Abstract for Pacific Circle Consortium 2006

But I'm already computer literate: Perspectives of 9th grade students

Thanh Truc T. Nguyen, University of Hawaii, nguyen@hawaii.edu

This paper presents perspectives of high school freshmen on the critical nature of the technology literacy reform effort in our nation's schools. School reform efforts in the United States have funded technology in response to the alarming realization that students are falling behind other nations in achievement and preparedness to be positive contributors to society. More than half of working adults in the U.S. use the computer at work, with strong evidence that adults who possess higher degrees and higher income experience more computer usage at work than those with no college degrees and lower incomes. After the Nation at Risk (1982) call to arms, business leaders at organizations such as IBM and Microsoft called for a revamping of American schools to better prepare students to become effective workers in the 21st century.

Among the many ambitions of the No Child Left Behind Act of 2001 (P.L. 107-110), a program entitled Enhancing Education Through Technology (EETT) was formed whose primary goal is to improve student academic achievement through the use of technology in schools. Yet, what is technological literacy since modern-day students seem to be mastering the use of computers and the Internet at home, not in schools? Various reports from the U.S. Departments of Education and Commerce even reveal that school-age children and adolescents use computers more readily than adults.

In this study, thirty-seven high school freshmen were surveyed at a charter school in the State of Hawaii about their perceptions of computer and technology skills as a life skill. The students had just completed their semester-long, new computer literacy curriculum. The survey asked students to consider their expertise and comfort levels before and after the class on various software applications and concepts including word processing, spreadsheets, email, and safety and ethics using computers. Following the survey students discussed the results including clarifying questions such as, “Do you think you need a formal Computer Literacy class? Do you think the skills learned and discussed will help you in your future careers?” Pre- and post-quiz assessments were also analyzed to assess gains.

Results indicate that students were not computer literate in terms of workforce-oriented computer tasks, yet were comfortable and well versed in the social aspect. Before the class, many students already considered themselves highly computer literate since they interacted frequently with video game consoles, MP3 players, cell phones, and chat rooms. Yet, students had difficulty in completing specific computer-related tasks such as formatting a word processing document, establishing formulas in spreadsheets, and properly distinguishing terms such as upload and download. There was a statistically significant increase in all software application areas and a statistically significant increase in perception of learning. All students in this study recognized that they lacked specific skills that were needed in their future careers and appreciated the chance to learn, practice, and improve upon skills attached to their chosen future professions. Overall, students broadened their definition of computer and technology skills as a life skill and expectations of productivity using computers and other technology.
Introduction

This paper presents perspectives of high school freshmen on required computer literacy classes, a result of the technology literacy reform effort in our nation's schools. School reform efforts in the United States have funded technology in response to the alarming realization that students are falling behind other nations in achievement and preparedness to be positive contributors to society. More than half of working adults use the computer at work ("Digest of Education Statistics, 2004," 2004), with strong evidence that adults possessing higher degrees and higher family income experience more the computer usage at work (75%) than those with no college degrees and low family incomes (30%). After the Nation at Risk (1982) call to arms, business leaders at organizations such as IBM and Microsoft called for a revamping of American schools to better prepare students to become effective workers in the 21st century.

The recent and much talked about No Child Left Behind Act of 2001, or NCLB, (P.L. 107-110) (United States Department of Education, 2001) has mandated that all U.S. students be computer literate by the eighth grade. A key objective of NCLB is to bridge the digital divide by ensuring every student is digitally literate regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.” Yet, what is technological literacy since modern-day students seem to be mastering the use of computers and the Internet at home, not in schools? Various reports from the U.S. Departments of Education and Commerce even reveal that school-age children and adolescents use computers more readily than adults. Do American students, who seem to be adept at electronic and computer usage, need a formal course in computer literacy?

Review of Literature
Technology has always been in schools. Textbooks and blackboards are arguably the most prevalent and successful forms of school technology. But other technologies, such as radio in the 1920s, film in the 1930s, and television in the 1950s, did not make sweeping changes and greatly impact school technology (Mehlinger, 1996). In the 1980s, educational administrators turned towards computer technology in the hope that it would offer convenience, cost and quality for increased flexibility in learner constituencies (Hülsmann, 1999).

Computers began to slowly appear in classrooms. Drill and practice were the norm for many years. But, placing students in front of the machines to press keys can be likened to rats pressing a bar for food pellets. Kepner (1986) cautioned that students, as well as staff and teachers, needed to learn appropriate uses of information processing on the computer and the impact of interpretation on society. Daniel (1999) even went so far to say that the public's assumption that technology-based teaching will foster learning and show productivity gains over classroom-based learning were false and that there would ensue widespread disappointment when people realize those perceptions were false. Nevertheless, the use of computers and the Internet by students is common and begins early. Even before kindergarten, a majority of nursery school children use computers, and 23% use the Internet (DeBell, 2005). In upper grade levels, nearly all students use computers and a substantial majority use the Internet (United States Department of Commerce, 2004).

Recognizing the exponential growth of computers in the workplace and in schools, the United States federal government applied a range of efforts towards the integration of technology into the K-12 curriculum. The goal was to develop information and technology literate students. The Secretary’s Commission on Achieving Necessary Skills in 1991 (SCANS) called for students to use computers to acquire, evaluate, interpret and communicate information (United States
Department of Labor, 1991). In 1992, *The Goals 2000: Educate America Act* called for educational technology leadership at both the federal and state levels to promote the use of technology to achieve educational goals. Then Secretary of Education Terrel Bell created the Task Force on Educational Technology in 1994 to explore how computers and other forms of technology could be used to “upgrade” American education. In the meantime, the Department of Commerce published a series of reports entitled *Falling Through the Net* in 1995, 1998, 1999, and 2000.

A more recent effort towards addressing the effective use of technology in schools was the Enhancing Education Through Technology Program (EETT), passed as part of No Child Left Behind Act of 2001 (P.L. 107-110) (United States Department of Education, 2001), a reauthorization of the Elementary and Secondary Education Act. The EETT strives to develop technological literacy in every student by the end of eighth grade, thereby closing the digital divide. The digital divide, as defined by Bolt and Crawford (2000), is a grim description of disparities in family socioeconomic status and technological access. The three major goals of the EETT program as defined by the U.S. Department of Education are to improve student academic achievement through the use of technology in elementary and secondary schools, assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability, and encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by state educational agencies and local educational agencies (United States Department of Education, 2001).
Research Questions

The research questions that guided this study were

1. Do students experience any gains in specific software applications usage a computer literacy curriculum?

2. How do students consider formal computer literacy courses helpful and relevant to their future careers?

3. How do students describe the impact of computers in their lives? A sub question is: Where do students learn about computers and computer usage?

Method

Quantitative research methods combined with document analysis were used to accomplish this study. The main data instrument was a survey to identify areas of self-perceived gain and relevancy. Its design was informed by the study's research questions. The survey was administered via the World Wide Web towards the end of the school year. Students who completed the survey were given a fruit snack and note pads as tokens of appreciation. A pre-assessment quiz was given to all students on the second day of class. The post-assessment was divided into three separate quizzes given throughout the semester. Student work and quiz scores were reviewed and analyzed to assess gains.

Context

The school site is a Hawai‘i New Century Public Charter School. The school asserts two interlocking missions: to provide a quality education to its students, and to serve the educational research and development community as an inventing and testing ground for high quality curriculum and instruction. The school serves about 420 students in kindergarten through grade twelve representing the full range of the state's children in ethnicity, socio-economic status, and
academic achievement. The school is the only school in Hawai‘i with the mission of supporting educational research, curriculum development and dissemination of educational materials and school improvement strategies. As a real-world laboratory, new educational ideas and courses get their early development and trials in the school.

As this is a special focus school of choice, parents must be willing to accept the mission of the school and agree that their child will participate in all components of the school program. All products produced by students, imagery of all types, and data concerning students shall belong to the school and may be used by the school for, among other things, research, publication, dissemination, and recordings.

The computer literacy course is a mandatory one-semester course for all ninth graders at the school. The 2005-2006 school year was the second year that the course was required, but the first year that the course syllabus was aligned to National Education Technology Standards for Students (2002). Though the State of Hawaii Department of Education adopted a commercial computer literacy curriculum for eighth graders, the charter school chose not to utilize the curriculum due to the stringent nature of their course of study for their eighth graders. Instead, this computer literacy course was developed to be aligned with the course of study for ninth graders. The principal and vice-principal of the school intends for the course to be taught at the eighth grade level in subsequent years to meet NCLB mandates.

Participants

Fifty-one ULS 9th grade students were surveyed about their perceptions of computer and technology skills as a life skill. One class of 26 students was given an entire period in their computer literacy class to complete the online survey. The other class of 25 students, who had already completed computer literacy and were enrolled in Health at the time of the survey, was
sent an email directing them to the online survey. Announcements were made in the Health class to encourage participation. Thirty-seven completed surveys, 16 males (43%) and 26 (57%) females, were submitted for a 73% return rate. The students had all just completed a semester-long, new computer literacy curriculum.

**Instrumentation**

The 37-item survey was developed by the researcher for this study. The survey was piloted with two 10th grade students and reviewed by learning technology personnel at the school. The survey asks students to consider their expertise and comfort levels before and after the class. Questions focused on various software applications and concepts including word processing, spreadsheets, email, and safety and ethics using computers. Students were also asked seven open-ended questions such as, ‘Do you think that Computer Literacy class is/was important to help you in your future careers?’ and ‘Imagine that you no longer had computers. How would that impact your life? Your schoolwork?’ The survey instrument was uploaded into a commercial survey mechanism on the World Wide Web. Students all took the survey using computers and a high-speed Internet connection.

A non-graded, pre-quiz was administered to all students on the second day of class. The purpose of the quiz was to assess the level of student knowledge about computers as well as the skill set that students possessed in word processing, spreadsheets, web authoring, and presentation development. Email and Internet research were not assessed since students did not yet have Internet or an email account to use. Students were actually given two days to complete the pre-assessment. However, all students completed and turned in their work as best they could by the end of the second day of class. Three additional quizzes were administered throughout the
duration of the semester-long course. The pre-assessment and quizzes were not designed as
criterion-referenced test items, so specific comparisons cannot be made.

Results

Research Question One

Research question one was “Do students experience any gains in specific software
applications in a computer literacy curriculum?” Results from the online survey and quiz
achievement scores were analyzed to best answer this question.

Paired sample t-tests were conducted on survey feedback to evaluate the impact of the
computer literacy class curriculum on student self-perception of learning in seven different areas.

There was a statistically significant increase in all software application areas from before the
class to after the class as seen in Table 1.

Table 1 Paired Samples Statistics and Paired Differences of before and after impressions of software
applications, research on the Internet, and safety and ethics. 1=don’t/didn’t know anything, 5=am really good
at it.

<table>
<thead>
<tr>
<th>Software Application</th>
<th>Before Mean</th>
<th>Before N</th>
<th>Before SD</th>
<th>After Mean</th>
<th>After N</th>
<th>After SD</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Process</td>
<td>4.14</td>
<td>36</td>
<td>1.02</td>
<td>4.78</td>
<td>36</td>
<td>0.42</td>
<td>-5.30</td>
<td>35</td>
<td>0.000</td>
<td>0.45</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>2.42</td>
<td>36</td>
<td>1.13</td>
<td>4.33</td>
<td>36</td>
<td>0.63</td>
<td>-12.27</td>
<td>35</td>
<td>0.000</td>
<td>0.81</td>
</tr>
<tr>
<td>Web Authoring</td>
<td>1.75</td>
<td>36</td>
<td>1.08</td>
<td>3.83</td>
<td>36</td>
<td>1.03</td>
<td>-9.82</td>
<td>35</td>
<td>0.000</td>
<td>0.73</td>
</tr>
<tr>
<td>Email</td>
<td>4.17</td>
<td>36</td>
<td>1.23</td>
<td>4.83</td>
<td>36</td>
<td>0.38</td>
<td>-3.94</td>
<td>35</td>
<td>0.000</td>
<td>0.31</td>
</tr>
<tr>
<td>Presentation</td>
<td>3.08</td>
<td>36</td>
<td>1.42</td>
<td>4.36</td>
<td>36</td>
<td>0.80</td>
<td>-5.37</td>
<td>35</td>
<td>0.000</td>
<td>0.45</td>
</tr>
<tr>
<td>Research</td>
<td>4.47</td>
<td>36</td>
<td>0.77</td>
<td>4.75</td>
<td>36</td>
<td>0.44</td>
<td>-2.53</td>
<td>35</td>
<td>0.016</td>
<td>0.15</td>
</tr>
<tr>
<td>Safety</td>
<td>3.11</td>
<td>36</td>
<td>1.39</td>
<td>4.61</td>
<td>36</td>
<td>0.65</td>
<td>-7.05</td>
<td>35</td>
<td>0.000</td>
<td>0.59</td>
</tr>
</tbody>
</table>

In word processing, there was a statistically significant increase in self-reported learning
from before the class \[M=4.14, SD=1.02\] to after the class \[M=4.78, SD=0.42, t(35)=-5.30,\]
p<.0005. The eta squared statistic (.45) indicated a large effect size. In the course, students were
asked to compose letters, create newsletters and flyers with images, and format bibliographies to
demonstrate their word processing skills. A pre-assessment of student skills showed that majority
of the students could type well into a word processing program, indent the first line of
paragraphs, and right justify their names in the upper right corner of the page, a standard format for many typed assignments. However, when asked to adjust page margins, tabs, insert tables, modify images, and format borders, students were at a loss. Six students commented that they improved the most in word processing, citing tables, tabbing, and image manipulation as the most helpful areas. However, another ten indicated that they improved the least in word processing, calling it “basic” and “good for reports only.” Scores on quizzes administered during the school year showed improvement in table formatting, bulleting and numbering, image positioning, and tab setting.

In spreadsheets, there was a statistically significant increase in self-reported learning from before the class \(M=2.42, \text{SD}=1.13\) to after the class \(M=4.33, \text{SD}=0.63, t(35)=-12.27, p<.0005\), the largest mean gain in all of the software applications areas. The eta squared statistic (.81) indicated a large effect size. Eleven students specifically indicated that they gained the most knowledge and understanding in spreadsheets. Prior to the course, students could not define parts of a spreadsheet, enter formulas, or manipulate raw data to create graphs. Scores on quizzes administered during the school year showed marked improvement in all the aforementioned skills, increasing from 24% passing to 94% (N=51) of the students. The 6% of students who did not pass the spreadsheet-related portion on quizzes were students who were frequently absent due to extra-curricular obligations. One student shared that she “improved most in spreadsheets because I never knew what that was before and now I learned a lot on how to make a spreadsheet [sic], recording data, and making pie charts and bar graphs.”

In web authoring, there was a statistically significant increase in self-reported learning from before the class \(M=1.75, \text{SD}=1.08\) to after the class \(M=3.83, \text{SD}=1.03, t(35)=-9.82, p<.0005\), the second largest mean gain in all of the software applications areas. The eta squared
statistic (.73) indicated a large effect size. Only three students had ever authored a web page without the use of automatic services like that offered by Yahoo and MSN. Students struggled with the HTML coding, but were very savvy with transferring their word processing skills into the visual interface of the web authoring software. Management of file structures was observed to be the most difficult aspect of web authoring. Of particular interest to the researcher was that the students with the neatest binders had that most organized file structures and naming schemes. It seems that organizational skills needed for web authoring extended beyond the computer. Others were extremely creative in their graphics, but disorganized in their files. Student feedback ranged from eight who enjoyed the challenge of web authoring to five who did not see the point of needing to know how to do it when you can just ‘click, click, click in MySpace and tada it’s there.’

In email, there was a statistically significant increase in self-reported learning from before the class \([M=4.17, SD=1.23]\) to after the class \([M=4.83, SD=0.38, t(35)=-3.94, p<.0005]\). The eta squared statistic (.31) indicated a large effect size. Email was the smallest segment of the entire course curriculum. Students were expected to be able to compose a message, copy it to others, blind copy it to others, reply, forward, and create attachments. A pre-assessment of student skills showed that majority of the students could do all of the expectations except for blind copying. One student in the entire class had never used email. She enjoyed learning how to attach items to send to her parents.

In presentation software, there was a statistically significant increase in self-reported learning from before the class \([M=3.08, SD=1.42]\) to after the class \([M=4.36, SD=0.80, t(35)=-5.37, p<.0005]\). The eta squared statistic (.45) indicated a large effect size. At the start of class, almost all students knew how to create a presentation and add various media to their slides.
However, students gained a sense of restraint in this particular skill by limiting their use of animations, color, splashy backgrounds, and sound effects that detract from presentations. Though only two students said they learned the most in presentations, discussions in class revealed that many students liked what they learned *not to do*. The expectations for a refined and professional presentation, including attire when presenting, helped their writing skills.

In research on the Internet, there was a statistically significant increase in self-reported learning from before the class \[M=4.47, SD=0.77\] to after the class \[M=4.75, SD=0.44, t(35)=-2.53, p<.0005\]. The eta squared statistic (.15) indicated a large effect size. At the start of class, majority of the students said that they approached the Internet first when starting a research project. At the end of the course, it was the same. During the class, students were advised to use valid resources and were directed toward Encyclopaedia Britannica Online as a good starting point. During the course of the school year however, access to the online encyclopedia was no longer available to “community users” as defined by the university system. The students happened to be categorized as “community users” since they were not yet students of the higher education student population that paid dues for certain library electronic services. Therefore, students reverted to their old ways once the resources were no longer available to them. Also of note is that the school does not have a school library or a librarian on staff, but relies on the university library and resource available there.

In ethics and safety, there was a statistically significant increase in self-reported learning from before the class \[M=3.11, SD=1.39\] to after the class \[M=4.61, SD=0.65, t(35)=-7.05, p<.0005\], the third largest mean gain. The eta squared statistic (.73) indicated a large effect size. None of the students at the start of the course indicated that they ever had regular discussions about ethics and safety regarding the Internet. They laughed at how their “parents are all in a
bunch over MySpace. It's just for fun. Hawaiians don't do the running away stuff like the mainland does.” Unfortunately, this disconnected attitude to the dangers of the Internet chat rooms and instant messaging was the primary reason ethics and safety was discussed every week and sometimes twice a week. Throughout the semester, the students were expected to broaden their perspectives of parental concern and personal responsibility about information that is shared over the Internet. The result was a robust understanding of the positive aspects of and model behavior on the Internet as well as a healthy awareness of the bias, misinformation, and danger that can lurk there.

A mixed between-within subjects analysis of variance was conducted to ascertain differences in self-perception of learning between males and females in all areas. No significant differences were found in the seven software application and computer use areas, nor in the overall self-knowledge assessment.

**Research Question Two**

Research question two asked, “How do students consider formal computer literacy courses helpful and relevant to their future careers?” To answer this question, students were asked an open-ended question in the survey. All 37 students respondents indicated that they felt the formal computer literacy class was important to their future careers. Figure 1 lists statements from several students.

<table>
<thead>
<tr>
<th>Question: Do you think that Computer Literacy class is/was important to help you in your future careers?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student 1</strong>: yes because now days, people are using hightech stuff and in the future there are going to be even more of it</td>
</tr>
<tr>
<td><strong>Student 12</strong>: Yes, because now every business uses a computer and if you dont know how to use one then you'll not get a very good job and you won't be able to afford the things that you want</td>
</tr>
<tr>
<td><strong>Student 19</strong>: I think it was important for my future careers, because I started my resume, and learned a lot about word processing which is important for jobs</td>
</tr>
<tr>
<td><strong>Student 24</strong>: yes, i think computer literacy class is important in my future careers because computers are pretty much taking over the world. the technology is getting more and more advance every year, so if you can't beat them join them.</td>
</tr>
</tbody>
</table>
During class discussions, students thought about their parents and guardians and what kinds of computers skills they might need to employ on a daily basis for work. Many students began to realize that computers are a ubiquitous presence in modern society. After considering their own career aspirations and computer skills needs, one student even shared that he thought spreadsheets could help him because he “want(ed) to be a fabracator and welder and im not good at math.” The connections that students were able to make between specific skills and their chosen profession went beyond their initial assertions of computer mastery. It was during this discussion that students began to actively debate that a course like computer literacy was useful after all and that they still had things to learn beyond their cell phone game downloads and instant messaging.

In the survey, 100% of student respondents also indicated that they felt computer literacy was an important life skill. During discussion, some students pointed out that they were already more literate than most of their parents. “We can fix the scanner and printef’ and ‘we upload photos for them’ were in common agreement throughout the class. Students concluded that computer literacy was more than just an academic or a workforce need, it was a life skills need that pervaded their free time too.

**Research Question Three**

Research question number three asked, “How do students describe the impact of computers in their lives?” The major sub question was, “Where do students learn about computers and computer usage?” The survey question designed to probe this question prompted strong responses from majority of the students. Throughout the semester, students were asked to continuously add to a list of things that fit the definition of “computer.” Considering their list of items which included their desktop computers, laptop computers, mp3 players, cell phones, and
gaming systems, responses could be grouped into three major categories. The first category is communication. Students expressed concern over their ability to keep in touch with their friends if all they had to use was a telephone. The second category is information gathering. Students relied predominantly on the World Wide Web to gather data for school projects, facts for current events, particulars for gossip, and music for personal use. The third category revolved around the ability to word process. The word processing capabilities of computers was considered essential for reports and papers, whether mandated by their teachers or personally preferred. Rather than list a few responses, all student responses are shown in Figure 2 to demonstrate the passionate nature of their replies.

During classroom discussion, many students explained that their home use of the computer extended beyond that of school-related needs. Some watched television on their computer by connecting their cable systems to their desktops. Via this connection, they could record programs and watch it at their leisure. Others listen to their music from their computer systems, creating playlists for transfer to their personal portable players and saving the battery life on their personal players. And many used personal chat and instant messaging to communicate with their friends, where parents“can't listen in because all they are going to hear is click-click-click of us typing.” From their responses, it seemed like their home computers were a entertainment systems.

On the other hand, not all students used their computers as robustly as described previously. A handful of students said that computer use was limited by their parents to school work only. When prompted further, these students shared that their computers were not located in their bedrooms, but in a general location in their homes. Those students who had more free-range use of their computers had them in their bedrooms.
**Question:** Imagine that you no longer had computers. How would that impact your life? Your schoolwork?

**Student 1:** <Blank>

**Student 2:** Life would be hard. It would make my life boring. It would make schoolwork harder because you would have to go to a library to get your resources.

**Student 3:** <Blank>

**Student 4:** My life would be boring because I would have nothing to go on to chat with my friends. But it would make me go outdoors more and I would get more exercise. And it would be harder to do researches for school and to write reports.

**Student 5:** My life would suck because then there wouldn't be anymore TV, video games, and I would have to go to the library for all reports.

**Student 6:** OMG. I think I would die just joking. I think that that we would have to hand write all our project and essays.

**Student 7:** Everything would be really unorganized and all my reports would be junk.

**Student 8:** I would have to write everything out and I would have to go to the library a lot, and even then I still might not find the information I'm looking for.

**Student 9:** I would have a hard time because I would have to read books and go to the library and school ends at 3:30 and I catch bus to the windward side.

**Student 10:** Yes. then instead of typing out papers for classes, we'd have to write it and soon get cramps in our hands.

**Student 11:** If we did not have computers anymore then a lot of people in the world would not be able to live because some of the stuff that we have in this world all have to relate to the computer and if that wasn't there anymore then we wouldn't have all of those things.

**Student 12:** I would no longer be able to learn more about current events and I wouldn't be able to know what is going on in the music scene. I also wouldn't be able to communicate with a lot of my friends.

**Student 13:** A lot because I would not be able to look up information as fast as I use to. It would be harder to do projects and I would have to go to the library.

**Student 14:** It would impact my life greatly, because for me without a computer I wouldn't have any way of communicating with people besides the telephone. Me not having a computer to do my schoolwork would be very had for me to get used to because I need the computers to do papers and I don't want to have to write like a 25 page paper by hand. That would really suck!!

**Student 15:** Having no computers would have a big impact on my life, I Wouldn't be able to go on the internet and do research, also it affects my school work because some homework for school requires computer use at home. Like for english and other classes where you need to type out essays and papers.

**Student 16:** If there were no more computers, I think life would be very hard for school and my social life because I need the computer to type my papers and keep everything organized.

**Student 17:** It would impact my social life because I like to go on the Internet.

**Student 18:** I wouldn't be able to talk to my friends on the internet, met new people and I wouldn't be able to research on the internet.

**Student 19:** It would be hard because if you had o type out a huge essay you would need a computer to type faster.

**Student 20:** I think that not having computers would impact my life alot because I use the computer alto for research I would have to go to the library alot instead of looking up stuff in the internet.

**Student 21:** This impact my life greatly because computers are like my life. I hope that doesn't happen.

**Student 22:** If computers no longer existed, my schoolwork would be a lot harder, because I would have to write everything out by hand, and I would also have no calculators, so math would be a much harder subject.
Student 23: I would not be able to type up my projects, and I would not be able to play games and converse with friends on the internet.

Student 24: It would impact life because you wouldn't be able to to your work or research anything on the internet.

Student 25: I definitely would feel deprived. No way to type up papers or research anything easily and quickly...it wouldn't be a good thing.

Student 26: It would take me a lot more time and effort because we would have to hand write everything out and if we need to make more then one draft you would have to write it all over again.

Student 27: If we had no computers everything would be slower and less efficient. If you were a cashier you'd have to add up and count the customer's change which would take a lot longer. It would effect my schoolwork by having everything due later, you'd have to do everything the long way.

Student 28: I wouldn't be able to research more because I would only have the library and books to inform me. I wouldn't be able to keep in touch with friends and I wouldn't be able to type out anything.

Student 29: I wouldn't be able to do anything.

Student 30: The computer is my life. I spend most of my free time on it on aim and myspace. Without the computer it would be really hard and exhausting to have to go to the library and search and carry like fifteen books home.

Student 31: Having no computers would impact my life greatly because almost everything is computers now like cellphones and other equipment that we use daily. If we had to write a report for school, it would take longer because we would have to write it all out and it would be a pain for the teacher to read all of the ugly handwriting.

Student 32: I wouldn't be able to talk to people over the internet anymore, which would be bad. And if I couldn't just keep saved files of work then organization in school work would be harder.

Student 33: It wouldn't impact my life as much as my schoolwork.

Student 34: Without computers, life would be much more difficult. Computers help me to keep in contact with my friends, relatives, teachers, and family members. Computers make school work easier and faster (esp. researching). I like using the computer because it makes my school work look neater and more professional-looking. I also use computers for entertainment purposes. I like to listen to music on the computer and just learn new things everyday. Sometimes, I even am interested in the news through the internet on computers. Computers make learning so much more fun!

Student 35: Having no computers would impact my life greatly because almost everything is computers now like cellphones and other equipment that we use daily. If we had to write a report for school, it would take longer because we would have to write it all out and it would be a pain for the teacher to read all of the ugly handwriting.

Student 36: I wouldn't be able to talk to people over the internet anymore, which would be bad. And if I couldn't just keep saved files of work then organization in school work would be harder.

Student 37: What?

Figure 2. Examples of comments from student survey...continued
Supporting the idea of home computer use as an entertainment system, 30% of students (N=37) indicated on the survey that they learned about using the computer mostly at home while another 22% said mostly on their own. After the class, students reported a shifted to learning at schools, with 65% of the students indicating they learned about using the computer mostly at school.

**Summary and Discussion**

Student understanding of specific software applications, Internet research skills, and considerations of ethics and safety all increased significantly due to a computer literacy course intervention. All students in this study considered the course helpful and useful to their professional growth as digitally literate adults, although they also asserted that they deserved
recognition for computer and electronic skills that they already possessed. These students were all raised in society where computer multimedia plays a prominent role. Therefore, their self-learned skills, predominantly social in nature, are not to be taken lightly.

Internet research was the lowest gaining self-reported area. Though students were given standardized formats for bibliographies and references, directed towards valid and credible sources, and given techniques in determining bias on the Internet, they still reverted to their standard keyword searching on the World Wide Web. Of note is that the school in this study does not have a school library or an on-staff librarian. Instead, the school relies on the university library and resources available there. Therefore, students do not experience formal information literacy curriculum from a librarian that oftentimes supports and enhances a computer literacy curriculum.

In formal computer literacy curricula, equal weight is given to all productivity software applications. Results from this study, however, illustrate that students demonstrated the least gain in email applications. Perhaps the process of email does not need to be covered as thoroughly, directing more time towards email etiquette and safety instead. Students were quick to point out that they helped their parents and teachers with email and attachments and felt odd when it was a topic of learning in a course. However, results from this study, though all statistically significant, are largely self-reported. Though quiz scores were analyzed, they were not developed as criterion-referenced test items, and as such, cannot be empirically compared. Future developments of assessments schemes for this course should be better designed so that those comparisons can be made.

Before the class, many students already considered themselves highly computer literate since they interacted frequently with video game consoles, MP3 players, cell phones, and chat
rooms. Students used these aspects of computers and technology frequently. Yet, students had difficulty in completing specific computer-related tasks such as formatting a word processing document, establishing formulas in spreadsheets, and properly distinguishing terms such as upload and download. Results indicated that students were not computer literate in terms of workforce-oriented computer tasks, yet were comfortable and well versed in the social aspect. Therefore, the assertion that American students are not digitally literate and need a formal computer literacy course or courses is a rather accurate assessment.

However, a clearer definition of digital literacy perhaps needs to be developed. Students were adamant during the discussion that they be recognized as digitally literate. Teachers and parents, they asserted, had a different perception of mastery which included word processing and spreadsheets. The students questioned when they would have ever needed to use or learn those particular skills. One student even said, “Isn’t that your job to help us rather than saying we don’t know? Aren’t we the ones who fix the projectors for almost every teacher who tries to use it? I taught my mom how to email. Doesn’t that count for something?” Students know their computers and electronics as evidenced clearly and unmistakably in their “no computers” responses. In contrast, some students did recognize that they had yet to learn the specific skills needed later in life and appreciate the exposure to those skills.

The recognition by high school students that a course like computer literacy is necessary is a large leap in thought and of great interest. There are countless anecdotal observations of kids being more computer savvy than their parents, teachers, and other older adults. However, all students in this study recognized, some grudgingly, that they lacked specific skills that were needed in their future careers and appreciated that chance to learn, practice, and improve upon skills attached to future professions. Great credence was given to the fact that chatting, music
downloading, and gaming were accomplished easily by students. But, students learned and recognized that the social, free-time mastery would not earn them coveted jobs later. Overall, students broadened their definition of computer and technology skills as a life skill and expectations of productivity using computers and other technology.

References


