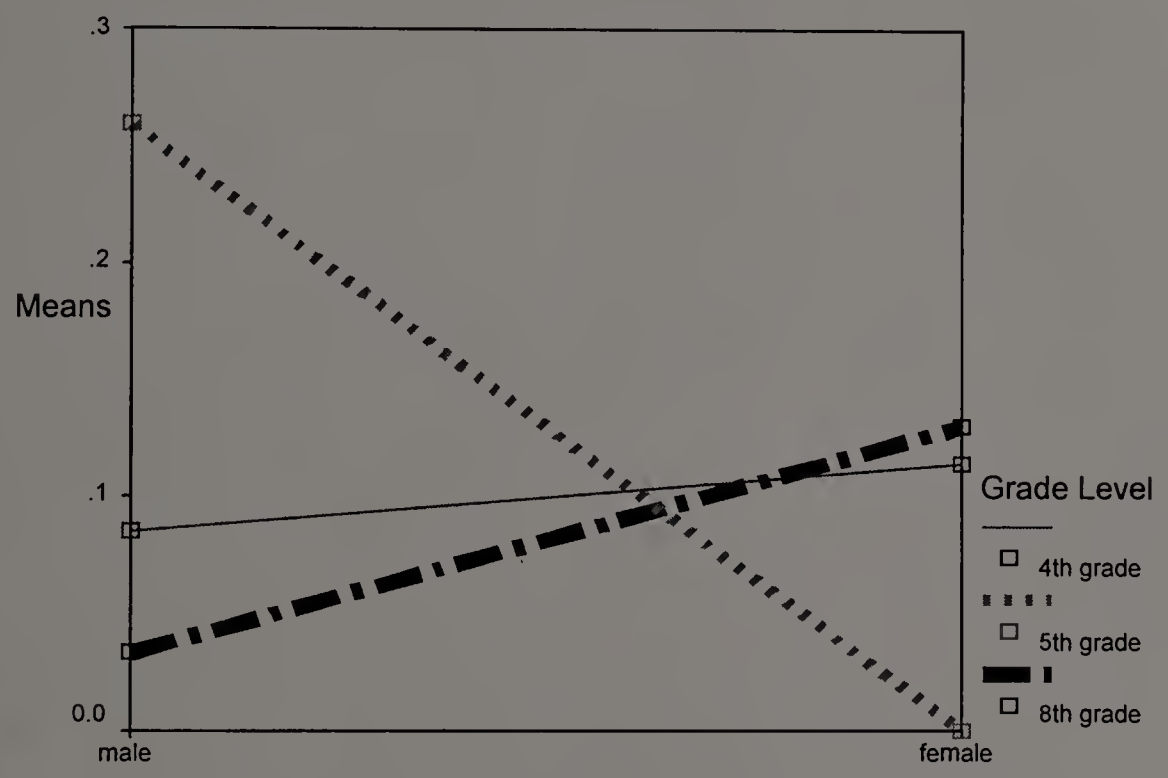


Figure 5 shows that the change for 4th grade boys was higher than girls in computer skills, while in the 8th grade, the girls' change was higher than the boys'. But the change in the 5th grade boys and girls was almost the same. The data showed an interesting trend in students' computer use: as girls got older, their skill level went up. But for boys, as they got older, their skill level went down.

Figure 6: Changes in students' attitudes toward computer technology for boys and girls in 4th, 5th, and 8th grade



Hardly any differences appeared for the 4th grade boys and girls between the pre and post surveys in their attitudes toward computer technology. However, 5th grade boys' attitudes changed the most from "negative" to "positive", and their change was much higher than their female peers, who didn't change at all. As for the 8th graders, an opposite trend could be seen in that more girls changed from "negative" to "positive" than their male peers. This indicates that the younger the

boys were, the more positive attitudes they had, whereas for girls, the older they got, the more positive their attitudes toward computer became.

Figure 7: Changes in students' attitudes toward history learning for boys and girls in 4th, 5th, and 8th grade

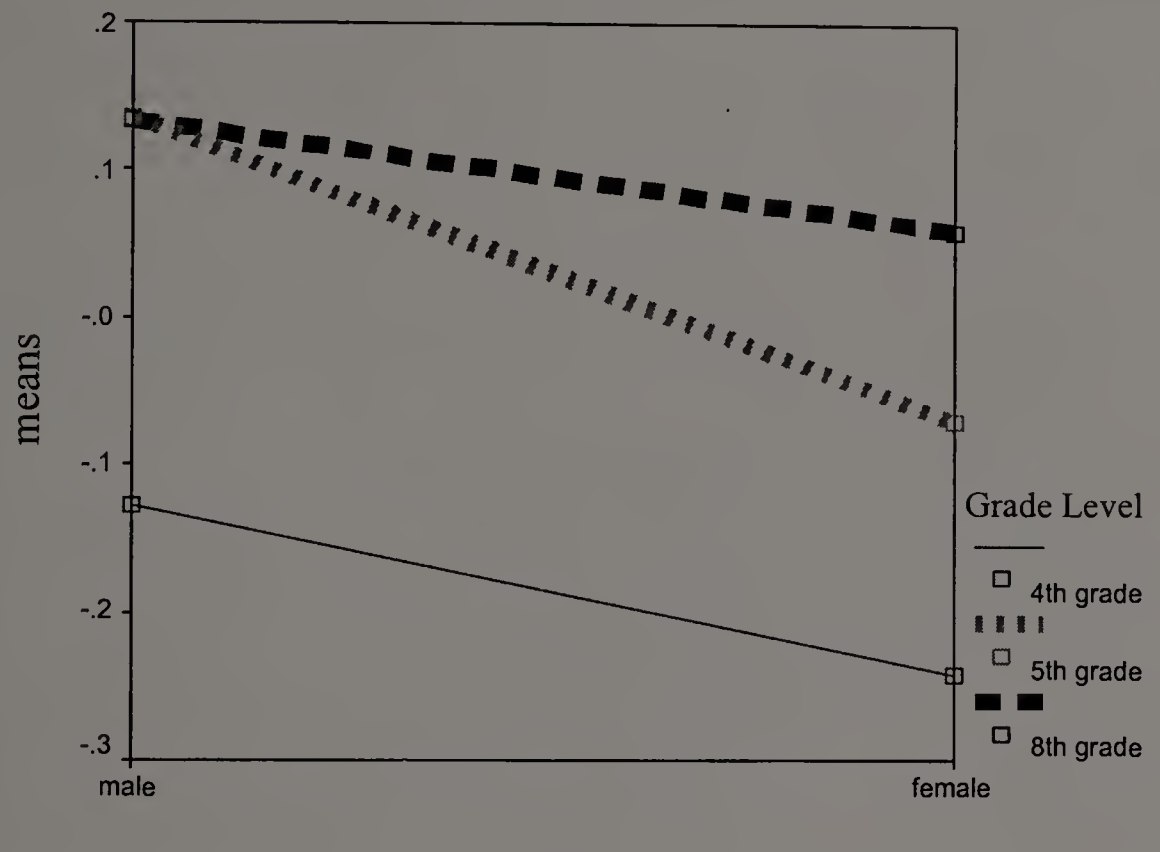


Figure 7 shows the clear trends for the changes of students' attitudes toward history learning. Overall, more boys than girls in all the grade levels changed from negative to positive. The change for boys in the 5th and the 8th grades was exactly the same. Moreover, this change seemed to coincide with the age of the students. Older students had more positive attitudes toward history learning than younger students.

Research question 7

How does having a computer at home affect the students' computer use, skills and attitudes toward computer technology and history learning?

The demographic data revealed that most of the subjects (96%) in this study had computers at home. Therefore, the variable of access to computer was not further studied. However, having a computer at home certainly had a positive influence to students' computer use, skills and attitudes toward computer technology.

Research question 8

Does English as the first language play a role in students' computer use, skills and attitudes toward computer technology and history learning?

Findings from the demographic data showed that most of the students (91%) in this study speak English as their first language. Again, there were not enough numbers to make a comparison, and this research question couldn't be pursued at this time.

Conclusion

The findings that computer attitudes were best predicted by computer access, frequency of computer use, computer skills was not surprising and was consistent with the findings of Riggs and Enochs (1993), Olivier and Shapiro (1993), King (1995), and Proctor and Burnett (1996). As with many other areas, practice makes a difference in one's skills and attitudes. Nonetheless, these findings also have implications for policy decisions. If students develop their attitudes and opinions about computer use in part from the experiences and exposure they have to such technology, it is important for schools to develop a computer-related curriculum and training programs that allow students to develop stronger computer skills and practice using these skills in meaningful ways.

Overall, the Living History Online Project had a significant impact on students' computer use and skills but showed no significant changes from the pre to post surveys on their attitudes toward computer technology or history learning. This could be explained by the pre survey data, which showed that the students already had a positive attitude toward computer technology and history learning prior to participation in the project. However, most of the students did agree that the Living History Online Project made history learning more interesting, and they enjoyed doing the projects on local history.

The data results showed differences in gender and grade levels. The trend for computer skills indicated that as girls got older their skill level went up, but as boys got older, their skill level went down. The same trend was also reflected in students' attitudes toward computers. The 8th grade girls showed more positive attitudes than the 4th and 5th grade girls, while the 8th grade boys had less positive attitudes than the 4th and 5th grade boys. As for students' attitudes toward history learning, the older students had more positive attitudes than the younger students.

To sum up, the most important contribution of the Living History Online Project is in that, by participating in the Living History Online Project, the students not only learned a lot about the local history, but also improved their computer skills, especially in designing websites, editing digital images, doing research on the Internet. Students, even 4th graders, could learn sophisticated computer technology, such as designing websites and manipulating digital images. Their online projects provide valuable information for the local history such as events, people and buildings.

Other contributions could be found in the role change of the teachers and the student-centered learning environment. The use of computer technology changed the role of the teacher from expert to facilitator or coach. It increased student-teacher interaction. Sometimes, teachers even became learners themselves, and students confidently shared their knowledge and skills with their teachers. The computer technology also made it possible for a student-centered learning environment supported by constructivist teaching methods. Students worked in small groups of two or three, with each student having a specific task within the group. In this classroom setting, students improved their computer technology competencies in Internet research, website development, word processing and image manipulation. When using computer technology, students felt more successful in school, were more motivated to learn and had increased self-confidence and self-esteem.

The final contribution of the project is the use of primary sources for history learning instead of the traditional textbooks and teachers' lectures. The hands-on activities of interviewing and photographing to find useful information during field trips to the historical sites enabled students to become more active learners and more enthusiastic about history learning. The Living History Online Project also helped the students to create history projects that meet local and state standards.

Recommendations

For further research, attempts should be made to replicate the results of this study using students of a random sample but with a larger number of students. A

long-term study that serves to follow-up on students' attitudes would provide information on whether or not attitudes change as students are exposed to projects that are less computer-enhanced. A study to compare computer attitudes of white versus non-white students should be conducted.

Additional studies should include more information on the socioeconomic status of the students, such as family income and parental educational levels, which would be helpful in determining the relationship between economic factors and the digital divide.

The history of computers in schools is not long, but in a few decades computer technology has become a staple in the classroom. Computer technology can aid instruction when student and teacher are comfortable with the ways computers function. With the globalization of the world and the free exchange of ideas, it is important to continue the research into children's attitudes toward computer technology so that they can use computer technology effectively and achieve higher levels of knowledge and skills in schools.

APPENDIX A

CONSENT LETTER

Dear participant,

I am a doctoral student in the School of Education at the University of Massachusetts, Amherst. I am working with The Center for Computer-Based Instructional Technology on the Living History Online Project to examine the impact of a local history project on the students' computer use, skills and their attitudes toward computer technology and history learning.

To determine the efficacy of the project, I have developed a student computer survey that would be distributed at the start of the project, and at its conclusion. I will also observe classes and conduct informal interviews. Some of the data and the students' work from this research will be included in my dissertation.

Your participation for this research is greatly appreciated. However it is voluntary, and you may withdraw from the research at any time. Data from the research will remain anonymous. No students' names will be used in any write up. Your completion of the survey is understood as an agreement to the above conditions.

If you have any questions regarding this research, please contact me by email at weijial@educ.umass.edu.

Researcher: Weijia Li

Date: January, 2003

APPENDIX B

STUDENT COMPUTER SURVEY

The Living History Online Project

Part 1. Computer Use	Never	Rarely	Occasionally	Regularly	Always
1. Use computers at school.					
2. Use computers at home.					
3. Use computers for reading.					
4. Use computers for writing.					
5. Use computers for math.					
6. Use computers for history.					
7. Use computers for games.					
8. Use email for communication.					
9. Use Internet for research.					
10. Use digital cameras for images.					
11. Use video tapes for learning.					
12. Use computers for web design.					
13. Use educational software for learning.					
14. Use PowerPoint for presentations.					
15. Use a library database to find sources for learning.					

Part 2. Computer Skills	Excellent	Above Average	Average	Below Average	Never Used
16. Use email to open or send electronic attachments.					
17. Use Microsoft Word for writing.					
18. Use computer software for website design.					
19. Use PowerPoint to create presentations.					
20. Use digital camera to get images.					
21. Use Internet to do research.					
22. Use a library database to find sources for learning.					
23. Enter data into a computer database.					
24. Use scanners to get learning materials.					
25. Use software to edit images.					

Part 3. Computer Attitudes	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
26. I enjoy working on the computer.					
27. I am tired of using the computer.					
28. It is very important to learn how to use a computer.					
29. It is difficult to learn how to use a computer.					
30. I feel comfortable learning about computer technology.					
31. I feel nervous using a computer.					
32. I like to work alone on the computer.					

33. I like to work with other people on the computer.					
34. I like to see my work on the website.					
35. I like to read my classmates' work on the website.					

Part 4. History Attitudes	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
36. I enjoy learning history.					
37. History is boring.					
38. I like to find out what happened in the past.					
39. I don't like to remember dates and names in history learning.					
40. I like to visit historic sites.					
41. I like to visit history museums.					
42. I like to read books about people in the past.					
43. I like to do research about people and events from primary sources.					
44. I like to do research about people and events from the Internet					
45. I like to do history projects.					

Part 5. Demographic Information

1. Grade Level: _____
2. I am a boy girl
3. Do you have a computer at home? Yes No
4. Is English your first language? Yes No

End of the survey
Thanks for the cooperation

APPENDIX C

STUDENT PROJECTS

1. Amherst Wildwood Elementary School: Shays' Rebellion

http://www.arps.org/amhersthistory/Shay's Pages/Shay's Index/Shay's index.htm

Shays' Rebellion

Researched and Created by Mr. Owen's 5th Grade
Class 2002-2003
Wildwood Elementary School
Amherst, Massachusetts

Causes Battles
People Sites
Court Closings Immediate Results
Celebrations/Retrospectives

About the Project Bibliography About the Authors

Opening Windows on the Past

Student created websites that explore Western Massachusetts history.

2. Pelham Elementary School: The Pelham Town Hall

http://www.arps.org/pe/Pelham/index.htm

The History of the Pelham Town Hall Complex

as presented by Pelham School's 4th graders

Shays' Rebellion (learn how Shays' Rebellion relates to Pelham history)

Early Pelham History

Architecture of the Pelham Town Hall

Uses of the Complex - changes over time

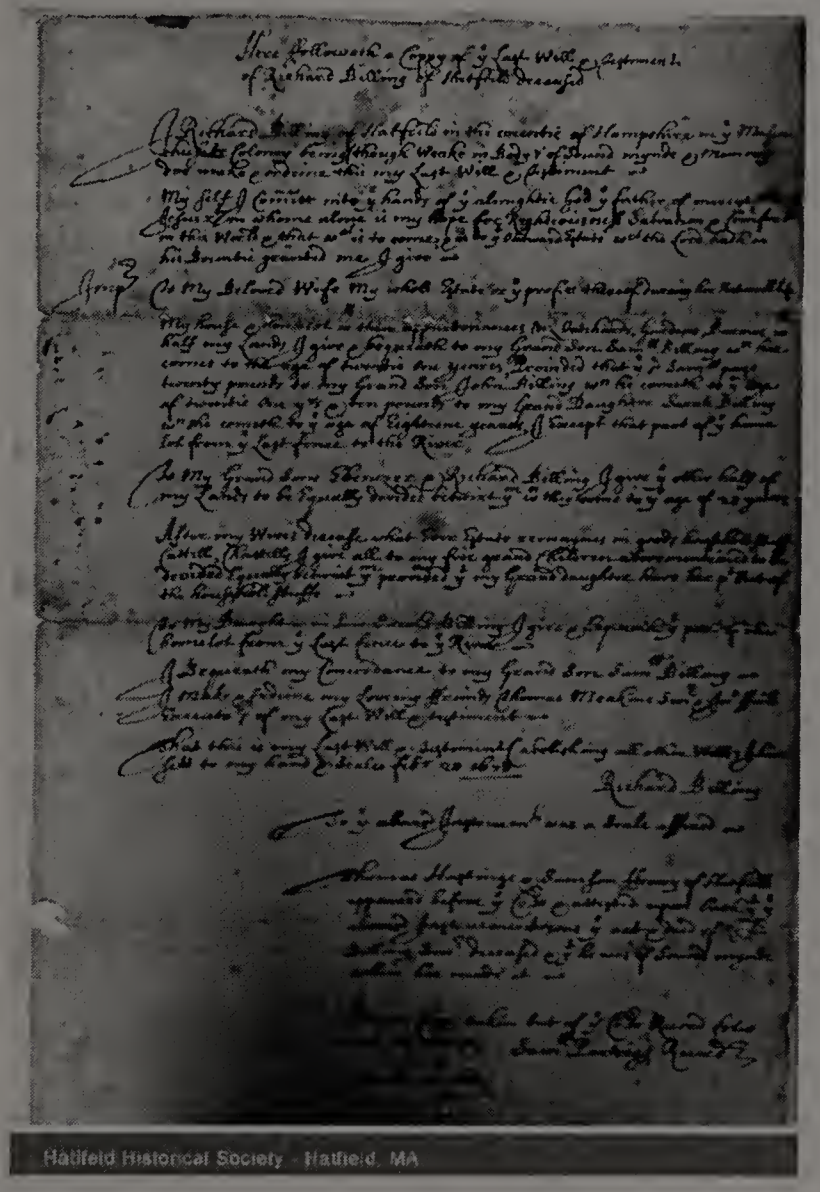
Pelham Hill Cemetery

Church

3. "Hatfield in Perspective" website, Hatfield, MA

   http://www.hatfieldpublicschools.net/elementary/HIP/

A pre colonial look at the people in the town of Hatfield



- Group 1 Comparing Wills from the 1600's and the 1700's to Today
- Group 2 Dictionary of Old English Words
- Group 3 Life in Hatfield Then & Now
- Group 4 Examining Sam Billings' Will
- Group 5 Examining Sarah Tilton's Will
- Group 6 Examining Richard Billings' Will
- Group 7 Analyzing Artifacts found at the Hatfield Historical Society
- About this project

4. Springfield Chestnut Accelerated Middle School:

The Underground Railroad

selected resources at the Springfield Library

Hidden in Plain View: The Secret Story of Quilts and the Underground Railroad
by Jacqueline Tobin

His Promised Land: the Autobiography of John P. Parker, Former Slave and Conductor on the Underground Railroad
ed. by Stuart Sprague

Let My People Go: the Story of the Underground Railroad and the Growth of the Abolition Movement
by Henrietta Buckmaster

The Underground Railroad, a Record of Facts...
by William Still

Underground Railroad
by the National Park Service

The Underground Railroad in Springfield, Massachusetts
by Kathryne Burns

The Underground Railroad in Connecticut
By Horatio T. Strother

Roots of Resistance: A Story of the Underground Railroad

APPENDIX D

LIVING HISTORY ONLINE PROJECT OUTLINE

How do historians study history? Not with textbooks and encyclopedias, but with primary source materials like census records, birth certificates, letters, maps, archival photographs and newspaper clippings. These documents allow historians to analyze events and create their own interpretations that are not filtered by another viewpoint. Guiding Principle Two of the proposed draft of the History and Social Studies Frameworks in fact states that students should delve into these kinds of primary source materials and "learn to draw conclusions logically from available evidence." Living History Online Project proposes to give the teachers and students from several communities the skills and knowledge to access primary source materials that they will then use to research some aspect of their own community's history – events, people, or buildings. The students' work will serve as an entry point into a look at broader historical events, such as the shaping of Colonial America (Learning Standard 5.5) and Shay's Rebellion (Learning Standard 5.15). Ultimately, participating classes will create a website showcasing what they've discovered. The website will also serve as an online resource to others in the community. Support for the project will come not only from the Amherst Public Schools, which has seen 11 classes over the past two years create elaborate websites under the title *Opening Windows to the Past* (http://www.arps.org/amhersthistory/index.html), but will also come from the Center for Computer-Based Instructional Technology (CCBIT) at the University of Massachusetts. CCBIT has partnered with Amherst for the past two

years and will continue to provide both technical and content-based expertise for the new consortium of districts.

Teachers brought history to life by giving their students access to digitized versions of resources that were otherwise unavailable to the general public. The technology resource teacher from CCBIT then gave students lessons on using web-authoring tools so that they themselves could create the web pages that host their local history projects comprise: this infusion of technology proved to be both a motivating factor for students as well as a perfect vehicle for disseminating information to the world at large.

This grant is an opportunity to provide both the pedagogical and technical expertise necessary to make these kinds of inquiry-based, technology-rich local history projects possible on a broader scale. Monthly seminars were held in which the teachers will uncover and access primary source materials; create lesson plans that help instruct students on the differences between primary and secondary sources as well as identify differing perspectives and points of view; receive instruction on using technology tools such as scanners, digital cameras and web-authoring programs; access VES in order to communicate with one another; and reflect on the effectiveness of their lessons. As an outcome, all teachers will be expected to construct their own local history website with their classes, though the focus of study will depend upon local curriculum guidelines. Each school may decide upon a study of people, events, historic buildings or movements. Technical expertise will be provided by the technology resource teacher from Amherst, who has been trained in

the Project MEET model as a technology integration specialist, as well as the Center for Computer-Based Instructional Technology.

In addition, CCBIT will create an online guide that outlines, step-by-step, how to create such a local history project, mirroring the group's work. This document will exist in PDF format so that all teachers with access to the Internet will have the ability to replicate the project. The teachers participating in this grant will be asked to contribute lesson plans and ideas to this document.

Living History Online Teacher Timeline

Month	**Professional Development Activity**	**Benchmarks**
Sept.	• Initial meeting of Local History Online team; plan all other meeting dates • Explanation of project and what is expected of participants • Creation of student technology literacy rubric; creation of surveys	• Firm commitment made by teachers to participate
Oct.	• Explanation of primary v. secondary sources • Field trip with teachers to Jones Library Special Collections and/or to local historical society to see primary source material firsthand	• Completed student technology literacy rubric
Nov.	• Teachers begin composing unit plan on Local History Online topic	• Units are completed by Nov. 30. • Teachers identify building, event or person to be studied
Dec.	• Teachers conduct peer review of units • Technology skills workshop: A look at *Inspiration* software to help students plan their site	• Units reviewed using Coalition of Essential Schools Tuning Protocol • CCBIT staff create website accessible to Local History Online team that contains primary source artifacts

Jan.	• CCBIT staff co-teaches, models or observes a technology-infused lesson from unit • CCBIT staff continues to assist teachers in locating and digitizing local artifacts such as photographs, maps, letters, etc. • Technology skills workshop: Use of digital camera, scanner	• Teachers use cameras and scanner in their classrooms to teach a pre-identified lesson from their unit • Implementation of technology survey
Feb.	• Teachers continue to implement units • Team meets to discuss/compare progress • Technology skills workshop: Use of web-authoring tools	• Teachers begin implementing the web creation portion of unit with support from CCBIT staff
March	• Teachers discuss progress of project; bring an "alpha" version of website to monthly seminar for peer review	• Classes continue to work on website
April	• Technology skills workshop: Use of synchronous and asynchronous communication tools • Teachers plan opportunity for students from various classes to communicate about the project • Presentation at DOE Spring Conference	• Classes complete Living History Online websites, including a reflections page • Synchronous or asynchronous reflection occurs • Second surveys completed
May	• Team reviews online guide and makes final suggestions	• Online guide is published
June	• Final meeting to assess project	• Teacher reflections

Teacher Expectations/Responsibilities

- Pick a history topic that allows for primary source research and aligns with the state frameworks;
- Set up a field trip to a special collection or archive, such as the Jones Library
- Set up a field trip to a historically appropriate site, such as a building
- Determine with tech resource teacher from building what hardware and software purchases to make from the Digital Toolkit menu
- Create a "unit' with a set of objectives and a rubric
- Implement unit in the classroom
- Attend all meetings and workshops

Student Reflections

- How did you select the information to include? (What resources did you use? Why did you leave some information out?)
- How did you decide which media you would use to make your information clear?
- Who is your audience? How did you choose information and media to capture your audience's attention?
- How would you change your project for a different audience?
- What did you learn during this project?
- What did you like best about this project?
- What would you have done differently?

Rubrics for Group Work

Performance Element	Level 4	Level 3	Level 2	Level 1
Job Responsibilities	I perform many job responsibilities in my group I perform each job effectively	I perform two job responsibilities in my group I perform each job effectively	I perform one job responsibilities in my group	I do not perform job responsibilities in my group
Goal Setting	I help lead the group in setting goals	I always participate in group goal setting	Most of the time I participate in group goal setting	I rarely or never participate in group goal setting
Communication	I consistently encourage everyone to participate in group discussions. I always participate in group discussions.	I always participate in group discussions. I occasionally encourage everyone to participate in group discussions.	I occasionally participate in group discussions.	I rarely or never participate in group discussions.

Technology Skills

Adapted from the Web Site Design rubric at RubiStar (rubistar.4teachers.org)

Performance Element	Level 4	Level 3	Level 2	Level 1
Content Accuracy	All information provided by the student on the Web site is accurate and all the requirements of the assignment have been met.	Almost all the information provided by the student on the Web site is accurate and all requirements of the assignment have been met.	Almost all of the information provided by the student on the Web site is accurate and almost all of the requirements have been met.	There are several inaccuracies in the content provided by the students OR many of the requirements were not met.
Copyright	Fair use guidelines are followed with clear, easy-to-locate and accurate citations for all borrowed material.	Fair use guidelines are followed with clear, easy-to-locate and accurate citations for all borrowed material.	Fair use guidelines are followed with clear, easy-to-locate and accurate citations for most borrowed material.	Borrowed materials are not properly documented
Links (Content)	All links point to high quality, up-to-date, credible sites.	Almost all links point to high quality, up-to-date, credible sites.	Most links point to high quality, up-to-date, credible sites.	Less than 3/4 of the links point to high quality, up-to-date, credible sites.
Color Choices	Colors of background, fonts, unvisited and visited links form a pleasing palette, do not detract from content, and are consistent across pages.	Colors of background, fonts, unvisited and visited links do not detract from the content, and are consistent across pages.	Colors of background, fonts, unvisited and visited links do not detract from the content.	Colors of background, fonts, unvisited and visited links make the content hard to read or otherwise distract the reader.
Navigation	Links for navigation are clearly labeled, allow the reader to easily move from a page to related pages (forward and back), and take the reader where s/he expects to go. A user does not become lost.	Links for navigation are clearly labeled, allow the reader to easily move from a page to related pages (forward and back), and take the reader where s/he expects to go. A user rarely becomes lost.	Links for navigation take the reader where s/he expects to go, but some needed links seem to be missing. A user sometimes gets lost.	Some links do not take the reader to the sites described. A user typically feels lost.

APPENDIX E

MODEL CURRICULUM UNIT

1. Framework/strand
   History/Social Studies
   United States history, geography, economics and government from 1500 to 1820

2. Grade level: Fifth

3. What students should know and be able to do as a result

   - Analyze an artifact to determine its use and importance
   - Analyze a document to determine its use and importance
   - Determine if a document or photograph is a primary or secondary source
   - Synthesize research from primary sources into brief paragraphs that explain the importance of historical objects
   - Create a website with text, images and working links to display knowledge gained from research

4. Task (description of activities)

   The students in this fifth grade class studied artifacts and wills from the Hatfield Historical Society museum and produced a website detailing what they uncovered about their town's history through items, documents, photographs, cartoons and newspaper clippings. They compared the items listed in 17th and 18th century wills to items that exist today. The teacher created a set of lessons that lead a teacher through the process of making students aware of the difference between primary source and secondary source materials. Those lessons included:

   - A trip to the museum
   - An artifact analysis
   - A document analysis
   - A photograph/artwork analysis
   - A political cartoon analysis
   - A map analysis
   - An introductory lesson on primary source materials

5. Technology used

   - Internet
   - Web authoring software

6. Student technology competencies

- Internet research
- Website development
- Word processing
- Image manipulation

7. Inclusion

   All students participated in the project. Students worked in small groups of two or three and each student had a specific task within the group.

8. Student improvement

   As documented in our summative evaluation, there were minimal statistical gains in student attitudes towards use of technology in the classroom. However, there were significant changes from the beginning of the year to the end in terms of technological skills gained, such as use of a digital camera, use of computers for reading, use of a computer to design a website.

   In terms of students' attitudes towards history, there was not a statistical significance between beginning attitudes and those at the end of the project. However, a majority of students found website design as a skill to be useful. Coupled with a pronounced lack of interest in working on "history projects" generally, use of technology could potentially be one means of generating interest and therefore higher achievement ultimately.

APPENDIX F

FINAL REPORT FOR THE GRANT

No Child Left Behind Enhancing Education Through Technology
Model Technology Integration Grant (Fund Code 165)

DUE: September 8, 2003

School District: Amherst Public Schools

Partner(s): Springfield Public Schools, Hatfield Public Schools, Pelham School

I. FOCUS OF PROJECT

A. Core Academic Subjects Addressed by Project

Check the main focus subject area(s).

	English/language arts		Foreign languages
	Reading	X	History
	Mathematics		Civics and government
	Science		Economics
	Arts		Government

B. Instructional Technology Standards Addressed by Project

List technology literacy skills by number, referring to the *Massachusetts Recommended PreK-12 Instructional Technology Standards* (http://www.doe.mass.edu/edtech/standards/itstand.pdf). 1.7, 1.18, 1.25, 3.1, 3.15, 3.17

C. Sample Curriculum Unit

Select a model curriculum unit adopted and developed by a project participant. Provide information about the unit using the following headings:

1. Framework/strand
2. Grade level
3. What students should know and be able to do as a result
4. Task (description of activities)
5. Technology used
6. Student technology competencies
7. Inclusion
8. Student improvement

II. PROFESSIONAL DEVELOPMENT

A. Face-to-face Professional Development Offered (workshops, study groups, institutes, mentoring, etc.).

Date of Training	Number of Hours	Number of Teachers and/or Administrators Trained
1. Oct. 5, 2002	2	5
2. Nov. 7, 2002	2	7
3. Jan. 2, 2003	2	7
4. Feb. 6, 2003	2	6
5. March 6, 2003	2	5
6. June 3, 2003	2	5

B. Online Professional Development

Has the project utilized online professional development? Yes ____ No ___X__
If yes, complete the following:

Technology Used	
Duration of the Course	
Number of Participants	
Number of Hours for Each Participant	
Types of interaction (synchronous and/or asynchronous)	

C. Information on Participants Who Received Professional Development and Follow-up Activities

District	School	Grade Level/ Subject Area	Adopted Model in the classroom (Yes or No)	# of Students Impacted
Hatfield	Breor Elementary	Grade 5	Yes	18
Pelham	Pelham Elementary	Grade 4	Yes	17
Amherst	Wildwood	Grade 5	Yes	19
Springfield	Chestnut Accelerated Middle School	History/Social Studies	Yes	120
Amherst	Wildwood	Technology Resource	Yes	580
Amherst-Pelham	Pelham	Technology Resource	Yes	300
Hatfield	Breor Elementary	Technology Resource	Yes	300

III. ACQUISITION OF HARDWARE AND SOFTWARE

Hardware and software purchased with grant funds (Add additional lines if needed.)

Item	Quantity
Laptops	3
Desktop computers	4
Scanners	2
Digital Cameras	2
Wireless routers	2
Printers	2

IV. EVALUATION (Refer to materials provided at the Mid-Year Grant Recipient Workshop on January 28, 2003. The materials are posted at www.neirtec.org/activities/eval-planning.html)

A. Describe how the project's progress has been monitored, evaluated, and reviewed.

In order to evaluate the project, we worked with Dr. Robert Maloy from the University of Massachusetts School of Education and Weijia Li, a graduate student at the School of Education focusing on educational technology and research methods. Dr. Maloy, Ms. Li and Paul Oh, project coordinator, worked together to generate, then revise, a list of survey questions for students that focused on their technology skills, attitudes towards technology and learning, and attitudes towards history. Ms. Li made the surveys available to teachers who distributed them both prior to the start of the project and then afterward. The teachers were then responsible for collecting the surveys and giving them to Ms. Li, who compiled a report on the data gathered.

Teachers' progress in the project was monitored through regularly scheduled meetings, by site visits from the project coordination team, and by Weijia Li. A teacher's work was deemed "complete" after the unveiling of the student-produced website (example: "Hatfield in Perspective" http://www.hatfieldpublicschools.net/elementary/HIP/). Currently, three of the four teachers were able to complete their projects. The fourth plans to complete her project this fall.

B. Provide a detailed summative evaluation report:

- Evaluation question(s) – what you wanted to find out
- Methods and instruments used in the evaluation – such as questionnaires, focus group, observations, interviews, etc.
- Implementation of the evaluation, including the personnel involved

V. USE OF FUNDS

Check all the appropriate items to indicate how the district used the NCLB grant award. Percentages must total 100%.

	Items	Estimated Percentage of Funds
	Professional Development: Focus on technology use and skills	25 %
	Professional Development: Focus on integrating technology for instruction	32 %
	Online Professional Development, telecourses	
	Maintenance and Technical Support	
	Hardware	33 %
	Software and Online Resources	
	Evaluating Impact	
	Connectivity: Wiring and Infrastructure	
	Connectivity: Costs for Services	
	Administration and operation	6 %
	Other: please specify: Consultants developing an online guide for the project	4 %
		Total: 100%

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