



Center for Research in Educational Policy

The University of Memphis  
325 Browning Hall  
Memphis, Tennessee 38152  
Toll Free 1-866-670-6147

## **McNairy County Laptop Program**

### **2007-2008 Evaluation Report**

Prepared for McNairy County Schools



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# July 2008

Clif Mims  
Deborah L. Lowther  
J. Daniel Strahl  
Louis A. Franceschini  
Todd A. Zoblotsky

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## **EXECUTIVE SUMMARY**

### **Introduction**

This report summarizes the 2007-2008 evaluation results of the McNairy County Schools Laptop (MCSL) program. The major goal of the MCSL program is to improve student learning and achievement in McNairy County schools through the integration of 21<sup>st</sup> Century technology tools with teaching and learning in K-12 classrooms. A key component of MCSL program was a rigorous and comprehensive evaluation study designed to gauge the impacts of the program relative to its primary goals.

### **Goals**

The MCSL Program goals are listed below. The evaluation was structured to assess the degree to which each program goal was achieved.

GOAL 1 Determine differences that emerge in teaching strategies used during computer-supported lessons versus conventional lessons represented by national norms.

GOAL 2 Determine to what degree does the laptop program support higher-order teaching and learning (e.g., problem solving, critical thinking, inquiry).

GOAL 3 Determine to what degree does the laptop program increase students' confidence and perceptions regarding skills in using technology to further their education and preparation for contemporary careers.

GOAL 4 Determine how students perceive the use and access of laptop computers.

GOAL 5 Determine what teachers perceive as the benefits and problems of integrating technology in laptop classrooms.

### **Participants**

McNairy County Schools has 7 elementary and junior high schools and 2 senior high schools. According the 2007 Tennessee Report Card, MCS had a student enrollment of 4,247 served by 305 teachers. MCS identified 7 teachers from 4 of the elementary schools and 1 of the middle schools as participants in this evaluation. Collectively these 5 schools reported an enrollment of 2,101 with 458 of these students enrolled in classes taught by the 7 laptop teachers.

### **Design**

This study used a global descriptive design that employed a mixed-methods approach (Johnson & Onwuegbuzie, 2004) that utilized a number of validated data collection instruments.

## Measures

### Direct Classroom Observation Measures

School Observation Measure(SOM<sup>®</sup>): Measures usage of 24 instructional strategies.

Observation of Computer Use (OCU<sup>®</sup>): Measures student use of computers.

### MCSL Program Evaluation Surveys

- MCSL Student Technology Questionnaire (MCSL-STQ<sup>®</sup>): Collects student impressions regarding impact of laptop use on learning, enjoyment of using laptops, subject areas of laptop work, and most commonly used software.
- MCSL -Teacher Technology Questionnaire (TTQ<sup>®</sup>): Collects teacher agreement regarding: impact of laptop use on students and instruction, teacher readiness to integrate student use of laptops, and support for the laptop program.
- MCSL – Technology Skills Assessment (MCSL-TSA<sup>®</sup>): Collects data on the perceived technological abilities of teacher, parent and administrator support and participation and overall impact of program on students.

## Procedures

Targeted (prearranged 45-60 minute session) observations were conducted from Fall 2007 to Summer 2008. The surveys were also administered to teachers and students during Spring 2008.

## Results

### Direct Classroom Observation Results

*Targeted Observations.* Because of the very small sample size ( $n = 5$ ) and a concomitant lack of statistical “power,” the series of dependent  $t$ -tests suggested no statistically significant differences between pretest and posttest SOM observations at the McNairy schools. Noteworthy, however, were several robust effect sizes that signified important changes in the instructional direction of the initiative over time. Practices such as direct instruction ( $d = 1.12$ ), independent inquiry ( $d = 0.74$ ), project-based learning ( $d = 0.78$ ), and performance assessment ( $d = 0.57$ ) increased substantially between Fall 2007 and Summer 2008. Conversely, practices addressed by the SOM that appeared to have *decreased* substantially from fall 2007 to summer 2008 include ability groups ( $d = -0.57$ ), work centers ( $d = -0.57$ ), teacher acting as coach/facilitator ( $d = -1.09$ ), independent seatwork (pretest  $M = 0.30$ ; posttest  $M = 0.03$ ), and technology as a learning/tool or resource ( $d = -0.82$ ).

Although the small sample size inhibited finding statistical significance when contrasting the posttest SOM mean scores with those obtained for the comparative norm sample, at least one highly significance difference was observed between MCSL and the norm groups in independent seatwork, along with three other marginal differences in the teacher acting as a

coach/facilitator, independent inquiry/research on the part of students, and technology as a learning/tool or resource.

*Observations of Computer Use.* Posttest observations on the OCU that were obtained in the five McNairy schools are contrasted with corresponding “test values” recently obtained from a comparative norm sample of 170 schools. To determine whether statistically significant differences separated the posttest values obtained for the McNairy schools and the comparative norm sample’s “test values,” a series of one-sample *t*-tests were conducted and standardized effect sizes subsequently computed for all of the *OCU* items.

The small sample size and correlative lack of statistical power inhibited finding differences between the MCSL and norm groups on the *OCU*. Small differences were noted in the decreased use of “word processing” and “presentation” software along with increased uses of “concept mapping” and “other application” software in the Application Software category. Among Internet/Research tools, “Interactive Learning”, “Asynchronous Communication”, and “Other” usages appears similarly to have *increased*, as has the use of “Other” Testing software. Among items concerned with Overall Meaningful Use, there was sharp decline in the observed frequency of computer use having “low meaning”, almost to the point of statistical significance.

The MCSL observations differed significantly from the comparative norm group in the frequency with which “Internet Browsers” were used for an “Information Search” at McNairy schools ( $d = 1.37$ ). Conversely, the frequency with which “low level” uses of the computers were observed for McNairy schools was significantly *lower* than that observed for the comparative norm sample ( $p < .001$ ,  $d = -1.97$ ).

## **Survey Results**

*Teacher Survey.* The MCSL-TTQ was completed by total of 5 MCSL teachers from 5 schools. When comparing the MCSL results with the comparison norms, MCSL teacher responses were significantly more positive on all TTQ categories: Impact on Classroom Instruction; Impact on Students; Teacher Readiness to Integrate Technology; and Technical Support. Strikingly, the MCSL teachers showed significantly greater confidence that they routinely integrate meaningful laptop use into lessons. However, overall support for technology in the school was ranked as the lowest category mean among the five, with only 60% of the teachers agreeing that their school had a well-developed technology plan and that other teachers were generally supportive of the laptop program.

*Student Technology Questionnaire.* Overall, responses from 369 MCSL students were very positive with regard to using laptops at school. There were highly significant differences (at  $p < .001$ ) between the means computed for McNairy County students and the ones computed for the 4081 students in the comparative norm sample were observed for 13 of the 16 “personal impact” items in the first section of the *STQ*. Interestingly, however, means

obtained on two *STQ* items concerned with students' self-assessed improvement in schoolwork—specifically, “My writing has improved because I use a laptop” ( $M = 1.97$ ,  $SD = 0.83$ ,  $d = -0.01$ ) and “Using laptops will make me a better student” ( $M = 2.37$ ,  $SD = 0.70$ ,  $d = 0.04$ )—evidenced no differences with test values obtained for the comparative norm sample.

In the second section of the survey, there was no difference was observed between the norm value and McNairy student reports of how frequently they used computers “by themselves” ( $d = -0.09$ ), McNairy students indicated that they more often used laptops both “with one other student” ( $d = 0.59$ ) and “in groups of three or more students” ( $d = 0.53$ ). McNairy students reported using the laptop significantly less often than the comparative norm sample in the subject matter areas of mathematics ( $d = -0.19$ ), science ( $d = -0.44$ ), social studies ( $d = -0.37$ ) and especially language arts ( $d = -1.12$ ).

In terms of specific software applications cited in the third section of the *STQ*, the frequency with which McNairy students reported using “spreadsheets” ( $d = -0.04$ ) and “Internet Browsers” ( $d = -0.01$ ) did not appear to differ significantly from those reported by students in the comparative norm sample; and only marginal differences favoring the comparative norm sample were observed with respect to the frequency with which McNairy students reportedly engaged in computer “Gaming” ( $d = -0.11$ ) or employed “Authoring” software ( $d = -0.12$ ). Regarding four other major software applications, however, differences in the reported frequencies with which McNairy students and those in the comparative norm sample used “Word Processing,” “CD Reference,” “Presentation,” or “Educational” software appeared to be not only statistically significant but tended to run in opposing directions.

*Technology Skills Assessment.* A total of 7 teachers completed the Technology Skills Assessment, and teachers were positive about their skills in using computers. Respondents agreed 100% with all items related to basic computer skills and basic software skills. Survey participants were more diverse in their responses to the basic Internet skills. While the vast majority of respondents identified themselves as skilled with basic multimedia skills, a little less than half of the respondents were able to digitally record. Only one quarter of respondents were comfortable importing digital video. Respondents were diverse in their responses to questions about advanced computer skills and the use of technology for learning. These results indicate all teachers in the program are comfortable with computers and fluent with lower level skills for computer use, but possess a more diverse set of abilities related to more complex technology skills.

## **Conclusions**

The conclusions of the present study are presented in association with each of the MCSL program goals in the following section.

### **GOAL 1**

***What differences emerged in teaching strategies used during computer-supported lessons versus conventional lessons represented by the national norms?***

The results reveal that MCSL students had greater advantages than comparative norm group students to develop 21<sup>st</sup> Century knowledge and skills and equal to or enhanced advantages for increased learning and achievement. Although the significance of these results were inhibited by the small sample size, observations showed that MCSL students engaged in meaningful computer activities that required the use of 21<sup>st</sup> Century skills more than comparison students. Teachers more often supported student learning with coaching and facilitation and evaluated student learning through the use of performance assessments. Similarly, MCSL vs. comparison teachers had higher agreement that use of technology had a positive impact on student learning and achievement. MCSL teachers were adequately prepared to implement technology integration lessons that were significantly more student-centered, used technology as a learning tool, and were more meaningful than comparison teachers.

## **GOAL 2**

***To what degree does the laptop program support higher-order teaching and learning (e.g., problem solving, critical thinking, inquiry)?***

It is clearly evident that the McNairy County Schools Laptop program has reduced the gap in educational opportunities by providing approximately 150 laptop computers to students in 5 McNairy County schools. The positive impact of this initiative is reflected in data from over 373 MCSL students who reported that using laptop computers increased their research skills, made schoolwork easier, made them learn more, and helped them do better on tests. The MCSL initiative also had a positive impact on teachers in the program, who, as compared to the norms, reported a significantly greater readiness to integrate technology into their teaching and greater belief that effective use of technology can enhance teaching and learning. Additional evidence of greater educational opportunity was revealed when examining data from random visits to 5 MCSL classrooms. For example, computer activities in MCSL lessons were significantly more meaningful and MCSL students more frequently used the laptops as learning tools. Collectively, these data present triangulated evidence that the 2007-2008 MCSL program implementation did support higher order teaching and learning through ubiquitous access to technology.

## **GOAL 3**

***To what degree does the laptop program increase students' confidence and perceptions regarding skills in using technology to further their education and preparation for contemporary careers?***

It is evident MCSL students have increased confidence regarding their ability to use and benefit from laptop computer usage. Students reported laptops made them better researchers, improved their ability to get a job in the future, and made them better computer users, all critical elements to finding and keeping a job in an increasingly technological society. MCSL students demonstrated abilities to work collaboratively and in small groups well with technology, with a high preference for using presentation applications for sharing

information with their teachers and peers. Teachers reported with high agreement that students were technologically capable, and that the use of computers has increased the amount and quality of interactions between students, as well as the quality of the work from students.

#### **GOAL 4**

##### ***How do students perceive the use and access of laptop computers?***

Collectively, the evaluation evidence suggests that the MCSL program enabled and supported participating students to perceive the use and access to laptop computers positively. The most obvious change was the introduction of one-to-one wireless learning environments in 5 schools. Yet, more important were the changed instructional practices that engaged students in more hands-on, research-based activities that required use of the Internet and research software more often than typical classrooms represented by the comparison norms, and the decrease in the low level use of laptop computers with students. Innovative applications of laptop use were implemented with MCSL students who reported significantly higher agreement than comparison students that they were able to use technology in meaningful ways and believed laptop technology benefited their learning in a variety of ways.

#### **GOAL 5**

##### ***What do teachers perceive as the benefits and problems of integrating technology in laptop classrooms?***

Teachers reported with high agreement that students in the MCSL Program were technologically capable, and that the use of computers has increased the amount and quality of interactions between students. Teachers also reported that quality of student work was improved by access to laptops, and the integration of laptops has positively impacted student learning and achievement. Teachers also reported their lessons are more student centered and interactive with the use of laptops. Comparatively, teachers report that there is room for improvement when it comes to other teachers supporting the laptop program at their school, and the need for additional improvement in the development of plans for the use of laptop technology and professional development activities to derive the greatest benefits of this technological resource for their students.

#### **Summary**

In a one-year period, MCSL made great strides toward achieving the overall program goal of improving student learning and achievement through the integration of 21<sup>st</sup> Century technology tools into instruction. First, the MCSL program successfully infused approximately 150 laptop computers into McNairy County Schools' junior high schools to create one-to-one learning environments. Second, MCSL teachers were adequately prepared to implement technology integration lessons that were significantly more student-



centered, used technology as a learning tool, and were more meaningful than comparison teachers. Third, MCSL vs. comparison teachers had greater technological confidence and belief in the learning benefits of effective integration practices. And, finally, MCSL students self-reported high frequencies of using 21<sup>st</sup> Century skills for Internet, word processing, and presentation activities in their classroom settings. Thus, with continued engagement in one-to-one learning, MCSL students have a greater potential to be better prepared for future careers.

It is evident that the McNairy County Schools Laptop program has been a catalyst for innovative technology applications that have yielded improved educational opportunities for McNairy County's students. It is also evident that small-scale implementation of this program has inhibited interpretation of most of these results as being statistically significant and therefore may not necessarily be generalized to a larger population at MCS.

# **MCNAIRY COUNTY LAPTOP PROGRAM**

## **2007-2008 EVALUATION REPORT**

This report summarizes the 2007-2008 evaluation results of the McNairy County Schools laptop (MCSL) program. The purpose of the evaluation was to provide data to (a) participating schools and teachers to help them improve practices, and (b) district leaders and other stakeholders to assess the degree to which program goals have been attained.

### **EVALUATION QUESTIONS**

This evaluation was designed to assess processes and outcomes from the McNairy County Schools' technology integration initiative. The key evaluation questions are listed below.

1. What differences emerged in teaching strategies used during computer-supported lessons versus conventional lessons represented by the national norms?
2. To what degree does the laptop program support higher-order teaching and learning (e.g., problem solving, critical thinking, inquiry)?
3. To what degree does the laptop program increase students' confidence and perceptions regarding skills in using technology to further their education and preparation for contemporary careers?
4. How do students perceive the use and access of laptop computers?
5. What do teachers perceive as the benefits and problems of integrating technology in laptop classrooms?

### **PARTICIPANTS**

McNairy County Schools has 7 elementary and junior high schools and 2 senior high schools. According the 2007 Tennessee Report Card, MCS had a student enrollment of 4,247 served by 305 teachers. MCS identified 7 teachers from 4 of the elementary schools and 1 of the middle schools as participants in this evaluation. Collectively these 5 schools reported an enrollment of 2,101 with 458 of these students enrolled in classes taught by the 7 laptop teachers.

### **DESIGN**

A global descriptive design was used for the evaluation. This design employed a mixed-methods approach (Johnson & Onwuegbuzie, 2004) to examine the processes and outcomes that resulted from this initiative. Validated survey and observation instruments served as the critical data sources in the evaluation model. Details of the instrumentation and administration procedures are listed below.

## MEASURES AND PROCEDURES

Two measurement strategies were used to collect the evaluation data: direct classroom observations and surveys. Following are descriptions of the evaluation instruments.

### **Direct Classroom Observation Measures**

Independent external researchers completed extensive training to conduct targeted classroom observations of the laptop classrooms. The training prepared them to collect frequency data regarding observed instructional practices with two data collection instruments: the School Observation Measure (SOM<sup>®</sup>) and the Observation of Computer Use (OCU<sup>®</sup>). The SOM was used to collect data regarding overall classroom activities and the OCU was used to assess student use of computers. The SOM and OCU are described below.

**SOM.** The SOM was developed to determine the extent to which different common and alternative teaching practices are used throughout an entire school (Ross, Smith, & Alberg, 1999). *Targeted* observations were conducted to examine classroom instruction during prearranged 45- to 60-minute sessions in which MCSL teachers implemented a prepared lesson that integrated the use of laptops. Notes forms were completed every 15 minutes of the lesson and were then summarized on a SOM Data Summary Form.

The observer examined classroom events and activities descriptively, not judgmentally. Notes were taken relative to the use or nonuse of 24 target strategies. The notes form also contained two global items that use a three-point scale (low, moderate, high) to rate, respectively, the use of academically focused instructional time and degree of student attention and interest. At the conclusion of the visit, the observer summarized the frequency with which each of the 24 strategies was observed across all classes in general on a data summary form. The frequency was recorded via a 5-point rubric that ranges from (0) Not observed to (4) Extensively. The same 5-point scale was used to summarize how frequently *high* academically focused class time and *high* student interest/attention were observed.

To ensure the reliability of data, observers received a manual providing operational definitions of terms, examples and explanations of the target strategies, and a description of procedures for completing the instrument. The target strategies include traditional practices (e.g., direct instruction and independent seatwork) and alternative, predominately student-centered methods associated with educational reforms (e.g., cooperative learning, project-based learning, inquiry, discussion, using technology as a learning tool). The strategies were identified through surveys and discussions involving policy makers, researchers, administrators, and teachers, as those most useful in providing indicators of schools' instructional philosophies and implementations of commonly used reform designs (Ross, Smith, Alberg, & Lowther, 2001).

After receiving the manual and instruction in a group session, each observer participated in sufficient classroom-based practice exercises to ensure that his/her data were comparable with those of experienced observers. In a 2004 reliability study reported by

Sterbinsky, Ross and Burk, observer ratings were within one category for 96% of the multi-class observations and for 91% of the targeted observations.

**OCU.** A companion instrument to SOM is the Observation of Computer Use (OCU) (Lowther & Ross, 2001). The OCU was completed as part of the SOM observation sessions, during which OCU data were also recorded in 15-minute intervals and then summarized on an overall data form.

The OCU was designed to capture exclusively *student* access to, ability with, and use of computers rather than teacher use of technology by recording four types of data: (a) computer capacity and currency, (b) configuration, (c) student computer ability and (d) student activities while using computers. Computer capacity and currency is defined as the age and type of computers available for student use and whether or not Internet access was available. Configuration refers to the number of students working at each computer (e.g., alone, in pairs, in small groups). Student computer ability was assessed by recording the number of students who were computer literate (i.e., easily used software features/menus) and the number of students who easily used the keyboard.

The next section of the OCU focuses on student use of computers with regard to: the types of activities, the subject areas of activities, and the software being used. The computer activities are divided into four categories based on the type of software tool: production tools, Internet/research tools, educational software, and testing software. Within each category, primary types of software are identified. For example, under Production Tools, the software includes: word processing, databases, spreadsheets, draw/paint/graphics, presentation (e.g., PowerPoint®), authoring (e.g., KidPix®), concept mapping (e.g., Inspiration), and planning (MS Project®). For the Internet/Research Tools, three types of software are included: Internet browser, CD reference materials, and communications (e.g., email, listservs, and chat rooms). The Educational Software also has three types of software: drill/practice/tutorial, problem-solving (e.g., Riverdeep™) and process tools (e.g., Author's Toolkit™). Testing Software has individualized/tracked (Accelerated Reader™) and generic types. With this type of recording system, several activities can be noted during the observation of one student working on a computer. For example, if a student gathered data from the Internet, created a graph from the data, and then imported the graph into a PowerPoint presentation, the observer would record three types of software tools as being observed: Internet browser, spreadsheet, and presentation.

This section of the OCU ends by identifying the subject area of each computer activity. The categories include: language arts, mathematics, science, social studies, other, and none. The computer activities and software being used are summarized and recorded using a five-point rubric that ranges from (0) Not Observed to (4) Extensively observed. The final section of the OCU is an "Overall Rubric" designed to assess the degree to which the activity reflects "meaningful use" of computers *as a tool* to enhance learning. The rubric has four levels: 1 – Low-level use of computers, 2 – Somewhat meaningful, 3 – Meaningful, and 4 - Very meaningful. Reliability data for the OCU (Sterbinsky & Burke, 2004) show that observer ratings were within one category for 97% of the multi-class observations and for 91% of the targeted observations.

## Surveys

Program evaluation surveys were administered to two groups: students and teachers. All surveys were administered in an on-line format that was delivered via CREP's Survey Management System (SMS). Brief descriptions of each survey are below.

**TTQ**<sup>®</sup>. The Teacher Technology Questionnaire (TTQ) is a two-part instrument used to collect teacher perceptions of computers and technology (Lowther, Ross, & Allberg, 2001). In the first section, teachers rated their level of agreement with 20 statements regarding five technology-related areas: impact of laptop use on classroom instruction, impact of laptop use on students, teacher readiness to integrate student use of laptops, overall support for the laptop program in the school, and technical support for the laptop program. Items were rated with a five-point Likert-type scale that ranged from (1) Strongly Disagree to (5) Strongly Agree.

Two primary questions were asked in the second section. The first asks teachers to rate their level of computer ability as very good, good, moderate, poor, or no ability. Next, teachers indicate if they have a home computer, and if they do, if they use the home computer to access instructional materials on the Internet and/or to prepare classroom materials.

**STQ**. The Student Technology Questionnaire presented students with 16 statements regarding classroom use of laptops. Students were asked to use a three-level scale (Yes, Some, No) to rate their level of agreement with each statement. The statements elicited student impressions regarding the laptops improving student learning and achievement, enjoyment of using the laptops, and desire for continued use next year. Students were then asked to indicate the degree to which they completed laptop activities alone or with other students, the typical subject areas of laptop work, and which software they most commonly used.

**TSA**. The Technology Skills Assessment is a 57-item survey that includes 50 three-point Likert-type questions designed to assess the perceived technological abilities of the participants (Marvin, Lowther, & Ross, 2002). All of the questions are arranged into seven categories, which are aligned to the International Society for Technology in Education's (ISTE's) National Educational Technology Standards (NETS) for Teachers and Students Grades 3-5. The categories of the survey are as follows: Computer Basics, Software Basics, Multimedia Basics, Internet Basics, Advanced Skills, Using Technology for Learning, and Policy and Ethics.

## DATA COLLECTION

A data collection summary for the McNairy County Laptop Program evaluation is presented in Table 1. A total of 19 hours of direct classroom observations were conducted in 7 classrooms. Collectively, participants completed 380 evaluation surveys via CREP's online Survey Management System.

### TABLE1. Data Collection Summary

Type	Instrument	Number Collected	Number of Schools	Procedure
Classroom Observations	SOM	20	5	Target observations were pre-arranged forty-five minute to one-hour sessions in which laptop teachers demonstrated a prepared lesson using MCSL laptops. Note forms were completed every 15 minutes of the lesson.
	OCU	20	5	
Teacher Surveys	TTQ	5	5	Administered on line and made available to all laptop program teachers.
Student Survey	STQ	373	5	Administered on line and made available to all students in laptop classes.
Technology Skills Assessment	TSA	7	5	Administered on line and made available to all laptop teachers.

## RESULTS

The results of the study are presented below by measurement strategy. In the Conclusion section, findings are synthesized across instruments to address the research questions. Regardless of design employed, Effect Sizes (*ES*) were computed using Cohen's *d* formula (Cohen, 1988) to determine the educational importance of differences. An *ES* indicates the number of standard deviations by which the "treatment" group surpasses the "comparison" group. According to Cohen, an *ES* having an absolute value greater than 0.25 is considered educationally important.

### Direct Classroom Observation Results

Targeted observations were conducted in the 7 laptop classrooms. The comparison group for this analysis is comprised of responses from schools that served as control sites during a separate technology integration project evaluation from 2003 – 2006. Therefore, interpretations based on the comparisons should be made cautiously because of differences in the school years involved and locale, and due to lack of explicit matching between MCS and comparison teachers. The data were collected with SOMs and OCUs during prearranged forty-five minute to one-hour sessions in which laptop and comparison group teachers were asked to implement a prepared lesson using the MCSL laptops.

### School Observation Measure (SOM)

Data from targeted visits to MCS laptop classrooms revealed that the teachers primarily implemented student-centered activities during the observations (see Table 2). Specifically, the following activities were observed frequently or extensively during the indicated percentages of visits: direct instruction (42.9%), cooperative/collaborative learning (28.6%), use of higher level questioning (57.2%), teacher acting as coach/facilitator (57.1%), technology as a learning tool or resource (85.7%), high level of student attention/interest/engagement (71.5%), and high academically focused class time (71.4%). Of key interest to this study, the students were frequently to extensively using their laptops as a tool to support and enhance their learning activities during nearly all (85.7%) of the visits. Additional student-centered activities included independent research (71.5%). Teachers and students were also frequently to extensively observed using the laptops for instructional delivery purposes in 14.3% of the classrooms. Use of more traditional instructional practices was seen during approximately 40% of the visits. Specifically,

teachers provided direct instruction in 42.9% of the observations. Interestingly, students also had a high percentage of activities focusing on independent inquiry and research (71.5%). The majority of the targeted classrooms frequently to extensively had a high academic focus (71.4%) and high student engagement and interest (71.5%). Conversely, the following strategies were not observed or rarely observed: Team teaching (100%), individual tutoring (100%) multi-age grouping (100%), ability grouping (100%), work centers (100%), integration of subject areas (100%), and parent/community involvement in learning activities (100%), independent seatwork (100%), systematic individual instruction (100%), sustained reading (100%) and student discussion (100%).

**TABLE 2. School Observation Measure (Targeted) Big Picture**

Items with the MOST prevalence (% Frequently + Extensively) in Spring 2008:

Instructional Orientation	
Direct instruction (lecture)	42.9
Cooperative/collaborative learning	28.6
Instructional Strategies	
Use of higher-level questioning strategies	57.2
Teacher acting as a coach/facilitator	57.1
Student Activities	
Independent inquiry/research on the part of students	71.5
Sustained writing/composition (self-selected or teacher-generated topics)	14.3
Technology Use	
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	85.7
Computer for instructional delivery (e.g., CAI, drill & practice)	14.3
Summary Items	
High level of student attention/interest/engagement	71.5
High academically focused class time	71.4

Items with the LEAST prevalence (% Not Observed + Rarely) in Spring 2008:

<b>Instructional Orientation</b>	
Team teaching	100.0
Individual tutoring (teacher, peer, aide, adult volunteer)	100.0

<b>Classroom Organization</b>	
Ability groups	100.0
Multi-age grouping	100.0
Work centers (for individuals or groups)	100.0

<b>Instructional Strategies</b>	
Integration of subject areas (interdisciplinary/thematic units)	100.0
Parent/community involvement in learning activities	100.0

<b>Student Activities</b>	
Independent seatwork (self-paced worksheets, individual assignments)	100.0
Systematic individual instruction (differential assignments geared to individual needs)	100.0
Sustained reading	100.0
Student discussion	100.0

<b>Assessment</b>	
Performance assessment strategies	100.0
Student self-assessment (portfolios, individual record books)	100.0

**Items with the biggest changes (% Frequently + Extensively)**

<b>Items</b>	<b>Winter 2008</b>	<b>Spring 2008</b>
Use of higher-level questioning strategies	14.3	57.2
Independent inquiry/research on the part of students	28.6	71.5
Teacher acting as a coach/facilitator	85.7	57.1
High level of student attention/interest/engagement	100.0	71.5
Computer for instructional delivery (e.g., CAI, drill & practice)	28.6	14.3
Experiential, hands-on learning	14.3	0.0
Project-based learning	28.6	14.3



**TABLE 3. SOM<sup>®</sup> Data Summary**

Number of Respondents for Survey Period 1      Fall 2007      N = 6  
 Number of Respondents for Survey Period 2      Winter 2008      N = 7  
 Number of Respondents for Survey Period 3      Spring 2008      N = 7

School Observation Measure (Targeted) Items	% Not observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>Instructional Orientation</b>															
Direct instruction (lecture)	50.0	0.0	14.3	16.7	0.0	14.3	16.7	57.1	28.6	16.7	28.6	28.6	0.0	14.3	14.3
Team teaching	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooperative/collaborative learning	50.0	42.9	57.1	0.0	14.3	0.0	16.7	0.0	14.3	16.7	14.3	28.6	16.7	28.6	0.0
Individual tutoring (teacher, peer, aide, adult volunteer)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Classroom Organization</b>															
Ability groups	83.3	100.0	100.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Multi-age grouping	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Work centers (for individuals or groups)	83.3	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0
<b>Instructional Strategies</b>															
Higher-level instructional feedback (written or verbal) to enhance student learning	50.0	28.6	57.1	16.7	0.0	0.0	0.0	57.1	28.6	33.3	14.3	14.3	0.0	0.0	0.0
Integration of subject areas (interdisciplinary/thematic units)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project-based learning	83.3	71.4	71.4	16.7	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	28.6	14.3
Use of higher-level questioning strategies	33.3	28.6	28.6	0.0	14.3	14.3	33.3	42.9	0.0	33.3	14.3	42.9	0.0	0.0	14.3
Teacher acting as a coach/facilitator	0.0	0.0	14.3	0.0	0.0	0.0	16.7	14.3	28.6	33.3	57.1	57.1	50.0	28.6	0.0
Parent/community involvement in learning activities	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<b>Student Activities</b>																
Independent seatwork (self-paced worksheets, individual assignments)	83.3	100.0	85.7	0.0	0.0	14.3	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0
Experiential, hands-on learning	83.3	71.4	85.7	0.0	0.0	0.0	16.7	14.3	14.3	0.0	14.3	0.0	0.0	0.0	0.0	0.0
Systematic individual instruction	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustained writing/composition (self-selected or teacher-generated topics)	83.3	85.7	85.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	16.7	14.3	0.0	0.0
Sustained reading	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Independent inquiry/research on the part of students	33.3	57.1	28.6	0.0	0.0	0.0	66.7	14.3	0.0	0.0	14.3	28.6	0.0	14.3	42.9	0.0
Student discussion	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Technology Use</b>																
Computer for instructional delivery (e.g., CAI, drill & practice)	50.0	14.3	71.4	0.0	0.0	0.0	33.3	57.1	14.3	16.7	14.3	14.3	0.0	14.3	0.0	0.0
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	0.0	28.6	14.3	0.0	0.0	0.0	0.0	0.0	0.0	33.3	14.3	14.3	66.7	57.1	71.4	0.0
<b>Assessment</b>																
Performance assessment strategies	100.0	85.7	85.7	0.0	0.0	14.3	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Student self-assessment (portfolios, individual record books)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Summary Items</b>																
High academically focused class time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	28.6	16.7	0.0	0.0	83.3	85.7	71.4	0.0
High level of student attention/interest/engagement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	33.3	14.3	28.6	66.7	85.7	42.9	0.0

## **SOM Inferential Results: MCS Laptop Teachers vs. Comparison Norms**

Presented in Tables 4 and 5 are the means and standard deviations derived from the targeted administration of the *School Observation Measure (SOM)* during the fall of 2007 and again in the winter and spring of 2008 at five McNairy County schools. In Table 4, the fall *SOM* means are treated as “pretest” scores and are contrasted with a composite of winter and spring *SOM* means treated as “posttest” scores. To determine whether statistically significant differences were observed between pretest and posttest *SOM* means, a series of dependent or correlated *t*-tests were run on all *SOM* items and standardized effect sizes were subsequently computed.

In Table 5, the posttest *SOM* means and standard deviations obtained in the McNairy schools are reprinted and subsequently contrasted with corresponding *SOM* statistics based on a comparative norm sample of 182 schools. To determine whether statistically significant differences separated the posttest means obtained for the McNairy schools and “test values” derived from the comparative norm sample, a series of one sample *t*-tests were conducted and standardized effect sizes computed for all of the *SOM* items.

### ***Pretest-Posttest Differences on the School Observation Measure (SOM)***

Because of the very small sample size ( $n = 5$ ) and a concomitant lack of statistical “power,” the series of dependent *t*-tests suggested no statistically significant differences between pretest and posttest *SOM* observations at the McNairy schools. Noteworthy, however, were several robust effect sizes that signified important changes in the instructional direction of the initiative over time. Practices addressed by the *SOM* that appeared to have *increased* substantially from fall 2007 to summer 2008 included:

- Direct Instruction (pretest  $M = 1.1$ ; posttest  $M = 2.57$ ;  $d = 1.12$ )
- Independent Inquiry/Research (pretest  $M = 1.40$ ; posttest  $M = 2.10$ ;  $d = 0.74$ )
- Project-Based Learning (pretest  $M = 0.10$ ; posttest  $M = 0.73$ ;  $d = 0.78$ )
- Performance Assessment (pretest  $M = 0.00$ ; posttest  $M = 0.30$ ;  $d = 0.57$ )

Conversely, practices addressed by the *SOM* that appeared to have *decreased* substantially from fall 2007 to summer 2008 include:

- Ability groups (pretest  $M = 0.40$ ; posttest  $M = 0.00$ ;  $d = -0.57$ )
- Work Centers (pretest  $M = 0.60$ ; posttest  $M = 0.00$ ;  $d = -0.57$ )
- Teacher acting as coach/facilitator (pretest  $M = 3.40$ ; posttest  $M = 2.87$ ;  $d = -1.09$ )
- Independent seatwork (pretest  $M = 0.30$ ; posttest  $M = 0.03$ ;  $d = -0.50$ )
- Technology as a learning/tool or resource (pretest  $M = 3.70$ ; posttest  $M = 3.00$ ;  $d = -0.82$ )

**TABLE 4: Pre and Post - SOM**

SOM Dimension	Pre (Fall 07)		Post (Win/Spr 08)		<i>t</i> ( <i>df</i> = 4)	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<b>Instructional Orientation</b>							
Direct instruction	1.10	1.34	2.57	0.99	-2.57	0.06	1.12
Team teaching	0.00	0.00	0.00	0.00			
Cooperative/collaborative learning	1.60	1.82	1.80	1.10	-0.18	0.87	0.12
Individual tutoring	0.00	0.00	0.00	0.00			
<b>Classroom Organization</b>							
Ability groups	0.40	0.89	0.00	0.00	1.00	0.37	-0.57
Multi-age grouping	0.00	0.00	0.00	0.00			
Work centers	0.60	1.34	0.00	0.00	1.00	0.37	-0.57
<b>Instructional Strategies</b>							
Higher-level instructional feedback (written or verbal) to enhance student learning	1.40	1.52	1.53	1.14	-0.44	0.68	0.09
Integration of subject areas	0.00	0.00	0.00	0.00			
Project-based learning	0.10	0.22	0.73	1.01	-1.55	0.20	0.78
Use of higher-level questioning	1.80	1.30	1.87	0.84	-0.14	0.90	0.05
Teacher acting as coach/facilitator	3.40	0.55	2.87	0.30	2.36	0.08	-1.09
Parent/community involvement	0.00	0.00	0.00	0.00			
<b>Student Activities</b>							
Independent seatwork (self-paced worksheets)	0.30	0.67	0.03	0.07	1.00	0.37	-0.50
Experiential, hands-on learning	0.40	0.89	0.57	0.66	-0.67	0.54	0.19
Systematic individual instruction	0.00	0.00	0.00	0.00			
Sustained writing/composition	0.40	0.89	0.23	0.52	1.00	0.37	-0.21
Sustained reading	0.00	0.00	0.00	0.00			
Independent inquiry/research on the part of students	1.40	0.89	2.10	0.82	-1.51	0.21	0.74
Student discussion	0.00	0.00	0.00	0.00			
<b>Technology Use</b>							
Computer for instructional delivery (e.g., CAI, drill & practice)	1.20	1.30	1.40	0.96	-0.21	0.84	0.16
Technology as a learning tool or resource (e.g., Internet research, etc.)	3.70	0.45	3.00	1.00	1.20	0.30	-0.82
<b>Assessment</b>							
Performance assessment	0.00	0.00	0.30	0.67	-1.00	0.37	0.57
Student self-assessment	0.00	0.00	0.00	0.00			
<b>Summary Items</b>							
High academically focused class time	3.80	0.45	3.80	0.45	0.00	1.00	0.00
High level of student attention/interest/engagement	3.70	0.45	3.63	0.36	0.39	0.72	-0.15

### ***Posttest-Comparative norm Sample Differences on the School Observation Measure (SOM)***

Although the small sample size inhibited finding statistical significance when contrasting the posttest SOM mean scores with those obtained for the comparative norm sample, at least one highly significance difference was observed among the practices observed, along with three other marginal differences. As Table 5 indicates, at the McNairy schools, the posttest emphasis on “independent seatwork” ( $M = 0.03$ ) appeared to be far below that observed for the comparative norm sample ( $M = 1.37$ ), with respect to the results of a one-sample  $t$ -test ( $tp < .001$ ,  $d = -11.24$ ). Although only marginally significant in a statistical sense, the results of contrasting the McNairy schools’ posttest SOM means with those of the comparative norm sample indicated a more substantial emphasis among the McNairy schools in “the teacher acting as a coach/facilitator” (McNairy  $M = 2.87$ ; Sample  $M = 2.45$ ;  $d = 0.88$ ), on “independent inquiry/research on the part of students” (McNairy  $M = 2.10$ ; Sample  $M = 0.60$ ;  $d = 1.14$ ), and on “technology as a learning/tool or resource” (McNairy  $M = 3.00$ ; Sample  $M = 1.18$ ;  $d = 1.14$ ).

**TABLE 5: Post and Comparative Norm - SOM**

SOM Dimension	Post (Win/Spr 08)		Comparative Norms		<i>t</i> ( <i>df</i> = 4)	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Direct instruction	2.57	0.99	2.63	1.45	0.14	0.90	-0.04
Team teaching	0.00	0.00	0.51	1.21			
Cooperative learning	1.80	1.10	0.97	1.48	1.69	0.17	0.47
Individual tutoring	0.00	0.00	0.26	0.8			
Ability groups	0.00	0.00	0.48	1.21			
Multi-age grouping	0.00	0.00	0.52	1.35			
Work centers	0.00	0.00	0.89	1.5			
Higher-level instructional feedback	1.53	1.14	1.15	1.4	0.75	0.50	0.21
Integration of subject areas	0.00	0.00	0.38	1.04			
Project-based learning	0.73	1.01	0.62	1.36	0.24	0.82	0.07
Higher-level questioning	1.87	0.84	1.69	1.59	0.48	0.66	0.13
Teacher as a coach/facilitator	2.87	0.30	2.45	1.57	3.13	0.04	0.88
Parent involvement	0.00	0.00	0.09	0.56			
Independent seatwork	0.03	0.07	1.37	1.47	42.80	0.00	-11.24
Experiential, hands-on learning	0.57	0.66	1.04	1.5	1.59	0.19	-0.45
Systematic individual instruction	0.00	0.00	0.09	0.59			
Sustained writing	0.23	0.52	0.25	0.76	0.09	0.94	-0.02
Sustained reading	0.00	0.00	0.26	0.8			
Student Independent research	2.10	0.82	0.6	1.28	4.09	0.02	1.14
Student discussion	0.00	0.00	0.95	1.44			
Computer for instructional delivery	1.40	0.96	1.6	1.7	0.47	0.67	-0.13
Technology as a learning tool	3.00	1.00	1.18	1.62	4.07	0.02	1.14
Performance assessment	0.30	0.67	0.48	1.16	1.00	0.37	-0.17
Student self-assessment	0.00	0.00	0.19	0.82			
High academically focused class time	3.80	0.45	3.48	0.83	1.59	0.19	0.45
High level of student attention/interest/engagement	3.63	0.36	3.39	0.87	1.49	0.21	0.42

## **Observation of Computer Use (OCU)**

There were 11 or more computers available for use during all observation periods, with the vast majority being up-to-date systems (95.2% of total computers observed). All computers (100%) were connected to the Internet. Not surprisingly, student use of laptops was observed during *all* targeted visits. One-to-one use of the laptops was observed during 69.3% of the visits, whereas, during 25.4% of the visits the laptops were used by pairs or small groups of students (see Table 6). By the final observation, the majority (85.7%) of the students exhibited moderate computer literacy skills, while a small percentage (14.3%) showed very good keyboarding skills. Teachers used three software applications during targeted visits. In almost 80% (78.2%) of the visits, students frequently to extensively used Internet browsers, and in 60% (59.4%) of the visits students were observed using word processing. Frequent use of the following types of software was seen less often: presentation (34.5%), problem-solving (22%), draw/paint/graphics (22.0%), CD-reference materials (21.9%), drill and practice (18.5%), and spreadsheets (12.5%).

***Meaningfulness of Computer Activities.*** The targeted OCU revealed very positive results with regard to MCSL teachers implementing lessons that engaged students in meaningful and very meaningful activities (Table 6). Specifically, the majority (82.0%) of computer activities observed in 39 MCSL classes were considered to be meaningful (81.3%) or very meaningful (62.6%). In contrast, low-level use of computers was observed frequently to extensively in only 6.2% of visits.

The subject areas of Internet activities were primarily focused on language arts (59.4%), as well as social studies (43.8%) and science (31.3%). A similar pattern is seen for production tools, with the largest percentage (62.5%) of computer activities involving production tools being focused on language arts.

**TABLE 6. OCU Data Summary**

Number of Observations for Survey Period 1      Fall 2007      N = 6  
 Number of Observations for Survey Period 2      Winter 2008      N = 7  
 Number of Observations for Survey Period 3      Spring 2008      N = 7

<b>Classroom computers or digital tools were most frequently used by:</b>			
<b>Survey Period</b>	<b>1</b>	<b>2</b>	<b>3</b>
Few (less than 10%) students	0.0	0.0	0.0
Some (about 10-50%) students	0.0	0.0	0.0
Most (about 51-90%) students	0.0	0.0	0.0
Nearly all (91%-100%) students	100.0	85.7	100.0
Students did not use computers	0.0	14.3	0.0

<b>Students most frequently worked with computers or digital tools:</b>			
Alone	66.7	57.1	85.7
In pairs	16.7	0.0	14.3
In small groups	16.7	28.6	0.0
Students did not use computers	0.0	14.3	0.0

<b>Student computer literacy skills were most frequently:</b>			
Poor	0.0	0.0	0.0
Moderate	16.7	57.1	85.7
Very good	83.3	28.6	14.3
Not observed	0.0	14.3	0.0

<b>Student keyboarding skills were most frequently:</b>			
Poor	0.0	0.0	28.6
Moderate	16.7	57.1	42.9
Very good	83.3	14.3	14.3
Not observed	0.0	28.6	14.3

<b>Type of computers used by students</b>	<b>% Not Observed</b>			<b>% Rarely</b>			<b>% Occasionally</b>			<b>% Frequently</b>			<b>% Extensively</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>
Desktop Computers	100.0	85.7	85.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	14.3	0.0
Laptop Computers	0.0	14.3	14.3	0.0	14.3	0.0	0.0	0.0	14.3	16.7	0.0	0.0	83.3	71.4	71.4



Production Tools Used by Students	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Word Processing	50.0	57.1	57.1	0.0	0.0	0.0	0.0	14.3	0.0	16.7	0.0	42.9	33.3	28.6	0.0
Database	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spreadsheet	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Draw/Paint/Graphics/Photo-imaging	83.3	100.0	85.7	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0
Presentation (e.g., MS PowerPoint)	33.3	100.0	57.1	0.0	0.0	14.3	0.0	0.0	14.3	0.0	0.0	0.0	66.7	0.0	14.3
Authoring (e.g., HyperStudio)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concept Mapping (e.g., Inspiration)	100.0	57.1	85.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	42.9	0.0
Planning (e.g., MS Project)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Digital Audio (e.g., Audacity)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Digital Video (e.g., Movie Maker)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (please describe)	100.0	100.0	57.1	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	14.3	0.0	0.0	14.3

Indicate all subject areas involved with the use of Production Tools:	Survey Period	1	2	3
Language Arts		16.7	28.6	28.6
Mathematics		16.7	0.0	0.0
Science		33.3	28.6	28.6
Social Studies		33.3	14.3	14.3
None		0.0	28.6	28.6

Internet/Research Tools	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Information Search	16.7	57.1	14.3	0.0	0.0	0.0	16.7	14.3	14.3	50.0	14.3	14.3	16.7	14.3	57.1
Web Posting (e.g., Wiki, Podcast)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interactive Learning (e.g., live cams)	100.0	85.7	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0
CD Reference (encyclopedias, etc.)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Synchronous Communication (chats)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asynchronous Communication (email)	100.0	100.0	85.7	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0
Other (please describe)	100.0	100.0	57.1	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0

Indicate all subject areas involved with the use of Internet/Research Tools:	Survey Period	1	2	3
Language Arts		0.0	14.3	28.6
Mathematics		16.7	0.0	28.6
Science		33.3	28.6	28.6
Social Studies		33.3	14.3	28.6

Indicate all subject areas involved with the use of Internet/Research Tools:	Survey Period	1	2	3
None		16.7	42.9	0.0

Educational Software	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Drill/Practice/Tutorial	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Problem Solving (Oregon Trail)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Process Tools	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (please describe)	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Testing Software	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Individualized/Tracked	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generic	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (please describe)	100.0	100.0	85.7	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Levels of computer activity were observed.	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>Low level use of computers:</b> Activities in general required no critical thinking, e.g., used computer applications for copying text or drawing, drill & practice, tutorials, or games.	50.0	100.0	71.4	33.3	0.0	28.6	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Somewhat meaningful use of computers:</b> Activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.	66.7	71.4	57.1	0.0	14.3	0.0	16.7	14.3	14.3	16.7	0.0	28.6	0.0	0.0	0.0
<b>Meaningful use of computers:</b> Activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.	0.0	42.9	42.9	0.0	0.0	0.0	16.7	0.0	0.0	50.0	14.3	28.6	33.3	42.9	28.6

Levels of computer activity were observed.	% Not Observed			% Rarely			% Occasionally			% Frequently			% Extensively		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>Very meaningful use of computers:</b> Activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.	66.7	57.1	71.4	33.3	0.0	0.0	0.0	0.0	0.0	0.0	28.6	14.3	0.0	14.3	14.3

## OCU Inferential Results: MCS Laptop Program vs. Comparison Norms

Presented in a manner similar to the results obtained for the targeted *SOM*, Tables 7 and 8 show the means and standard deviations derived from the targeted administration of the *Observation of Computer Use (OCU)*. As with the *SOM*, fall *OCU* means were treated as pretest observations and the composite of winter and spring *OCU* means were treated as posttest observations. On these two sets of means, a series of dependent or correlated *t*-tests were conducted to determine whether statistically significant differences were observed between pairs of *OCU* means, followed by the computation of standardized effect sizes.

In Table 8, posttest observations on the *OCU* that were obtained in the five McNairy schools are contrasted with corresponding “test values” recently obtained from a comparative norm sample of 170 schools. To determine whether statistically significant differences separated the posttest values obtained for the McNairy schools and the comparative norm sample’s “test values,” a series of one-sample *t*-tests were conducted and standardized effect sizes subsequently computed for all of the *OCU* items.

### ***Pretest-Posttest Differences on the Observation of Computer Use (OCU)***

As was true with testing for statistically significant differences on the *SOM* items, the small sample size and correlative lack of statistical power also inhibited finding such differences on the *OCU*. Indicative, however, of substantive change over time are several effect sizes at or above one half of a standard deviation that were observed with respect to several *OCU* items.

Among **Application software tools**, the use of “Concept Mapping” (pretest  $M = 0.00$ ; posttest  $M = 1.23$ ;  $d = 1.04$ ) and “Other Application Software” *increased* (pretest  $M = 0.00$ ; posttest  $M = 0.50$ ;  $d = 0.90$ ), while use of “Word Processing” (pretest  $M = 1.80$ ; posttest  $M = 0.83$ ), “Graphics” (pretest  $M = 0.80$ ; posttest  $M = 0.10$ ;) and “Presentation” software (pretest  $M = 2.40$ ; posttest  $M = 0.50$ ) appears to have *declined* somewhat at the McNairy schools.

Among **Internet/Research tools**, “Interactive Learning” (pretest  $M = 0.00$ ,  $SD = 0.00$ ; posttest  $M = 0.40$ ) “Asynchronous Communication” (pretest  $M = 0.00$ ; posttest  $M = 0.07$ ), and “Other” usages (pretest  $M = 0.00$ ; posttest  $M = 0.63$ ) appears similarly to have *increased*, as has the use of “Other” **Testing** software (pretest  $M = 0.00$ ; posttest  $M = 0.03$ ).

Among items concerned with **Overall Meaningful Use**, there was sharp decline in the observed frequency of computer use having “low meaning” (pretest  $M = 0.60$ ; posttest  $M = 0.07$ ) In fact, so marked was the decrease in “low level” computer activity that the pretest-posttest difference approached statistical significance at the conventional alpha level ( $p = 0.08$ ).

**TABLE 7: Pre and Post - OCU**

Application	Pre (Fall 07)		Post (Win/Spr 08)		<i>t</i> ( <i>df</i> = 4)	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Word Processing	1.80	1.79	0.83	1.21	1.30	0.26	-0.57
Database	0.00	0.00	0.00	0.00			
Spreadsheet	0.00	0.00	0.00	0.00			
Draw/Paint/Graphics	0.80	1.79	0.10	0.22	0.84	0.45	-0.50
Presentation	2.40	2.19	0.50	0.87	1.55	0.20	-1.03
Authoring	0.00	0.00	0.00	0.00			
Concept Mapping	0.00	0.00	1.23	1.51	-1.83	0.14	1.04
Planning	0.00	0.00	0.00	0.00			
Digital Audio	0.00	0.00	0.00	0.00			
Digital Video	0.00	0.00	0.00	0.00			
Other (please describe)	0.00	0.00	0.50	0.71	-1.58	0.19	0.90
<b>Internet/Research Tools</b>							
Information Search	2.70	0.97	2.27	0.69	0.92	0.41	-0.46
Web Posting	0.00	0.00	0.00	0.00			
Interactive Learning	0.00	0.00	0.40	0.89	-1.00	0.37	0.57
CD Reference	0.00	0.00	0.00	0.00			
Synchronous Communication	0.00	0.00	0.00	0.00			
Asynchronous Communication	0.00	0.00	0.07	0.15	-1.00	0.37	0.57
Other (please describe)	0.00	0.00	0.63	0.79	-1.78	0.15	1.02
<b>Educational Software</b>							
Drill/Practice/Tutorial	0.00	0.00	0.00	0.00			
Problem Solving (Oregon Trail)	0.00	0.00	0.00	0.00			
Process Tools	0.00	0.00	0.00	0.00			
Other (please describe)	0.00	0.00	0.00	0.00			
<b>Testing Software</b>							
Individualized/Tracked	0.00	0.00	0.00	0.00			
Generic	0.00	0.00	0.00	0.00			
Other (please describe)	0.00	0.00	0.03	0.07	-1.00	0.37	0.57
<b>Overall Meaningful Use</b>							
Low level use of computers	0.60	0.55	0.07	0.15	2.36	0.08	-1.20
Somewhat meaningful use of computers	0.70	0.97	0.57	0.78	0.24	0.82	-0.14
Meaningful use of computers	3.20	0.45	2.50	1.87	0.88	0.43	-0.46
Very meaningful use of computers	0.40	0.55	0.77	1.09	-0.67	0.54	0.38

### ***Posttest and Comparative Norm Differences on the Observation of Computer Use (OCU)***

Despite the small sample size, means on at least two OCU items evidenced a highly significant difference with means obtained for the comparative norm sample when one sample *t*-tests were conducted. In addition to these two items, robust effect sizes at or above one-half of a standard deviation and favoring the McNairy schools were observed on two other OCU items. As indicated in Table 8, differences in the frequency with which “Internet Browsers” were used for an “Information Search” at McNairy schools ( $M = 2.27$ ) far exceeded that of the 170 schools within the comparative norm sample ( $M = 0.75$ ), given the results of the one sample *t*-test ( $p < 0.01$ ,  $d = 1.37$ ) Although not statistically significant, the frequency of use of “Concept Mapping” software at McNairy schools ( $M = 1.23$ ) also outpaced the usage observed for the comparative norm sample ( $M = 0.04$ ) as indicated by the robust effect size computed for the difference ( $d = 0.50$ ).

Conversely, the frequency with which “low level” uses of the computers were observed for McNairy schools ( $M = 0.07$ ) was significantly *lower* than that observed for the comparative norm sample ( $M = 0.54$ ), according to the one sample *t*-test results and as suggested by the very large effect size associated with the difference ( $p < .001$ ,  $d = -1.97$ ). Consistent with these results were those obtained for the *OCU* item concerning the “meaningful use of computers” Although the *t*-test results were not statistically significant ( $p = 0.09$ ,  $d = 0.61$ ), the robust effect size associated with the difference between the usage seen at the five McNairy schools ( $M = 2.50$ ) versus such usage at the 170 schools constituting the comparative norm sample ( $M = 0.66$ ) should be noted.

**TABLE 8: Post and Comparative - OCU**

Application	Post (Win/Spr 08)		Comparative Norms		<i>t</i> ( <i>df</i> = 4)	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Word Processing	0.83	1.21	0.21	0.80	1.15	0.31	0.32
Database	0.00	0.00	0.02	0.23			
Spreadsheet	0.00	0.00	0.07	0.49			
Draw/Paint/Graphics/Photo-imaging	0.10	0.22	0.07	0.49	0.30	0.78	0.08
Presentation (e.g., MS PowerPoint)	0.50	0.87	0.13	0.60	1.14	0.32	0.27
Authoring (e.g., html)	0.00	0.00	0.00	0.00			
Concept Mapping (e.g., Inspiration)	1.23	1.51	0.04	0.29	1.77	0.15	0.50
Planning (e.g., MS Project)	0.00	0.00	0.01	0.15			
Digital Audio (e.g., Audacity)	0.00	0.00					
Digital Video (e.g., Movie Maker)	0.00	0.00					
Other (please describe)	0.50	0.71	0.07	0.47	1.36	0.25	0.38
<b>Internet/Research Tools</b>							
Information Search (e.g., Netscape)	2.27	0.69	0.75	1.40	4.89	0.01	1.37
Web Posting (e.g., Wiki, Podcast)	0.00	0.00					
Interactive Learning (e.g., live cams, virtual manipulatives)	0.40	0.89					
CD Reference (encyclopedias, etc.)	0.00	0.00	0.04	0.29			
Synchronous Communication (e.g., chats)	0.00	0.00	0.02	0.31			
Asynchronous Communication (e.g., email)	0.07	0.15	0.02	0.31	0.70	0.52	0.18
Other (please describe)	0.63	0.79	0.04	0.38	1.67	0.17	0.47
<b>Educational Software</b>							
Drill/Practice/Tutorial	0.00	0.00	0.84	1.48			
Problem Solving (Oregon Trail, SimCity, etc.)	0.00	0.00	0.03	0.25			
Process Tools (Geometer's Sketchpad, etc.)	0.00	0.00	0.04	0.34			
Other (please describe)	0.00	0.00	0.04	0.32			
<b>Testing Software</b>							
Individualized/Tracked (e.g., Accelerated Reader)	0.00	0.00	0.10	0.48			
Generic	0.00	0.00	0.00	0.00			
Other (please describe)	0.03	0.07	0.02	0.31	0.40	0.71	0.08
<b>Overall Meaningful Use</b>							
Low level use of computers	0.07	0.15	0.54	1.19	7.10	0.00	-1.97
Somewhat meaningful use of computers	0.57	0.78	0.65	1.33	0.24	0.82	-0.06
Meaningful use of computers	2.50	1.87	0.66	1.31	2.20	0.09	0.61
Very meaningful use of computers	0.77	1.09	0.38	1.08	0.78	0.48	0.22

## **Survey Results**

Survey results for the MCSL program evaluation are reported below by MCSL students and teachers.

### **Teacher Technology Questionnaire (TTQ)**

For the school year 2007 – 2008 descriptive statistics for the TTQ were based on the responses of 5 teachers (Table 9). 100% of the respondents identified themselves as having a computer and having good (60%) or very good (40%) computer skills. The majority of respondents access instructional materials online at home (80%), while all stated they used their home computers to prepare instructional materials. The majority of respondents were female (80%), while all taught in middle school settings. Most had between 6-10 years of experience teaching (60%).

Respondents had 100% agreement on most survey items, and viewed the laptops very positively (“I love to see their eyes light up when they grasp a concept that is difficult for them to understand in the standard classroom setting,” “I’m excited to watch the students interact with each other,” “The one thing I am most excited about is when I can see that real learning took place, not only in the area of content but improvement in technology as well.”). There were exceptions to this pattern of responses noted for certain items such as items about parents/caregivers and community members support of the school’s laptop program, their school having a well-developed technology plan, and other teachers being supportive of the laptop program, where only 60% of respondents agreed or highly agreed with the item. Overall support for technology in the school was ranked the lowest of the averaged responses at 4.05 (Strongly Disagree = 1, Strongly Agree = 5), with technical support and impact on classroom instruction tying for the next lowest category of response (4.95). The results of these categories were echoed in the open-ended comment section of the survey as well. When asked about their biggest disappointments, teachers responded with comments such as “The biggest disappointment has been the lack of support throughout the county. Parent and community leaders ...support us, but others do not see the importance of the program or how it can improve our students and their learning” and “The lack of interest from other teachers and community support. For many it is still not viewed as a way to invigorate students about the curriculum.”



**TABLE 9. Teacher Technology Questionnaire Summary Data**

N = 5

How would you rate your level of computer ability?	
Very Good	40.0
Good	60.0
Moderate	0.0
Poor	0.0
No Ability	0.0
Do you own a home computer?	
Yes	100.0
No	0.0
If yes, do you use your home computer to access instructional materials on the Internet?	
Yes	80.0
No	20.0
If yes, do you use your home computer to prepare instructional materials?	
Yes	100.0
No	0.0
How many years have you been teaching?	
Less than one year	0.0
1-5 years	40.0
6-10 years	60.0
11-15 years	0.0
More than 15 years	0.0
What is your age group?	
29 years or less	20.0
30-39 years	60.0
40-49 years	20.0
50-59 years	0.0
60 years or older	0.0
What is your gender?	
Female	80.0
Male	20.0
What grade level do you primarily teach?	
Early Childhood	0.0
Elementary	0.0
Middle/Junior High	100.0
High School	0.0
What is your current position at this school?	
Teacher	100.0
Student Teacher	0.0
Educational Support Staff (e.g., librarian, counselor)	0.0
Administrator	0.0
Other	0.0

Indicate the extent to which you agree with each of the following items:	% Strongly Agree & Agree	% Neutral	% Strongly Disagree & Disagree
Most of our laptops are kept in good working condition.	100.0	0.0	0.0
I can readily obtain answers to technology-related questions.	100.0	0.0	0.0
The use of laptops has increased the level of student interaction and/or collaboration.	100.0	0.0	0.0
Parents/Caregivers and community members support our school's laptop program.	60.0	20.0	20.0
I know how to meaningfully integrate the laptops into lessons.	100.0	0.0	0.0
My students have adequate access to up-to-date technology resources.	100.0	0.0	0.0
Materials (e.g., software, printer supplies) for classroom use of the laptops are readily available.	100.0	0.0	0.0
Integration of the laptops has positively impacted student learning and achievement.	100.0	0.0	0.0
I am able to align use of the laptops with my district's standards-based curriculum.	100.0	0.0	0.0
Most of my students can capably use the laptops at an age-appropriate level.	100.0	0.0	0.0
I have received adequate training to incorporate the laptops into my instruction.	100.0	0.0	0.0
My computer skills are adequate to conduct classes that have students using the laptops.	100.0	0.0	0.0
Teachers receive adequate administrative support to integrate the laptops into classroom practices.	100.0	0.0	0.0
My teaching is more student-centered when the laptops are integrated into the lessons.	100.0	0.0	0.0
Our school has a well-developed technology plan that guides all technology integration efforts.	60.0	40.0	0.0
I routinely integrate the use of laptops into my instruction.	100.0	0.0	0.0
The teachers in this school are generally supportive of the laptop program.	60.0	40.0	0.0
The laptop program has changed classroom learning activities in a very positive way.	100.0	0.0	0.0
The use of the laptops has improved the quality of student work.	100.0	0.0	0.0
My teaching is more interactive when laptops are integrated into the lessons.	100.0	0.0	0.0

**Dimension Summary**

#	Dimension	2007 - 2008
1	Impact on Classroom Instruction	4.95
2	Impact on Students	5.00
3	Overall Support for Technology in the School	4.05
4	Teacher Readiness to Integrate Technology	5.00
5	Technical Support	4.95
6	<b>OVERALL</b>	4.79

## **Student Technology Questionnaire (STQ)**

The Student Technology Questionnaire was completed by 373 students, in the 4<sup>th</sup> - 8<sup>th</sup> grade, in classrooms equipped with MCSL laptops. The results are shown in Table 10. In general, the results revealed positive student attitudes about using laptop computers in the classrooms. The strongest level of agreement was seen when students were asked if they were glad they got to use laptops, as a “Yes” response was given by nearly 100% (96.5%) of the students, which was also evidenced by comments such as “I love using the computers and I wish i didn't have to quit using them”. Similarly, 95.4% of the students indicated they would like to use laptops again next year, a finding supported by comments such as “I learn better with laptops and concentrate on my work more. I want them next year. They are awesome.” and “I learn more about everything and I hope to use them next year.” The majority of the students also agreed that use of the laptops had improved their Internet research skills (79.1%), made it easier to do school work (70.0%), improved their computer skills (76.9%), made them more interested in learning (76.1%), and would help them get better jobs in the future (69.2%). A majority of students responded that using a laptop made them want to get better grades (61.7%), as well as caused them to look forward to schoolwork (62.5%). Students also identified laptop use as improving their schoolwork (61.1%) and causing them to think more about the subjects they are learning (68.1%). Approximately half of the respondents reported using a laptop helps them remember more and do better on tests (53.9%) and makes them a better student (48.8%). Students revealed less positive agreement that laptops improved their writing (32.2%).

When asked how they used the MCSL laptops, the majority of students indicated that they most frequently worked alone (76.4%), however, almost half (45.8%) reported that they also frequently worked with one other student during laptop activities, as evidenced by comments like “It lets us have more fun @ get to work with other students more in this class more than in the others.” Students indicated that they most frequently used the laptops for science (37.5%) and social studies (32.4%), whereas the least frequent use was reported for mathematics (27.1%) and language arts (19.0%). Nearly 90% (87.1%) of the students indicated that they frequently used the Internet for class activities, while more than 75% (76.4%) reported frequent use of presentations (PowerPoint). Other software use ranged from 55.2% for word processing (MS Word) and 56% for concept mapping (Inspiration) to a low of 11.0% for digital editing (Movie Maker) and 10.2% for authoring software (html editing).

**TABLE 10. Student Technology Questionnaire Summary Data**

N = 373      Respondent Demographics: Percentages by Categories\*

<b>Grade Level:</b>	
4	10.5
5	42.9
6	24.1
7	13.1
8	8.0

  

<b>Subject:</b>	
Language Arts	18.5
Mathematics	24.4
Science	37.3
Social Studies	18.5
Other	0.0

  

<b>How often do you use the laptop in the following ways while in the classroom?</b>	<b>% Frequently &amp; A Lot</b>	<b>% Occasionally</b>	<b>% Never and Rarely</b>
By Yourself	76.4	13.9	8.6
With one other student	45.8	38.3	14.2
In groups of 3 or more students	21.2	30.0	46.9

  

<b>How often do you use the laptop for the following subjects?</b>			
Language Arts	19.0	10.2	68.1
Mathematics	27.1	7.0	64.1
Sciences	37.5	9.4	50.1
Social Studies	32.4	12.6	53.1

  

<b>How often do you use the following software when doing class activities with your laptop?</b>			
Word Processing (MS Word)	55.2	21.2	22.3
Spreadsheets (Excel)	24.9	18.0	56.0
Presentation (PowerPoint)	76.4	15.8	7.0
Internet (Explorer/Netscape)	87.1	5.4	6.4
Movie Maker - Digital Editing	11.0	12.1	75.3
Inspiration	56.0	22.8	19.6
Educational Software (e.g., math practice)	48.5	18.8	31.1
Games	22.3	33.0	43.4
CD Reference (e.g., Encarta)	16.1	14.2	68.6
Authoring (e.g., html)	10.2	9.4	78.3
Other (please list name below)	13.1	8.0	74.0

<b>Personal Impact on Students</b>	<b>% No</b>	<b>% Some</b>	<b>% Yes</b>
My computer skills have improved because I use a laptop at school.	1.1	20.9	76.9
Using a laptop in class has made me more interested in learning.	3.5	19.3	76.1
Using a laptop has made me want to get better grades.	9.9	26.8	61.7
My writing has improved because I use a laptop.	35.1	31.4	32.2
My Internet research skills have improved since using the laptops.	2.7	17.2	79.1
The laptop makes it easier to work with other students.	5.6	26.3	67.0
I am very glad that I get to use laptops.	0.3	1.9	96.5
I would like to use laptop computers again next year.	1.1	2.4	95.4
I learn more when I use a laptop computer	2.7	29.8	66.5
It is easier to do my schoolwork when I use a laptop.	6.4	22.5	70.0
I look forward to schoolwork because I get to use a laptop.	7.5	28.7	62.5
I will be able to get a better job because I have good computer skills.	6.7	23.1	69.2
Using laptops will make me a better student.	12.6	36.5	48.8
Using a laptop helps me to remember more and do better on tests.	10.5	34.3	53.9
My schoolwork is better when I use the laptop.	7.2	30.6	61.1
Using the laptop makes me think more about the subject we are learning.	6.7	24.1	68.1

## **STQ Inferential Results: MCS Laptop Teachers vs. Comparison Norms**

### ***Results for the Student Technology Questionnaire (STQ)***

For 369 McNairy County students at five schools, item frequencies and percentages relevant to the different sections of the *Student Technology Questionnaire (STQ)* are presented in Tables 11 and 12. Also provided in the two tables are the results of contrasting the *STQ* responses of McNairy County students with those of a comparative norm sample of 4081 students involved in a similar initiative at 36 schools in another state. Presented along with the item means and standard deviations for the two groups are the one-sample *t*-test values and the standardized effect sizes (*d*) computed from the difference between the item means for McNairy County students and the “test value” item means for the students in the comparative norm sample.

### ***STQ Personal Impact on Students***

As Table 11 shows, highly significant differences (at  $p < .001$ ) between the means computed for McNairy County students and the ones computed for the 4081 students in the comparative norm sample were observed for 13 of the 16 “personal impact” items in the first section of the *STQ*. Associated with effect sizes of one-half of a standard deviation or more, especially robust differences favoring McNairy student means over values obtained for the comparative norm sample were observed for the following six items, four of which directly concern students’ motivation to learn:

- I am very glad that I get to use laptops. ( $M = 2.98, d = 1.00$ )
- Using the laptop makes me think more about the subject we are learning. ( $M = 2.62, d = 0.65$ ).
- I look forward to schoolwork because I get to use a laptop. ( $M = 2.56, d = 0.65$ )
- Using a laptop has made me want to get better grades. ( $M = 2.53, d = 0.67$ )
- Using a laptop in class has made me more interested in learning. ( $M = 2.73, d = 0.59$ ).
- The laptop makes it easier to work with other students. ( $M = 2.62, d = 0.55$ )

Interestingly, however, means obtained on two *STQ* items concerned with students’ self-assessed improvement in schoolwork—specifically, “My writing has improved because I use a laptop” ( $M = 1.97, d = -0.01$ ) and “Using laptops will make me a better student” ( $M = 2.37, d = 0.04$ ) evidenced no differences with test values obtained for the comparative norm sample. Further, only a marginal statistical difference between the McNairy student mean and that obtained for the norm was observed for the performance-oriented item “It is easier to do my schoolwork when I use a laptop” ( $M = 2.64, d = 0.16$ ).

**TABLE 11: Post and Comparative Norms – STQ – PERSONAL IMPACT**

STQ Item	N	No		Some		Yes		McNairy		Norms		Contrasts	
		n	%	n	%	n	%	M	SD	M	SD	t	d
My computer skills have improved because I use a laptop at school.	369	4	1.1	78	21.1	287	77.8	2.77	0.45	2.55	0.64	5.2***	0.48
Using a laptop in class has made me more interested in learning.	369	13	3.5	72	19.5	284	77.0	2.73	0.52	2.43	0.72	11.1***	0.59
Using a laptop has made me want to get better grades.	367	37	10.1	100	27.2	230	62.7	2.53	0.67	2.09	0.80	12.6***	0.64
My writing has improved because I use a laptop.	368	131	35.6	117	31.8	120	32.6	1.97	0.83	1.98	0.82	0.24	-0.01
My Internet research skills have improved since using the laptops.	369	10	2.7	64	17.3	295	79.9	2.77	0.48	2.58	0.66	7.6***	0.40
The laptop makes it easier to work with other students.	369	21	5.7	98	26.6	250	67.8	2.62	0.59	2.29	0.76	10.7***	0.55
I am very glad that I get to use laptops.	368	1	0.3	7	1.9	360	97.8	2.98	0.17	2.80	0.48	20.3***	1.00
I would like to use laptop computers again next year.	369*	4	1.1	9	2.4	356	96.5	2.95	0.26	2.84	0.46	8.1***	0.44
I learn more when I use a laptop computer	369	10	2.7	111	30.1	248	67.2	2.64	0.53	2.42	0.67	8.0***	0.42
It is easier to do my schoolwork when I use a laptop.	369	24	6.5	84	22.8	261	70.7	2.64	0.60	2.55	0.65	2.9**	0.16
I look forward to schoolwork because I get to use a laptop.	368	28	7.6	107	29.1	233	63.3	2.56	0.63	2.14	0.80	12.8***	0.65
I will be able to get a better job because I have good computer skills.	369	25	6.8	86	23.3	258	69.9	2.63	0.61	2.51	0.65	3.8***	0.20
Using laptops will make me a better student.	365	47	12.9	136	37.3	182	49.9	2.37	0.70	2.34	0.71	0.82	0.04
Using a laptop helps me to remember more and do better on tests.	368	39	10.6	128	34.8	201	54.6	2.44	0.68	2.13	0.77	8.8***	0.46
My schoolwork is better when I use the laptop.	369	27	7.3	114	30.9	228	61.8	2.54	0.63	2.37	0.69	5.2***	0.27
Using the laptop makes me think more about the subject we are learning.	369	25	6.8	90	24.4	254	68.8	2.62	0.61	2.22	0.77	12.6***	0.65

### **STQ Instructional Context Items**

As contrasted with the results seen for items concerning “personal impact,” items in the second section of the *STQ* concerning a) the number of students using a laptop at a given time (either alone, in pairs, or in groups of three or more) and b) the number of subject matter areas in which the laptop was employed (in language arts, mathematics, science, or social studies) tended systematically to favor the comparative norm sample. Although no difference was observed between the norm value and McNairy student reports of how frequently they used computers “by themselves” ( $M = 4.18$ ,  $d = -0.09$ ), McNairy students indicated that they more often used laptops both “with one other student” ( $M = 3.45$ ,  $d = 0.59$ ) and “in groups of three or more students” ( $M = 2.73$ ,  $d = 0.53$ ). Further, McNairy students reported using the laptop significantly less often than the comparative norm sample in the subject matter areas of “mathematics” ( $M = 2.42$ ,  $d = -0.19$ ), “science” ( $M = 2.73$ ,  $d = -0.44$ ), “social studies” ( $M = 2.72$ ,  $d = -0.37$ ), and especially “language arts” ( $M = 2.12$ ,  $d = -1.12$ ).

### **STQ Software Use Items**

In terms of specific software applications cited in the third section of the *STQ*, the frequency with which McNairy students reported using “spreadsheets” ( $M = 2.40$ ) and “Internet Browsers” ( $M = 4.51$ ) did not appear to differ significantly from those reported by students in the comparative norm sample; and only marginal differences favoring the comparative norm sample were observed with respect to the frequency with which McNairy students reportedly engaged in computer “Gaming” ( $M = 2.83$ ) or employed “Authoring” software ( $M = 1.72$ ). Regarding four other major software applications, however, differences in the reported frequencies with which McNairy students and those in the comparative norm sample used “Word Processing,” “CD Reference,” “Presentation,” or “Educational” software appeared to be not only statistically significant but tended to run in opposing directions. With respect to the first pair of applications, McNairy students indicated that they used “Word Processing” ( $M = 3.58$ ,  $d = -0.40$ ) and “CD Reference” ( $M = 2.03$ ,  $d = -0.47$ ) software *much less often* than students in the comparative norm sample. Conversely, with respect to the second pair of applications, McNairy students indicated that they worked with “Presentation” ( $M = 4.18$ ,  $d = 0.62$ ) and “Educational” software ( $M = 3.29$ ,  $d = 0.58$ ) *much more often* than students in the comparative norm sample.



**TABLE 12: STQ Post and Comparative Norms: Instructional Context and Software Use**

STQ Item	N	Never		Rarely		Occas		Freq		A lot		McNairy		Norms		Contrasts	
		n	%	n	%	n	%	n	%	n	%	M	SD	M	SD	t	d
<b>Number of Students Using Computer</b>																	
By Yourself	369	6	1.6	26	7.0	52	14.1	97	26.3	188	50.9	4.18	1.02	4.27	1.03	1.70	-0.09
With one other student	367	7	1.9	46	12.5	143	39.0	118	32.2	53	14.4	3.45	0.95	2.88	1.07	11.5***	0.59
In groups of 3 or more students	366	33	9.0	142	38.8	112	30.6	47	12.8	32	8.7	2.73	1.08	2.16	1.15	10.1***	0.53
<b>Subject Matter Areas Where the Computer Was Used</b>																	
Language Arts	363	185	51.0	69	19.0	38	10.5	24	6.6	47	12.9	2.12	1.43	3.73	1.28	21.5***	-1.12
Mathematics	366	165	45.1	74	20.2	26	7.1	10	2.7	91	24.9	2.42	1.64	2.74	1.24	3.7***	-0.19
Sciences	362	150	41.4	37	10.2	35	9.7	40	11.0	100	27.6	2.73	1.71	3.48	1.17	8.4***	-0.44
Social Studies	366	111	30.3	87	23.8	47	12.8	34	9.3	87	23.8	2.72	1.56	3.31	1.35	7.2***	-0.37
<b>Software Applications Used</b>																	
Word Processing (MS Word)	368	37	10.1	46	12.5	79	21.5	78	21.2	128	34.8	3.58	1.34	4.12	1.25	7.7***	-0.40
Spreadsheets (Excel)	369	153	41.5	56	15.2	67	18.2	46	12.5	47	12.7	2.40	1.45	2.45	1.25	0.66	-0.04
Presentation (PowerPoint)	370	1	0.3	25	6.8	59	15.9	108	29.2	177	47.8	4.18	0.95	3.59	1.24	11.6***	0.62
Internet (Explorer/ Netscape)	369	10	2.7	14	3.8	20	5.4	58	15.7	267	72.4	4.51	0.96	4.52	0.99	0.20	-0.01
Movie Maker - Digital Editing	367	218	59.4	63	17.2	45	12.3	20	5.4	21	5.7	1.81	1.19	NA	NA	NA	
Inspiration	367	29	7.9	44	12.0	85	23.2	105	28.6	104	28.3	3.57	1.24	NA	NA	NA	
Educational Software (e.g., math practice)	367	64	17.4	52	14.2	70	19.1	76	20.7	105	28.6	3.29	1.45	2.45	1.43	11.1***	0.58
Games	368	17	4.6	145	39.4	123	33.4	49	13.3	34	9.2	2.83	1.03	2.95	1.37	2.2*	-0.11
CD Reference	369	183	49.6	73	19.8	53	14.4	38	10.3	22	6.0	2.03	1.26	2.62	1.42	9.0***	-0.47
Authoring (e.g., html)	365	228	62.5	64	17.5	35	9.6	24	6.6	14	3.8	1.72	1.12	1.85	1.23	2.2*	-0.12
Other	355	226	63.7	50	14.1	30	8.5	17	4.8	32	9.0	1.81	1.30	NA	NA	NA	NA

## **Technology Skills Assessment (TSA)**

A total of 7 teachers completed the Technology Skills Assessment. The results are presented in Table 13. Overall, respondent teachers were positive about their skills in using computers. Respondents agreed 100% with all items related to basic computer skills (use a spell check tool, create basic computer documents (word processed) in a timely manner, use help menus for software programs, use basic computer terms like mouse, keyboard, hard drive, CD-ROM, and monitor, save files to specific folders, locate and delete unwanted files, and print a document using "Print" from the File menu and/or the toolbar icon). 100% agreed with all items on the basic software skills section (use software preview features to check work, open and use software programs that are installed on your computer, work with and move between two open programs (e.g., Internet and database) to create a product, and describe the difference between downloading and installing software).

Respondents were more diverse in their responses to the basic Internet skills. Respondents agreed 100% that they were able to connect to the Internet with a modem (phone, cable) and determine the usefulness and appropriateness of digital information. Few respondents (14.3%) were able to use Boolean strategies for Internet searches.

The vast majority of respondents identified themselves as skilled with basic multimedia skills, with 100% stating they were able to play a CD on a computer, and 85.7% were able to use a scanner. Approximately half of the respondents (42.9%) were able to record and save their voice to a computer. Slightly more than a quarter of respondents (28.6%) were able to import digital video to a computer.

Respondents were diverse in their responses to questions about advanced computer skills. Respondents were more positive (85.7%) about their ability to use presentation software to share information with specific audiences. Approximately 50% (42.9%) responded they were capable of using appropriate digital layout and design to meet the needs of defined audiences, using appropriate digital layout and design for the selected media, publishing information in a variety of media, and printing to a specific printer on a network.

Use of technology for learning also yielded a diverse set of responses. Those completing the survey indicated at 100% agreement they were able to use appropriate software to express ideas and solve problems. A large majority (85.7%) indicated they were able to use multimedia software to enhance learning experiences, use text and graphics to create and modify solutions to problems, and use communication tools to participate in group projects. Almost 75% (71.4%) were able to create technology tools to assess student work. A minority of respondents (28.6%) indicated they were able to manipulate information in interactive digital environments, participate in synchronous and asynchronous online communication, and create an electronic teaching portfolio.

**TABLE 13. Technology Skills Assessment Summary Data**

N = 7

<b>Computer Basics: How easily can you ...</b>	<b>% Not at all</b>	<b>% Somewhat</b>	<b>% Very Easily</b>
Use a spell check tool.	0.0	0.0	100.0
Create basic computer documents (word processed) in a timely manner.	0.0	0.0	100.0
Use help menus for software programs.	0.0	0.0	100.0
Use basic computer terms like mouse, keyboard, hard drive, and monitor.	0.0	0.0	100.0
Save documents so they can be opened on both a Macintosh and PC.	0.0	14.3	85.7
Create folders on a hard drive or disk.	0.0	28.6	71.4
Save files to specific folders.	0.0	0.0	100.0
Locate and delete unwanted files.	0.0	0.0	100.0
Use keyboard commands to cut, copy, or delete text.	0.0	28.6	71.4
Proficiently use a mouse and keyboard.	0.0	14.3	85.7
Print a document using "Print" from the File menu and/or the toolbar icon.	0.0	0.0	100.0
<b>Software Basics: How easily can you ...</b>			
Use software preview features to check work.	0.0	0.0	100.0
Open and use software programs that are installed on your computer.	0.0	0.0	100.0
Work with and move between two open programs (e.g., Internet and database) to create a product.	0.0	0.0	100.0
Describe the difference between downloading and installing software.	0.0	0.0	100.0
Save documents so they can be opened in a different program (e.g., from Word to Word Perfect).	0.0	28.6	71.4
Install software.	0.0	42.9	57.1
<b>Multimedia Basics: How easily can you ...</b>			
Import digital video from a camera to a computer.	28.6	57.1	14.3
Record and save your voice onto a computer.	42.9	28.6	28.6
Use a scanner to import a photo or document into a computer.	0.0	14.3	85.7
Play a music CD on the computer.	0.0	0.0	100.0
<b>Internet Basics: How easily can you ...</b>			
Connect to the Internet with a modem (phone, cable).	0.0	0.0	100.0
Use Boolean strategies for Internet searches.	14.3	57.1	28.6
Use appropriate software and the Internet to find audio, video, and graphics for lesson plans.	0.0	28.6	71.4
Use the Internet to find help when you have a computer problem.	0.0	71.4	28.6
Determine if information you find on the Internet is accurate and valid.	0.0	0.0	71.4
Evaluate Internet search strategies to determine those that are most efficient.	0.0	42.9	57.1
Determine the usefulness and appropriateness of digital information.	0.0	0.0	100.0

<b>Advanced Skills: How easily can you</b>	<b>% Not at all</b>	<b>% Somewhat</b>	<b>% Very Easily</b>
Use more advanced computer terms like megahertz, gigabytes, and RAM.	71.4	0.0	28.6
Access information on local area networks (LANs) and wide area networks (WANs).	28.6	42.9	28.6
Use appropriate digital layout and design to meet the needs of defined audiences.	28.6	28.6	42.9
Use appropriate digital layout and design for the selected media (e.g., multimedia, web, print).	14.3	42.9	42.9
Publish information in a variety of media (e.g., printed, monitor display, web-based, video).	0.0	57.1	42.9
Connect a computer to a local server to share files.	28.6	42.9	28.6
Determine if a software program works with an operating system.	28.6	42.9	28.6
Print to a specific printer when connected to a network that has more than one printer.	0.0	57.1	42.9
Use presentation software to share information with specific audiences.	0.0	14.3	85.7
<b>Use Technology for Learning: How easily can you ...</b>			
Use multimedia software to enhance learning experiences.	0.0	14.3	85.7
Use appropriate software (e.g., word processing, graphics, databases, spreadsheets, simulations, and multimedia) to express ideas and solve problems.	0.0	0.0	100.0
Use text and graphics to create and modify solutions to problems.	0.0	14.3	85.7
Use digital audio and video to create and modify solutions to problems.	14.3	42.9	42.9
Use communication tools to participate in group projects.	0.0	14.3	85.7
Manipulate information in interactive digital environments (e.g., simulations, virtual labs, field trips).	0.0	71.4	28.6
Participate in a listserv, chat, and bulletin board session.	28.6	42.9	28.6
Create an electronic teaching portfolio to evaluate your work.	57.1	14.3	28.6
Evaluate electronic portfolio products.	42.9	14.3	42.9
Create technology tools to assess student work (e.g., checklists, timelines, rubrics).	0.0	28.6	71.4

#### Dimension Summary

<b>#</b>	<b>Dimension</b>	<b>2007 - 2008</b>
1	Advanced Skills	2.19
2	Computer Basics	2.92
3	Internet Basics	2.77
4	Multimedia Basics	2.39
5	Software Basics	2.88
6	Using Technology for Learning	2.46
7	<b>OVERALL</b>	2.60

Number of Respondents

7

## **Conclusions**

The conclusions of the present study are presented in association with each of the MCSL program goals in the following section.

### **GOAL 1**

***What differences emerged in teaching strategies used during computer-supported lessons versus conventional lessons represented by the national norms?***

The results reveal that MCSL students had greater advantages than comparative norm group students to develop 21<sup>st</sup> Century knowledge and skills and equal to or enhanced advantages for increased learning and achievement. Although the significance of these results were inhibited by the small sample size, observations showed that MCSL students engaged in meaningful computer activities that required the use of 21<sup>st</sup> Century skills more than comparison students. Teachers more often supported student learning with coaching and facilitation and evaluated student learning through the use of performance assessments. Similarly, MCSL vs. comparison teachers had higher agreement that use of technology had a positive impact on student learning and achievement. MCSL teachers were adequately prepared to implement technology integration lessons that were significantly more student-centered, used technology as a learning tool, and were more meaningful than comparison teachers.

### **GOAL 2**

***To what degree does the laptop program support higher-order teaching and learning (e.g., problem solving, critical thinking, inquiry)?***

It is clearly evident that the McNairy County Schools Laptop program has reduced the gap in educational opportunities by providing approximately 150 laptop computers to students in 5 McNairy County schools. The positive impact of this initiative is reflected in data from over 373 MCSL students who reported that using laptop computers increased their research skills, made schoolwork easier, made them learn more, and helped them do better on tests. The MCSL initiative also had a positive impact on teachers in the program, who, as compared to the norms, reported a significantly greater readiness to integrate technology into their teaching and greater belief that effective use of technology can enhance teaching and learning. Additional evidence of greater educational opportunity was revealed when examining data from random visits to 5 MCSL classrooms. For example, computer activities in MCSL lessons were significantly more meaningful and MCSL students more frequently used the laptops as learning tools. Collectively, these data present triangulated evidence that the 2007-2008 MCSL program implementation did support higher order teaching and learning through ubiquitous access to technology.

### **GOAL 3**

***To what degree does the laptop program increase students' confidence and perceptions regarding skills in using technology to further their education and preparation for contemporary careers?***

It is evident MCSL students have increased confidence regarding their ability to use and benefit from laptop computer usage. Students reported laptops made them better researchers, improved their ability to get a job in the future, and made them better computer users, all critical elements to finding and keeping a job in an increasingly technological society. MCSL students demonstrated abilities to work collaboratively and in small groups well with technology, with a high preference for using presentation applications for sharing information with their teachers and peers. Teachers reported with high agreement that students were technologically capable, and that the use of computers has increased the amount and quality of interactions between students, as well as the quality of the work from students.

### **GOAL 4**

***How do students perceive the use and access of laptop computers?***

Collectively, the evaluation evidence suggests that the MCSL program enabled and supported participating students to perceive the use and access to laptop computers positively. The most obvious change was the introduction of one-to-one wireless learning environments in 5 schools. Yet, more important were the changed instructional practices that engaged students in more hands-on, research-based activities that required use of the Internet and research software more often than typical classrooms represented by the comparison norms, and the decrease in the low level use of laptop computers with students. Innovative applications of laptop use were implemented with MCSL students who reported significantly higher agreement than comparison students that they were able to use technology in meaningful ways and believed laptop technology benefited their learning in a variety of ways.

### **GOAL 5**

***What do teachers perceive as the benefits and problems of integrating technology in laptop classrooms?***

Teachers reported with high agreement that students in the MCSL Program were technologically capable, and that the use of computers has increased the amount and quality of interactions between students. Teachers also reported that quality of student work was improved by access to laptops, and the integration of laptops has positively impacted student learning and achievement. Teachers also reported their lessons are more student centered and interactive with the use of laptops. Comparatively, teachers report that there is room for improvement when it comes to other teachers supporting the laptop program at their school, and the need for additional improvement in the development of plans for the

use of laptop technology and professional development activities to derive the greatest benefits of this technological resource for their students.

## **Summary**

In a one-year period, MCSL made great strides toward achieving the overall program goal of improving student learning and achievement through the integration of 21<sup>st</sup> Century technology tools into instruction. First, the MCSL program successfully infused approximately 150 laptop computers into McNairy County Schools' junior high schools to create one-to-one learning environments. Second, MCSL teachers were adequately prepared to implement technology integration lessons that were significantly more student-centered, used technology as a learning tool, and were more meaningful than comparison teachers. Third, MCSL vs. comparison teachers had greater technological confidence and belief in the learning benefits of effective integration practices. And, finally, MCSL students self-reported high frequencies of using 21<sup>st</sup> Century skills for Internet, word processing, and presentation activities in their classroom settings. Thus, with continued engagement in one-to-one learning, MCSL students have a greater potential to be better prepared for future careers.

It is evident that the McNairy County Schools Laptop program has been a catalyst for innovative technology applications that have yielded improved educational opportunities for McNairy County's students. It is also evident that small-scale implementation of this program has inhibited interpretation of most of these results as being statistically significant and therefore may not necessarily be generalized to a larger population at MCS.

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## Appendix A: Teacher Comments on Teacher Technology Questionnaire

<b>What are you most excited about when successful student use of laptops occurs?</b>
I am most excited about the fact that students are able to use laptops to connect past events with their current lives.
I love to see their eyes light up when they grasp a concept that is difficult for them to understand in the standard classroom setting.
I see all students produce a quality product using different methods to get to the same result. The laptop allows each student to assimilate the learned information and use it in a meaningful way that they create.
I'm excited to watch the students interact with each other. They willingly help each other find materials, problem solve software problems/mishaps together, and collaborate. I noticed that many times the students cross their social boundaries to help one another. When there is a problem, rarely is someone overlooked because they don't fall into a certain clique. I feel this is a very positive aspect of the laptops.
The one thing I am most excited about is when I can see that real learning took place, not only in the area of content but improvement in technology as well.

<b>How have student attitudes towards classroom use of laptops changed since the beginning of the program?</b>
In the beginning the students viewed the computers as something they were going to get on to play games. After a year of completing many assignments they see it as a tool for learning.
The computers have lost the "cool factor" and have become as common as pencil and paper.
The laptops are no longer a 'toy' or game machine. It is viewed as common as notebook paper that is needed to perform in the class. It is a tool.
The students are so excited to learn and want to use the laptops daily.
The students have been very excited and motivated about using the laptops.

<b>What is your greatest success with regard to the One-to-One laptop program?</b>
Getting the students excited about learning history.
I feel my greatest success has been in the ability to vary my teaching to make the curriculum more interesting and engaging for all students. Using the laptops, all students regardless of ability level has been able to gain some knowledge of the subject matter in a way that it is able to be recalled at a later time. Even the most unappealing and dry topics can become interesting with integrating laptops.
I feel that my greatest success is that the laptop program has given me the opportunity to assess each student based on his/her level of ability.
I think that student involvement has increased.
The greatest success is that the special needs students seem to be able to do the assignments too!

<b>What have been the biggest disappointments with regard to the One-to-One laptop program?</b>
At the beginning, I was a little frustrated that some of the students lacked basic computer skills.
I feel like there is a lack of support from the county level.
I still have not gotten the balance of content coverage with integration of the computer. Time management is the biggest problem. I have so many content objectives that would only take a few minutes to cover and many times assignments are carried on longer than I plan for students to complete the assignment.
The biggest disappointment has been the lack of support throughout the county. Parent and community leaders who are DIRECTLY involved with the program support us, but others do not see the importance of the program or how it can improve our students and their learning. We have been denied funding because of individuals who lack the initiative to propel our schools to greatness. Also, there are many teachers within the district who do not support what we are doing. This is very discouraging.
The lack of interest from other teachers and community support. For many it is still not viewed as a way to invigorate students about the curriculum.

<b>In what ways can the One-to-One laptop program be improved?</b>
I think the program should be expanded into the high school. Our students are leaving Jr. High with real world technology skills and are accustomed to producing real world examples of their work. Then they enter high school and use a bare minimum if any of their skills and are regulated to book work.
I wish the program was available to all grades.
More community support and awareness.
This program can be improved by expanding the number of classrooms that have the laptops for teachers who are WILLING to take this chance and risk breaking out of the norm.

*Note: Comments are generally reported verbatim. Selective editing may occur, especially when comments are transcribed from paper-based instruments. The term "sic" may be inserted during the transcription process when comments contain incorrect spelling and/or grammar or where the meaning is unclear.*

**Appendix B: Responses of Other Types of Software Used Question from Student Technology Questionnaire**

If you indicated Other type of software used please list the name.
alot more power ponit
alot of tings
AR Student
ask.com
because u can get more imformation on the internet and have fun using the labtops
Because we get to do powerpoints on the computers.
dictionary
Discovery Channel and History Channel
Discovery channel
Don't remember
exil spreadsheet
flash drive
Flash Drives
games
games on the internet that are for learning and not for fun
Google [4]
Google ask
google earth
hard drive
i do nnt no any
i don't know
I learn a lot of things faster and easer a lot better
i would go to like walmart.com
im not
Insiration 8 [3]
Internet4classrooms.com
It is fun and we learn a whole lot
It isn't really a software but we use it to get on math stuff and facts about math!!!!
jump drive
junk drives
learning how much taxes are paid in every second.
Learning new things
making slides
marcersoftware
math
math games
micorsoft word
microsoft publisher
Microsoft Office Publisher

If you indicated Other type of software used please list the name.
Microsoft Publisher
Microsoft Word
Microsoft word, Paint
mozilla firefox
mp3player
Paint
Powerpoint [2]
pppst.com
publisher
removable e disc
removeable disc
research
S.S
shortcut to grammer workbook
some powerpoints that other people made, and we would look at it to get an idea for a powerpoint.
Sometimes we write about thing that we do or what happens.
Sometimes, and if we are very good we get to play games.
Surveys and searches
takingtests
The Powerpoint and i dont what the others are.
thinklink learning [2]
to do extra credit work and do power points on the computer
United Streaming so we can watch learning videos.
we go to other game sites so we can practice our states in some games
we learn about life style
We learn about flips,turns,rotations and how to live life.
We some times get to go on the internet and get on any thing that is social studies or history, and we also get to practice our typing skills when we are done with our work!
word serches
Working on projects.
www.funbrain.com
www.poptropica.com
www.ask.com
www.askforkids.com
www.mcnaury.com
www.internet4classrooms.com
www.poptropica.com
You a bunch with this Labtop!
You get to play a lot of educational games!!!

## Appendix C

### Responses about the Best Thing about Using Laptops Question from Student Technology Questionnaire

What is the best thing about using laptop computers in class?
about learning new things
because boks and paper gets boring and using laptops you are always working.
because you can get more info on the internet and it has improved my skills at typing power points.
because you get to type and get to get on other.
Being able to use computers to search for answers, definitions, and pictures.
brochures in my book are fun for me.
class is not so boring cause there fun
Doing powerpoints and typing
doing math activities
doing power points
Doing power points in class with all of them.
Doing powerpoints.
Doing the power point. And other things.
doing work
easier and very fun.
everything we do
Everything.
for school work.
fun
fun and its easier
Games
games inspiration8 software
get to look up stuff.
get to make powerpoints and u get to type not write
Getting on other websites!
getting on the internet
getting on the powerpoints
Getting online.
getting to learn and have fun
getting to learn more about things that your going to use for your life.
getting done faster because the internet is fast and i get the information i need fast
Getting to do fun projects
Getting to have fun and learn.
Getting to learn more than what is in a text book.
Getting to learn with them.
Getting to use them instead of the textbooks.
giting to playmath games
going on internet

What is the best thing about using laptop computers in class?
having the world at my fingers.
Helps us learn easier.
home woke
How much easier it is to learn .
How you can look up something if you have a project in classes with a partner.
I always get my work done and I love it very much because my grades have improved.
I believe that the best thing about the laptops is the fact that we do many class projects.
i can domy work on the computers then doing it on paper
i can learn to type better and is better.
I can learn where to find things faster
I can understand the laptops more than I can a science book.
i dont have to write write alot
I get to learn a lot more and it will stick in my head
I get to learn at my own hands!
i get to learn more
I learn alot from it.
I learn better and it is more fun.
I learn better with laptops and concentrate on my work more. I want them next year. They are awesome.
I learn more about everything and I hope to use them next year.
I learn more when I use the laptop in my class and it makes math or in any other class!!!
I like being able to research and use different resources to be able to make my answeres more descriptive and elaborate. I also like using microsoft word because of the spell-check :).
i like it because i have always liked to type and its fun to learn on it and work on power points is my favorite
I like it because you can search it up, and then go over the answer on the webpage.
I like to play out side!
i love it !!!!!
i love the labtops because of the fun stuff we do on them.and now i no how to type without looking because of them so thats why i love them.
I love tiping.
I think that it helps me to learn more.
I think the best thing is using the computer is to do education stuff like brainpop, internet4classrooms, and j lab.
I think using laptop is great becuse if you do't no a word mean you can go to google a seach it .
i understand stuff easyer
I'm getting better at typing from using laptops.
idk
if we get to use the power point or something we can decoate it
instead of writing our work we can type it.
It always makes learning so much more fun. I usually never want to leave math class , because I'm having so much fun on the labtops.
It better than schoolwork and it help you learn even better.
It checks your spelling.
It has impoved my typing skills more than I would have ever thought that it would, and it will help me get a better job in the future.Also it has made me want to learn more than I ever would have without the laptops.
it help up get our work done.so more people get done.
it helps me be interested in school work

What is the best thing about using laptop computers in class?
It helps me because now i no more about it.
it helps me do better in math.
It helps me do my work and get better grades.
It helps me learn and understand more. It is fun because we get to do fun things on the laptops.
It helps me learn better. I really liked using computers.
It helps me understand the subject we are talking about better. And it makes school work fun.
it helps me understand things because it gives me specific answers
It helps me understand things better.
It helps me understand things more clearly.
It helps us all learn more and it also helps when we need a better grade.
it helps us know what tto expect in technology because some jobs you have to use to computer to work.
it helps us with educatinal games...and learn different things
it helps with your typing and you can learn more
It helps you learn more about computers.
it helps you learn more and faster.
It is a lot easier to finid things on the computers.
It is better than writing and it also teaches us about a labtop.
It is easier doing work since I can type my work, and I can look up answers by using he internet.
It is easier for me to do my work and it maukes it neater. Research is easier.
It is easier than having to look it up and alot faster and funnier!
It is easier than using a book.
It is easier to do my work.
it is easier to do work
it is easier to keep fococused n
It is easier to search with.
it is easirer to type
it is easy
it is easy to learn more about math, it is easy to learn alot
it is easyier and you get more of todays information
It is esier to lean
it is fun
it is fun and eduacational
It is fun and we learn alot.
it is fun getting to learn with them
It is fun to use them because you are learning in a fun way.
It is fun.
It is so much easier when we use he lap tops.It is so much faster when we do our work on the laptops.
it is very fun and educational
It is very fun and you learn about the same with a computer.
It is very FUN.
It lets us have more fun @ get to work with other students more in this class more than in the others.
it looks beter

What is the best thing about using laptop computers in class?
It makes doing work in class fun.
it makes it easier on us!!!!!!
It makes it easier to do work.
it makes it easier to listen to whoever is teaching
It makes it easier to look up things you need to know.
it makes it easier with a laptop!
It makes learning a lot easier. Plus more exciting.
it makes learning fun
It makes learning fun and easier.
It makes learning fun.
it makes learning more fun
It makes learning more interesting.
It makes things easier
it makes work easier
it makes you think more about the work you do
it makes you want to learn more.
It makes your work easier to do and it also looks neater. Using laptops is fun and sometimes you learn more. I have learned a lot over the year thanks to our laptops.
It provides an easier and faster way of retrieving information.
It really makes me feel like I can learn more from this because you have such a wide variety of research that you can use, but it's up to you to decide which information is reliable. In text books it's limited.
It saves my hands the trouble of getting cramped up a lot from an uncomfortable position
it showed us how to do almost everything we learned doing slides
It stands out to help me think and understand more.
it's easier to learn and it is funner than working out of a book
it's easier to get more information about something and it's fun.
it's easier
it's fun you enjoy it a lot more.
it's a pain in the butt
It's Easier
It's fun
it's fun and you still learn about the subject and computer skills.
It's more fun and interesting than normal work.
learn more in a fun way
learning
learning about math
Learning is funner.
Learning more stuff to get better at it.
Learning new things.
less time in the books
less writing
looking up stuff
looking on the internet

What is the best thing about using laptop computers in class?
looking up thing
looking up words, and powerpoints
Making power points.
Making projects
more acces to the internet
mostly powerpoints I have to say there awful fun.
My compter skills and my work has improved.
Not as much home work.
Nothing
our hand do not get sore from writting
people get to youse sherch enjens.
play games
playing games
playing games, and using it to do projects in.
power point
power point and inspiration
power points
powerpoint
powerpoint and not having to write
PowerPoints.
projects like power points, and reports.
serching stuff helped my learn more about.
sercing things and making biographys.
So when we get older we'll know how to do this kind of stuff.
Studying plants, and animals on google.
taking testes
that i can type alot faster
That I have fun learning and want to lean more and wish math was all I ever went to , its fun!!
that its funner than the other classes
that we get to look up people we have never heard of
That we learned more math stuff along with learning how to use laptops. My grammar has really improved since started using the laptops!
that you do fun actvies like learning games
that you dont have to write
The best that about using a laptop is looking something up for a test.
The best thing about using the Laptops would be making the stories! They are usally very interesting and we do them about learning but, the come out to be so funny!
The best thing about lapops is that we get on PowerPoint. It is fun!
the best thing about the laptops are that they help me and i love thim.
The best thing about using our laptops is that we get to experience working with a tool that we may be required to use in future life. It also can effect the grades we get by pointing out simple mistakes
The Best Thing About Using The Labtops is When We Learn On Them.
The best thing about using the laptops was the educial sites on the internet
The best thing is doing a powerpoint on matter we got to teach for a day.



What is the best thing about using laptop computers in class?
The best thing would probably have to be the projects.
the game of life (present ,reports,ect.)
the laptops are ease now because we heve now how to yous them.
The laptops make youwant to learn more and they make education fun.
the power points
the typing
The wish list when we looked up stuff and copied it and pasted it to the list and then added all the prices and the tax
the work is easier and more fun
there cool
they are awsome to work with . there easy to opperate
they are easier
They are easy to use.
they are fast.
They are fun and educational. I think you find out more.
they are fun to use and they are helping me learn to type faster.
They are fun to use.
They are fun to work on and it makes work easier.
They explane things better.
They get you more interested in our work
THEY HELP ALOT
They help me get more imforemation on my work, and the laptop had hepled me improve, and I get it finised quicker than my other laptopless classes.
they helpus learn
They make learnng more fun. I have really enjoyed them.
they show you more than a book and tell you more stuff
tipping
To do powerpoints on.
To go to Thinklink and take the test or quiz
To help find more information about certain types of stuff.
To look up stuff.
typing
u get to learn to work with them and learn new stuff that is not in the text book.
U learn and get 2 have fun at the sme time.
we actually get to go to to the sites he is talking about and following along!
We can get our work done faster.
We can look up our answers and we have a wider variety to choose from.
We can us google.
We do not have to use oru text books that much anymore.
we do not have to use our books.
we don't have to use paper and pencil
We don't have to write on so much paper and we can save the trees!!!!!!!!!
we dont have to use books
we dont have to work out of a book!!!!

What is the best thing about using laptop computers in class?
we get on the internet and we look stuff up.
We get things done faster, and its fun to use the programs on the laptop, and to type.
We get to do activtys on the labtops like we did this teaching project and you had to act like theh teacher it was so fun!! I would like to have them next year too!
We get to do alot of powerpoints.
We get to do more activities that help us learn more about it.
We get to do powerpoints and do research on the internet explorer.
We get to do powerpoints, we also get to do research in class and we also get to do projects that we didn't get to do last year. We also got to do insperation 8. The best thing that I've got to do is the powerpoints. i have never got to do a powerpoint. This is my 1st year and it was so funb to work on the computers.
we get to do reseach on them
we get to get on the laptops almost evrey day
we get to learn about people who we never heard of
we get to learn the technology
We get to learn the technology.
we get to play games
we get to play some math games.
we get to take test and do power points. we really do like them because if I dont know how to say or spell a word it shows me. thats why Like it.
We get to work on our typing as we research about the subject we are learning about.
We get to work with people and we have savenger hunt on a web site that is educational.
We have fun and learn new things about the computers and how to use them.
we laern more
We learn more
We learn more about computers and it is easyer to do work.
We learn more about stuff by reaching it.
We learn more by ladtops then we would by a teacher teaching an have fun.
we learning the key
we sometimes get to play games mostly schoolwork on the labtops
Well it helps me in my typing skills. It alsoHelps me in my creativity.
well, to me and alot of my friends it makes my life in lauage arts a whole lot easier and a whole lot more fun.
Well, it helped me doing my work because we dont have our work we dont have time on the computer.
When we do a story
when we get through with our work we get to play games
when we got to do our powerpoint
When we got to teach a class. We got to do a power point. And it was so fun! We also can type a lot better now after we have worked on them. I hope we have them next year!
when we have free tim
when we made our power piont
when we play games
when you do projects
When you get done with all your work you can get on a few games.
yes
you have fun and you learn a the same time.
You can acoplsh so much more on a comupter than on paper. EX. On MS. word it has spell check so it will save me the troble of walking to the teacher and asking her and walking back.

What is the best thing about using laptop computers in class?
you can do a lot lake brinpop
You can do more things like powerpoints with looking up research it helps me with learning more words!
You can do research on a qeuston.
you can find anything on the weblany possible thing you want to know can be found.
You can find the answer easier and better and it is more likely to remember.
You can learn a lot more when you use laptops.
you can learn more
you can learn more when your using laptop coputers in mathmatics.
you can play educational games... and learn while you are having fun.
you can play games look up stuff and fun stuff
You can practice your typing skills and if you are doing a project you can look up things easy for it.
You can sometimes use the computer to help find answers.
You can understand more and it's better then pencial and paper because if you run out of them then you would have to go buy some more, but if you have the laptop then you don't have to.
you can understand more things about what you have to do and were you can find it, it makes it easyer on us students when the teacher is helping others
You can understand what the teacher is talking about because you can see what it looks like.
you can use laptop for reserch for homework
You do alot of stuff together, and it makes it easier to learn new stuff.
you do not get homework sometimes
you do not waste any paper
You don't have to right.
You don't have to use paper which means you're saving trees.
you don't have to wright.
You don't have to write.
you don't use led alot
you dont have to work as hard
you dont have to write that much.
You get a better experince in the subject you are learning in.
you get to do it with your freinds
YOU GET TO DO WORK AND LOOKING UP STUFF.
You get to experience the technology and just more likley to have a bett job when I get older.
You get to find different things.Looking at the weather site.You get to do power points.
You get to go online and look up interesting stuff.
You get to have fun while doing work.
you get to learn in a fun way because your hands do not heart and, you dont have to write you get to type.
you get to learn more about the subject and you look forward to see if you get to us the laptops. And you team up and do other things about the internet and the stuff that is on the computer.
you get to learn more about what you are studing.
You get to learn more whit them.
You get to learn more,and have fun learning.
you get to learn on them
You get to look up whatever you are learning about.
you get to play games and do projects

What is the best thing about using laptop computers in class?
You get to play games and learn so ya that is fun!!!!!!!!!!!!
you get to play games on laptops
you get to search things on the internet
You get to type besides write it out.....
You get to work in groups.
you get to work independent more often.
you get your work done faster and it is easier then writing by hand.
You have a great look up tool.
You learn A LOT with laptops.
You learn alot more than with a textbook.
You learn better computer skills during class.
you learn how to type better
you learn more
You learn more about math using laptops because people don't wan't to do nothing without laptops.
You learn more about what you are supposed to be doing.
You learn more and learning seems more fun than when you do it on paper and computar help me get better grades.
You learn more in a different way.
you learn more stuff and it fun
you learn new things every time.
you lem more
you lem more things
you tip
you understand a lot more beacuse, you have it easier in stead of haveing to look it up page by page.
Your on the coputer. and free days. Also anything is better than pencil and paper!!!

## Appendix D

### Responses about the Hardest Part about Using Laptops Question from Student Technology Questionnaire

What is the hardest part about using laptop computers in class?
"Roadblocks"...when there is a problem with a computer or a program.
about nothing
at fist it was hard now i can work better
Be respectfull
Big groups.
creating powerpoints
cross wor
cutting and pasting material
Division.
Doing a powerpoint.
Doing a report
doing it on your own
Doing something on it i've never done before.
Don't Know
English
Errors or problems that occur during an assignment.
Everything.
Figuring out how to make things make sience.
Figuring out some of the controls.
Finding a website.
finding all the keys
Finding all the keys and where they are!
finding info on the solar system
Finding research for a power point.
finding sites
finding stuff
finding the correct resources
Firging out new things.
flat mouse
following directions
geting information from one flash drive and puting it on another one.
getting the buttons down
getting information on the internet
having time to get things done
having to deal with math
Having to do a power point
having to look up a lot of reseach about people we have ever heard of.
Having to make tables and input output diagrams(exp.Venn Diagram)
Having to type evreything,,,,,,,,,I'm a bad typer

What is the hardest part about using laptop computers in class?
i do not tipe very fast
I don't know.
I don't think it is hard at all.
I don't think that there is a hard part when useing laptops.
I don't understand some controls.
i dont have one
i dont think i have troubles
I love using the computer, so there isn't any hard stuff to do.
I think it is learning new things about the labtop.
i think it would be using the internet and looking for information because i am not the best on the computer.
I think nothing is hard.
I've never come across something that was hard that I didn't learn about.
if they're not working right
if wetry doing the oppisite of the teacher
If you are researching a certain topic on the internet, sometimes it doesn't come up with the right thing.
insparation
inspiration 8
Is when it messes up and it wont do anything.
it being right in front of you and not being abe to touch it
it gets confusing
it is all very easy with training from the teachers!!!!
it is frustrating
It is knowing where to go on it and the typing at first it is hard but after a time period it gets easier.
it is not hard at all
it is not hard to me at all.
it isn't really that hard.
it isn't!
It makes you have to wait longer to start projects and reports.
It really makes things easier, only occasionally it is hard.
It takes a while to do a new project , because we are just learning how do that on the computer.
It was hard to get around it. [until now]
It would probably be tring to find things and you can't find it.
it's easy
It's easy.
It's hard to find what you need for the powerpoints.
It's hard to type somethind then save it because you have to save it to the meomory card.
It's not really that hard.
Learing a new program. The first time we learned Inspiration I thought it was really hard. Now I am a pro.
Learing all of the stuff to do.
learning all the keys
learning how to do everthing in Microsoft
Learning how to operate the computers.

What is the hardest part about using laptop computers in class?
Learning how to type.
Learning how to use it is the hardest part.
learning how to use the keys
learning new stouf
learning new things about them and following directions because we don't know how to do it but with my great teacher...he helps us get through
Learning new things that we have never heard about.
learning the keybord
learning the keys without looking.
learning to type
learning to use the keys
looking and tring to find the stuff that she wants us to get
looking for certain websites
looking for hard things
Looking for reely old imformashen.
looking for stuff u have never look for
Looking for stuff you never knew about and trying to figure out what to do.
looking for things
Looking SOME things up.
looking up information on the internet
looking up items
looking up stuff
Looking up stuff.
looking up th right thing it sometimes takes me a while to find something
Looking up thing.
looking up things
making a presentation
math
Most deffinently my typing.
Moving them.
nethier
never
never slam it down dont press the button if you are not aloud to.
non
non because they are easy to use.
none
not being able to find a site
not being able too have a snack at your desk.
not knowing things about them
Not knowing what to do.
not knowing what you are doing and messing up on something!
Not knowing where thing are for an example power point.

What is the hardest part about using laptop computers in class?
Not really anything. If anything copying thing on to the hard drive
Not wanting to get off the laptops and wanting the class to come quicker so I can get on the laptops.
nothin.
nothing
nothing .
nothing at all because people in this classroom help you and the teacher.
nothing because the laptops help me get the imforemation I need.
Nothing because when you do it is a lot easier.
Nothing is ever hard with the laptops.
nothing is hard
nothing is hard about it
nothing is hard about using laptop computers.
nothing is hard about using laptops in class.
Nothing is hard on the laptops really.It is all possible.
Nothing is hard over the year.
Nothing is hard when you use computers.
Nothing now
nothing really
Nothing really because, it is easier and faster.
Nothing really because, we have worked on them a lot. Now it is not really hard any more.
Nothing really it's just fun and easy.
Nothing really, maybe some people get confused on Publisher, but nonetheless, it is all pretty easy!
nothing really.
Nothing!
nothing!!!!!!!!!!!!!!11
nothing.
Nothing. Everything is easy.
nothing....
nothing..its fun and learning!the laptops make people want to learn.
noting
nuthing
One time we were doing a powerpoint and the next day we looked at our flashdrives and everyrthing was gone. The project was due like the next week and we had no information. We had to start all over it was terrible. i would say the hardest thing was the roadblocks and headaches.
power point
power points.
Powerpoint
probably when we do a scavenger hunt on the enternet
RARELY ANY THING
really not anything
Really nothing except not knowing what to do like we had to create a booklet for another class we had to make a school map and it was hard because we didn't know how to do it.
really nothing.



What is the hardest part about using laptop computers in class?
Research
researching
researching some stuff but most is easy.
scens we got laptop it made it eaier to do my work .
seachering for things that have alot of diffrent meanings
searching
Searching for stuff thats hard to look up.
searching something that you are tryingto learn about when you don't know where to find it.
Searching stuff on the web.
Searching stuff.
some lessons
Some of the software is complicated to use.
some people always get mixed up if they should get on the computer or not.
some times get the wrong information.
some times when we must have to do research projects i dont like those at all!!
Some times you may not understand what to do.
sometimes confusing
sometimes finding pictures for powerpoints, but not a whole lot
Sometimes it can get a little confusing with all the different oppinions but it's really not that hard.
sometimes it is hard for me to do the grammer handbook.
Sometimes it takes us longer for everybody to get going.
sometimes it while freeze up
Sometimes research isn't the easiest, But when you have such a great, amazing teacher like Mrs.Kirkman its hard!
Sometimes typeingg in the right address.
sometimes u can get the wrong information off the internet.
sometimes understanding it.
sometimes using the laptop.
Sometimes you mess up like if you are doing a story and you have to go and correct it.
somtimes it doesn't let you play the website you would like to
Somtimes when you type what your looking for does not come up all the time.
spelling
spelling.
TEMPTATION!!! Instead of doing your work you wont on the laptop and you dont wont to do your work.
that we had to do a actvites on the deck
that you have to have good typing
The hardest and the easiest part at the same time is that on the internet there is so much information it may take quite a bit of time to find what you are looking for.
The hardest part I think is when the computers are slow and it will take you an hour to get on a website.
the hardest thing about laptops is that you have to be easy with thim.
The hardest thing about using a laptop this was learning to use the flash-drives
The Hardest Thing Is When We Do The Thinklinks And Division.
the math

What is the hardest part about using laptop computers in class?
The only bad thing about having our laptops are some of the time we lose while trying to work around the roadblocks. But you can experience that with anything.
the power points
THE TEST.
the typing
The typing but it has helped me alot with the laptops.
The typings.
Their isn't a hard part.
their not really any thing thats hard all you have to do is follow directions.
ther real nothing hard about useing laptops.....
there ain't none
There are still some thing that I do not know.
There is know more things to do we have already done everything.
there is no hard part
there is not a hard part
there is not muchhare thing on th ecomputers
there is nothing hard relly
There is nothing that hard.
There is nothing that is hard to do about the laptops.
There is noting hard about it.
There is really nothing hard about it , but if I had to choose one hard thing it would be powerpoint.
There is really nothing hard about it.
There not anything hard
There really isn't a hard part about the laptops.
there really isn't a hard part but when we learn new things it might be unclear but when we do understand it is fun
There really isn't anything about using the computers that is to hard, but if I had to choose it would be that it takes up a lot of space and if the teacher decides to make us to text book work space is limited.
There really isn't anything hard about using them in class.
There's not really any hard parts.
they sometimes don't work.
They sometimes messup and we have to get the teacher to help us figure it out.
tiping
to reset it
touch pad
Tring to find somethings on the internet.
tring to lean new stuff
trying to find the website.
trying to find stuf
trying to find the right page to go to
trying to spell it right.
typing
typing fast
Typing in the adresses

What is the hardest part about using laptop computers in class?
Typing in the right websites, usernames, passwords, and stuff like that.
Typing real fast for me cause I don't type that fast.
typing the words
typing with out looking
typing without looking and it takes it a while
Typing.
Umm probally having to learn all the things you can do on a computer and having to remember them and how to do it.
using it with other people
Using the mouse.
Using the power point
Waiting for others to catch up with the students who are a little ahead.
wanting to get on e-mail
we always get mixed up with eathier to getting on or not!
We can always have problems when doing new things.
We don't always know how to use it.
what to do
when ever you mess up on your spelling because i want to show that i learned something.
when it is something very hard.
When m computers locks up.
when sometimes the internet is down.
When the weather is not very good, the laptops sometimes dont work.
When there is a roadblock it slows everybody down.
when they freeze
When u don't have a clue how 2 do somethng.
when we do test
When we don't know what to do with a project but our teacher helps us out if we don't know what to do.
when we had to figre our budget
When we have to find different things on google.
when we have to work on a hard project and you cant find any of the answers
when you have to look up stuff.
When you are reasherching something.
When you can't find what you're looking for.
when you do like a power point and some things don't turn out the way you planned.
when you dont get it
when you dont know how to do something
When you get off track it's hard to catch up.
When You Get Stuck.
when you have soming wrong it is hard to get past it
When you have to do like power points.
when you have to find a car or house
when you have to learn not to look down
When you mess up on a Internet address and it takes a really long time to get it EXACTLY right.

What is the hardest part about using laptop computers in class?
when you mess up typing./ (like that)
when you need something but you can't find what you need on the internet
when you've got other subjects in school ,becuse you'r using the labtops and suddenly the bell rings and you have to hunt for a pencil and a peice of paper.
win it frieses
word doc.
Writing something on the laptops.
You can't eat or drink around the laptops.
You don't always find what your looking for on the computers.
You get so many road blocks.
You got to know whatt you are doing at all time.
You have to be careful when you move so you won't break them.
you have to have good typing
You have to look up stuff when you have never looked up stuff
you have to remeber were the keys
you have to type alot
You have to work alone.
you look up some stuff
You may not know how to use things like powerpoints, or a spreadsheet.
You relly have think
You sometimes can't find what your looking for.
You sometimes don't understand how to do the complicated programs.



<b>If you could change anything about using laptop computers in class, what would you change?</b>
I personally would like it if all the class used labtops!
i think its all perfect.
I wish I could use the laptops in every class
I wish we could have laptops in every class.
I would change nothing because, I love the way it is.
I would change how our teacher can control all of our laptops from his computer.
I would change how we use them in class were so that we could use them more than we do.
I would change it to be beside friends and helping me when i need him/her
i would change it touch sceen.
I would change nothing.
i would change of win we get to play games
I would change some of the activities.
I would change the bac grounds.
I would change us so we would not have to find things on google.
i would change using them so often as we do
I would chose to use them in more of my classes.
i would do 15 min. of paper writing and 30 min. on the labtop lesson.
I would have laptops in every class I have
I would let games b played more frequently.
i would let us get on games like www.webkinz.com!
I would let us get on www.webkinz.com because we can't ever get to.
I would like to be able o bring a disc home to put into my personal computer so i can be more creative and take more time on my assignment.
i would like to do more things on the computers
i would like to have them in all classes i think i would really help!
I would make sure we use the computars more and make sure we use them in every class.
I would not change any thing about the usage of labtops.I really enjoy working on them.
i would not change anything
I would not change anything because I like the way it is now.
I would not change anything.
I would not change Eney thing
I would not change nothing about these laptops because I love having them in my class room and I hope that We have them next year!!!!!!
i would say u should be able to check your hotmail
i would take eductional games and keep them that way but i would make them a little funner.
i would to play fun games sometimes more ofthen
I would use them more often.
I would want more educational games to learn about multiplying and fractions.
I would want to change the time we get to spend on them. We get to spend about maybe 3 times a week. That would be all I would change.
I would want us to type on microsoft word more.
I would'nt change anything
i would'nt change anything.
I wouldn't chang anything, because i like everything just the way it is now.
I wouldn't change a thing.

If you could change anything about using laptop computers in class, what would you change?
I wouldn't change any thing
I Wouldn't Change Any Thing About Them Cause I Like How They Are.
I wouldn't change anything about the laptop classroom because I think it is a joy to have them.
I wouldn't change anything.
i wouldnt change it
If I could change anything about the laptops it would be to have a free software that contained games but still held educational quality.
If we could change the background.
if we could play games everyday.
If we wanted then we could work with a partner.
it is cool
It would be powerpoint.
less blockers
Let you play more games
Letting the students work with the laptops more. Getting more free time on the laptops to play games @listen to music.
Listening to music.
Looking stuff up.
make a better power point system
Make it go faster.
make the laptops a differnt color besides that theirs nothing elsi
making math games
Maybe some blocked websites to search up more answers.
more free time and less time having to work!!!
more free time o computers
More fun games.
more game
more game time
More game time.
more games
more lessons
more power point and inspiration
More time to play games.
More time to work on them ,and longer time to learn about them.
more work
More work on the computer.
No
no!!!!!!!!!!!!!!!!!!!!!!
non
none
not a thing.
not a thing.
Not having to have cords hooked to the computer.
not having to use the keys

If you could change anything about using laptop computers in class, what would you change?
not really anything, I really enjoy them.
not to type that much.
nothin it perfect
nothin.
nothing
Nothing at all I love the laptops!
Nothing because it is fun.
Nothing because it is so fun.
Nothing but I would like to get to use computers in all my classes.
nothing caues i love this computer the way it is
Nothing I an very satisfied
Nothing I like it all.
nothing i like it just the way it is
nothing it is fun to have laptops
nothing it's perfect the way it is
Nothing really I love everything about the laptops.
Nothing realy i like how it is already.
nothing the laptops make it fun and easy to learn and remember and you can find every thing i am happy that we have learned and got new laptops this year
Nothing they are great.
Nothing!
NOTHING!!!! Not one single thing!
Nothing, I like everything.
Nothing, I like them the way they are. Not anything at all!!!
Nothing, I love everything about it so there is really nothing to change
Nothing, its all fun,all the time!!!!!!
Nothing, the laptops are perfect.
Nothing,the laptops are perfectly fine
Nothing.
Nothing.Everything I do on the laptops is really fun.
nothng
nothing
Nothing really they are perfect
noting
Noting.
nuthing
Play games some times.
play games sometimes
play no it more
play on anything.
playing games
Probably nothing I think it is perfect the way it is.
Probably, to do more reports and powerpoints.



If you could change anything about using laptop computers in class, what would you change?
put less things on their
put test on it & not on page
Put them in all classes.
realey nothing
reseach
So that we could play more games!
software
start getting on funthings
studyisland
technology
that we are aloud on our e-mail
that we could have access to the labtops in all the classes
that we could more powerpoints
that we could change the background
that we could do a easier inspiration 8
That we could do all our lessons on the laptops.
That we could take them home .
that we could type everything with that and uas them in all the classes(not waste paper or write anymore)
that we could use them i every class
that we get to keep them for good
That we use them in other classes.
That we would do more projects on the lab tops so we can help our selfs skill wise.
that we would get on more math games than work on the book i learn more this way and have fun
that we would get to play games more
That we wouldn't have to do the things that require a lot of research,because we never finish it.
that you can't go on fun games
that you could play more games
that you get to play free games on fridays
the games
The heat from them is hot and i would make it cooler.
the home page. please but. i like it to.
The Internet Server.
The mouse. They might be great to use but the wires get hung up on other mouses.
The research
the rules
the screan
the screen saver.
the tipeing
The tuch pad
the way i learn about it
the website blocks
The websites to go to. I would give some sites to go to.

If you could change anything about using laptop computers in class, what would you change?
the work
the work that is on it. i would play games all the times
the world
their is nothing I would chane
Them having the lesson on the you can read.
There is nothing i would like to change.
There would be no work.
There's nothing really I would like to change.
they block ALOT of websites that aren't bad at all
they can be more games
to be able to play more games
to do math, science, social studies,and language arts in ever class I have.
To do more games on them like i put up there we rarely do any games or like on the internet games but i love using them and i would just to use them next year in the sixth garde like in science or reading i would love to use them next year. but this year has been great with the labtops.
to have more free time
To have more games and fun stuff to do on them.
To have more laptops in other classrooms
To have more time to spend on them.
to have them in all classes
to learn more about the laptops.
to learn more on the laptop
to make more easy for people who can't do it that good.
To make the research 100 percent right because its kind of hard to find the correct answers.
to make the sites eaiser to get to
To play internet games
to play more games
to play more history related games
To take them home with you.
to use the movie maker
unblock YouTube.
Us being able to change our desk top or backround for our home screen.
Use for very fun things.
use it more often
use it MORE often.
Use them all the time.
Use then almost every day.
using it more
Using it more for multiplication & fractions.
Using them more.
we could change the bacckground
we could get on them everyday
We could have some free time on a day if the class is good.
we could play games onit everyday.

If you could change anything about using laptop computers in class, what would you change?
we could take them home
we could use it in any class not just science.
We could use laptops more often than what we do now.
We could use them more.
we gert to plat more games
we get more time to work on our assingements in class
we get more time to work on our assingment 'sclass
We would be able to get on it whenever we want.
well i like thim how they are and i would not ching anything about thim
were they are
When you need help on a proplem all you got to is write and submit it to your teachers.
work more in groups
work with your freinds when you get on the computer
You can play games.
You could talk the website and it go there instead of typing it
You could Use the Laptops in every class not just Science.
you get free time
you get to listen to music
You getting to use them to help on the work not in the laptops.
you have to spell everything correct
you would get on any thing you want

## Appendix F

### Responses about Any Other Comments Question from Student Technology Questionnaire

Any other comments?
"I really think it would be nice to have the labtops next year!"
???????????????
After using the laptops it has made me want to learn more than I had ever imagined. Also it has made me want to use the laptops in every classroom.
better web sites
Computar make learning more fun
have new websites.
Having the labtops makes it easier for me to do research or look up what I need to know
i hope we get these in our other classes
I absolutely love the laptops!!!!!!!!!!!!!!
I am glad that we have laptops at our school. It has been a great opportunity.
I do have one comment. That I really look forward to using the laptops the rest of my years here at Bethel Springs Elementary!!!
i dont realy have any comments
I have always had good grades, and I want labtops next year.
I have enjoyed using the laptops this year and hope we can do it next year.
I have none.
I hope that next years 4 graders could have laptops to help make learning easy for them and for next years 6 grade also.
i hope the whole school can get labtops!
I hope to get these next year
I hope we get laptops next year. I love the laptops
I hope we have the laptops next year too!
I hopeto have laptops next year
I Like How They Are, And I Would Like To Have Them Next Year Because I Like Them And I Like How The Labtops.
I like the computer and like learning with it alot.
I like the computers.
i like the laptops
I like the laptops alot and want to use them every year, in every class for the rest of my school years!!!
i like the laptops alot i hope we have them next year in class
I like to tyle words and play gamesto!
I like using the laptop

Any other comments?
I love computers in the class room.
I love coputers
I LOVE LABTOPS!!
I love laptops!!
I LOVE Laptops!!!!!!!!
I LOVE LAPTOPS!!!!!!!!!!!!
I love strawberries:)
i love the compters in the class room, it makes the work alot easy.
I love the laptop classroom,and hope to see them next year.
I love the laptop computers because it makes learning stuff more fun. We get to do stuff thats not in the book. I wish I could have one in all my classes.
I love the laptops
i love the laptops and i hope we can see thim next years and that is about all.
i love the laptops!!!!!!
I LOVE the laptops.I would be so happy if we got to use them next year in the sixth grade.They are a good way to learn and I would rather use them than textbooks anyday.
I love the show I Love Lucy!!!!
I Love Them!!
i love these and i want them really bad in higher grades!!!!!!!!!!!!!!!!!!!!
I love useing laptops
I LOVE USING LAPTOPS
I LOVE using laptops in class.
I love using the computers and I wish i didn't have to quit using them.
i love using the laptops
I love using the laptops so much beacause they are so fun! [[and it keeps from doing really hard math]]
I love using the laptops, they've been a good learning tool. Every grade, every class, every school needs them
I love using the laptops.
I love working on the laptops
I love, love, love these computers, thank you very much.
I loved having the labtops this year.
I loved it
i really do enjoy labtops they have really helped me this year!!!
I really enjoy the labtops ,and hope you will decide to let us use them next year.
I really enjoyed using the laptops.
i really hope we get laptops next year.



Any other comments?
I would really appreciate it if the board would get laptops for 8th grade next year to cause I learn so much with the ease of a laptop
i would like to have these computer all the time
idk about that.
it is awesome in Mrs.kirkmans class
it is awesome.
It is great
it is really fun & thank u.
It is really fun having laptops and I hope we have them again next year.
it is so much better if we keep using computers.
it is verry fun
it is very fun
it would be easier if we could download
it's a great way to lean
It's easy with a fun teacher
it's fun and awesome
it's good to have lab tops to help you to find info
It's way better than writing all the time
its great
its hard
just that i love using LABTOPS
Lab tops are really good to use.
laptops are awesome
Laptops are cool.
laptops are fun
laptops in every class.
laptops make learning fun!
Mrs.Rogers is a awesome and kind teacher.
My only other comment is that we should use the laptops just a little more.
My teachers are awesome and are really funny!!
No
no i do not have any
NO Not really
No not really,except I really really really like the labtops.

Any other comments?
no sir or mam
No thank you.
no!
No!!!
no!!!!!!!!!!!!
No, Thank you
no.
No.Nothing.
non
none
none what so ever
None.
Nop
nope
NOPE! HOW DID I DO?!
Nope.
nope.....
nope=]=]=]=]=]=]=]=]=]=]=]
not any comments.
nothing
nothing else
nothing thank yall.
nun
ok I have a comment for you getting to using the laptop every year
Please put labtops in the oother classes!
Please put laptops in everyroom.
please take laptops out of this room.
PLZ!!!!!!!!!!!! let us use them next year or i will not like this kidding!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! :)
tell the teacher's to let us play games more
Thank you for giving us the opportunity to use these computers.
Thank you for giving us the opportunity to use these laptops.
Thank you for having the laptops in class!
Thank you for putting labtops in our school!!!!!!!!!!!!
thank you for the laptops



<b>Any other comments?</b>
THANK YOU WHO EVER DECIDED TO LET SCHOOLS HAVE LAPTOPS FOR CLASSES!!!!!!!!!!!!!!!!!!!!!!!!!!!!
thanks
thanks for everything!!!!!!
Thanks for letting us use the laptops for 2007 thru 2008.
that the whole 5th grade could have laptops next year that is all I ask!!!!!!!!!!
That I would like to use laptops next year, and they really make you learn more.
That the laptops are wonderful and I hope that we have them next year!!!
that we could all have them instead of share and personalize them but no bad stuff!!!
the computers were a great reference to use for learning
the laptops are a really good way to help other kids get their work done .so there will be less kids getting in trouble.
The laptops are awesome!!!!!!!!!!!! I would love to have them next year.
the laptops are great and also give us a good edu
The laptops are great. They help me learn.
The laptops have really helped me this year, and I hope we have them next year.
There Awesome!
there great!!!!!!!!!!!!!!!!!!!!!!!!!!!!
These laptops really need to be in other classes.
they are fun to use
they are great we really like them
They are Great!
They have helped with a lot of stuff and I can type much better!
they need to let us check our email i mean it ain't hurting the computer any but i learned a lot and i hope to learn more!!!!
this is awesome
this is really the best thing for a classroom it helps me learn a lot of things that are new to me
to us there is 6th grade
Using computers in school is great!!!
Using laptops this year was very fun and I think that we have gotten a lot done this year.
Using the laptop has been real fun because we got to go on the internet, play games, and do fun projects.
we can get on webkinz and take care of our pets and learn responsibilities and you can learn science stuff on the quiz place.
We also need mouse pads.
WE NEED MORE COMPUTERS IN CLASSES
we need to get on webkinz to learn responsibility and we can learn animal science!!!!!!!!!!!!!!!!!!!!

