Leveraging Laptops: Effective Models for Enhancing Student Achievement
Project Research Report
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Acknowledgments

Executive Summary

The *Leveraging Laptops* program is a research based method for gathering data on the integration of laptop computers as tool for learning. In collaboration with the districts and educational researchers from across the state, the Florida Department of Education is able to understand the impact of laptop computers in the learning process. The *Leveraging Laptops* program has been funded by Title II-D, *Enhancing Education Through Technology.*

The purpose of the *Leveraging Laptops* program was to develop effective models for enhancing student achievement through the integration of laptop computer tools for teaching and learning in the classroom. The Research Oversight Committee was appointed by the Bureau of Instruction and Innovation to collect and analyze data about how this funding impacted teaching practices and student achievement.

The program and the research involved 440 teachers across subject areas in 47 K-12 schools in 11 districts. It is estimated that the program directly reached over 20,000 students during the project period. In coming years, the resources and pedagogical skills that were brought to each district for the project will continue to benefit students in the 11 participating districts.

Each district participated in a research design consisting of five components: interviews with district project coordinators, teacher surveys, school-level observation studies of the laptop classrooms, mentored teacher inquiry (action research) into effectiveness of technology-supported teaching, and examination of project-related documents.

The findings indicate that positive changes in teaching practices and student learning were realized as a result of the infusion of professional development, support, and access to classroom technology.

Specifically:

- 78% of action research teachers documented changes in student achievement including test scores, higher level thinking skills, retention, and transfer of learning.
- Nearly 60% of action research teachers documented an increase in conditions that support learning: enjoyment, motivation, engagement, on-task behavior, and positive school experience.
- Students developed 21st Century Skills such as collaboration, computer skills, workforce skills, abilities as producers, communication skills, leadership abilities, innovation and creativity.
- Instructional practices shifted from traditional teaching strategies to ones that are student-centered and engage learners in meaningful use of computers to enhance learning.
- Significant increases were observed related to the following student-centered instructional strategies:
    - student attention, interest and engagement;
    - project-based learning;
    - teachers acting as facilitators and coaches;
    - cooperative/collaborative learning;
    - independent inquiry/research;
    - academically focused class time;
    - computers used as a learning tool; and

- utilization of computers to support critical thinking skills
- Significant decreases were observed related to teacher-centered, traditional practices:
    - Independent seatwork
    - Direct instruction
- Computers used as a delivery tool
    - Using the computer to support lower-level thinking

In numerous cases the results of Florida's *Leveraging Laptops* evaluation far exceeded national norms in terms of the types and amount of student-centered teaching practices observed. Evaluation results demonstrate that *Leveraging Laptops* funding has served as a catalyst for positive changes related to both teaching practices and student achievement in the 11 participating districts.

Recommendations for Policy, Practice, and Research

Based on the results of this research, we offer the following recommendations.

For the Florida Department of Education and state policymakers:

- The changes observed as a result of the 2006-2007 EETT funding to eleven small, medium, and large districts are possible in classrooms across Florida.
    - State budgets that are constructed to support the expansion of such initiatives statewide beyond the scope of single-year projects will result in educational experiences designed to prepare students for continued education and for the global workforce of coming decades.
- Instructional materials policies should be revised to include technology-related materials that support innovative districts in ensuring that appropriate technology is available to students, in particular students who do not have access to these resources outside of school.
- Systematic educator professional development such as the experiences provided through the *Florida Digital Educator* program should receive continued support.
- Broad-scale research efforts into the real effects of innovations in classrooms such as this research should continue and should be structured to facilitate longitudinal data aggregation.
    - Such coordinated efforts will magnify the benefits of both funding to districts and the research data across the state.

For teachers, administrators, and school district staff:

- Based on the significant changes in teaching practices and student performance that occurred in the spring of the project year, it is reasonable for educators to have high expectations for teaching and learning with the infusion of professional development, support, and technology.
    - Each of those three elements is necessary and must be integrated together in ways that work toward achieving school, district and state goals.
- The first year of a major change in teaching is a year for learning by teachers, administrators, and students, and it is likely that, given sustained professional development and support, the changes observed in classrooms will continue and probably magnify as teachers refine their practices and students acquire and apply technology and information skills to their academic work.

- The types of twenty-first century skills developed in this project have limited presence on current standardized tests. Teachers, administrators, and school district staff who value the benefits of integrating technology should recognize that increases in student motivation, engagement, and other affective traits that have been seen in association with project-based, community-based, and other important forms of learning may not lead to improvements in all skills as they are assessed on current standardized tests.
- Students who are new to using technology for educational purposes and students who struggle academically may need specific instruction on how to learn with technology.
- Students who use school computers outside of school need guidelines and information about policies for caring for their computers.

For parents and community leaders:

- Notable improvements in student performance were observed in districts that included rich community partnerships and where students had laptops for home use.
- Schools and students need these strong relationships in order to maximize the effect of the teachers' efforts and use of the technology.

For researchers:

- The perspectives of students and members of the community are integral to the success of school reform and should be considered as important components in data collection strategies.
- Longitudinal views of the changes occurring in students' lives, their classrooms, and their schools are the most precise way to learn about how significant educational change.
- Research on classroom technology impacts requires a fine focus on student learning outcomes as defined at the lesson level.
- Continued use of validated classroom observation measures provides an accurate picture of what students and teachers can do with the important resources available to them.

Program Overview

The purpose of the *Leveraging Laptops* program was to develop effective models for enhancing student achievement through integration of laptop computer tools for teaching and learning in the classroom. The program involved 440 teachers across subject areas in 47 K-12 schools in eleven districts. It is estimated that the program directly reached over 20,000 students during the performance period: April, 2006 – June, 2007. A total of $10,836,136 was awarded among the districts from Title II-D, *Enhancing Education Through Technology.*

The *Leveraging Laptops* program built on the 2004 report to Florida's Commissioner of Education, Jim Horne, prepared by the Florida Laptops for Learning Task Force. The Task Force was comprised of a group of educators from K-20 settings across the state. Their report, located at http://etc.usf.edu/L4L/Index.html, made three major recommendations. The first recommendation was that laptop initiatives conform to the following guiding principles.

- All students must have access to appropriate tools and to challenging curriculum in order to bridge the digital divide by moving beyond basics and towards 21st century skills.
- 21st century curriculum must be infused with skills necessary for living and working in an ever-changing society. Relevant, real world education should include:
  - information and communication skills
  - thinking and problem-solving skills
  - interpersonal and self-directional skills
- Teachers must create instructional environments in which students use higher order cognitive skills to construct meaning or knowledge, engage in disciplined inquiry, and work on products that have value beyond school.
- Successful professional development:
  - must be held on a continuous basis
  - provides mentors, coaches, or peer teammates to model appropriate integration strategies in actual classrooms
  - gives teachers feedback on their own performance
  - holds teachers accountable for implementing instructional strategies and student learning
- Preservice teachers must:
  - experience good models of technology integration in all their preservice classes
  - have access to a laptop computer to support their coursework and field experiences
  - have field experiences that include an opportunity to teach in a 1:1 environment
- Students and teachers must have access to rich multimedia resources to:
  - extend their world and life experiences
  - engage their senses
  - incorporate into their own multimedia projects
  - provide building blocks of instruction

- Laptop hardware and software must be sufficient to allow students to be creators of content, not merely passive receivers of content. The laptop must be available to use as a cognitive tool wherever and whenever the student is working.

- Technology support procedures and planning must be adequate to prevent disruptions in laptop availability. Support should be handled at the lowest level practical.

    - The end-user (teacher or student) should be taught to exercise problem-solving skills in handling routine maintenance.

    - A school-based support staff should be able to handle the majority of technical issues on a timely basis and provide a loaner laptop while the repair is being made.

    - District support or other outsourcing should be available to handle major repairs.

- In addition to the testing of basic skills, students should be given the opportunity to demonstrate 21st century skills through the use of technology-infused, authentic assessments. Assessment should become more integrated with instruction.

The *Leveraging Laptops* program addressed eight of the nine guiding principles (preservice teacher preparation was not directly involved) in an intensive one-year implementation and research effort.

The eleven participating districts represented the diversity that is present in public education in Florida. The districts ranged in size from the smallest with just six K-12 schools to the largest with 317 K-12 schools. A wide array of economies was represented in the participating communities, from urban to agricultural. Correspondingly, the numbers of schools and teachers reached in this program varied across the state, as shown in Table 1.

Table 1. EETT Teachers and Schools by Funded District

District	Number of EETT Teachers per Funded District	Number of EETT Schools per Funded District
Escambia	43	5
Gadsden	17	3
Hendry	13	2
Hillsborough	26	6
Lake	128	8
Madison	11	5
Manatee	15	2
Miami-Dade	17	1
Pinellas	62	3
Seminole	78	4
Taylor	20	2
TOTAL	430	41

Each district assessed its educational needs when identifying the schools and students to target with the program's resources. In some districts, a single grade level or subject area was the focus, while in other districts the focus was spread across many schools, subjects, and levels. A unique and laudable feature of Florida's laptop initiative was the latitude given to the districts to design models that best meet their needs. This report provides detailed descriptions of the district models and the outcomes of their efforts.

Research Overview

The Research Oversight Committee for the *Leveraging Laptops* program was appointed by the Bureau of Instruction and Innovation to collect and analyze data about the district models. The research framework is a cluster evaluation that looks across the eleven district models in order to learn lessons about their effectiveness, as well as to generate knowledge and guidance about strategies for implementation (Patton, 2001). The research has resulted in high-quality lessons learned about laptop implementation from eleven diverse contexts. These lessons have external validity due to the multiple sources of independent data being triangulated in this evaluation.

The research committee applied Hall's (1995) conception of conditions, processes and consequences to explore the 1:1 computing efforts in the eleven participating districts. This framework is very similar in theory to the "Evaluation Framework for 1:1 Computing" developed by SRI International (Zucker, 2004). The research team used Hall's terminology because we believe it is clear to a wide range of stakeholders; however, much of our work is informed by the SRI International evaluation framework. Table 2 outlines the components of our research within Hall's framework and distinguishes between the terminologies used by Hall and Zucker.

Table 2. Research framework

Conditions (Hall, 1995) Critical Features (Zucker, 2004)	Processes (Hall, 1995) Interactions & Immediate Outcomes (Zucker, 2004)	Consequences (Hall, 1995) Ultimate Outcomes (Zucker, 2005)
Technology used	Professional development	Student achievement
Setting	Teaching and instructional practices: student-centered and tool-based	Changes in teacher practices: student-centered and tool-based
Implementation plan	Technology deployment	Impact on parents
Goals and objectives		Sustainability

The purpose of the research activities was to learn about and report on the effective practices in use in the districts for laptop integration. The following evaluation question was developed in collaboration with officials from the Florida Department of Education, grant coordinators from the districts funded through the *Leveraging Laptops* program, and the Research Oversight Committee. Each district's project participants were engaged in setting their own goals for the project, in particular in the area of student achievement related to the classroom use of laptop computers. In this way, a developmental evaluation was undertaken that supported project development and continuous improvement in each school and district (Patton, 1994).

Research Question:

What changes in tool-based, student-centered teaching happen as a result of the infusion of technology and professional development?

As a result of the *Leveraging Laptops* program and research, educators across Florida will learn through the dissemination of results and effective practice how a range of laptop implementations contribute to student-centered teaching and classroom use of technology tools. Dissemination that has already been accomplished as well as planned dissemination efforts are described in Appendix E of this report. Multiple

methods of data collection were used to answer the evaluation questions. Table 3 summarizes how these data collection methods fit within our research framework.

1. <u>School Observations:</u> We used the measures developed at the Center for Research in Educational Policy (CREP) to ascertain teaching and instructional practices within schools involved in the state-funded 1:1 computing initiatives. These observations informed our knowledge of questions 2 (processes), question 3 (consequences) and question 4 (lessons learned). The School Observation component is described in detail in the "School Observation" section of this report.

2. <u>Document Analysis:</u> An analysis of the grant proposals, district web sites, a web survey of district stakeholders, and other artifacts will inform question 1 (conditions) and question 4 (lessons learned).

3. <u>Interviews with Grant Coordinators</u>: Semi-structured interviews with grant coordinators were conducted to triangulate document analysis and inform question 1 (conditions) and question 4 (lessons learned). The district implementations are described further in Appendix D of this report.

4. <u>Teacher Inquiry:</u> Teachers from 1:1 computing classrooms in each district conducted action research to inform question 3 (consequences) and question 4 (lessons learned). Specifically, these teachers received mentoring in using teacher inquiry to determine how their 1:1 computing efforts influenced student achievement. Teacher inquiry was chosen because of the short time frame of our research, the inherent problems using standardized test data to document the effect of technology use (Means, 2004) and the importance of documenting classroom-based student achievement (Dawson & Ferdig, 2006). This research component is described fully in the "Teacher Action Research" section of the report.

5. <u>Teacher Survey</u>: A survey developed by an expert in survey design was administered to all teachers participating in the state-funded 1:1 computing initiatives. This survey was used to triangulate data collected by other means and to inform question 1 (conditions), question 2 (processes) and question 3 (consequences). The results of this research component are included in the "Participating Teachers" section of this report.

Table 3. Data collection methods

Conditions	Processes	Consequences
Technology used (Documents and interviews)	Professional development (Documents, interviews and surveys)	Student achievement (Teacher inquiry)
Setting (Documents and interviews)	Teaching and instructional practices: student-centered and tool-based (School observations)	Changes in teacher practices: student-centered and tool-based (School observations and surveys)
Implementation plan (Documents, interviews and surveys)	Technology deployment (Documents, interviews and surveys)	Impact on parents (Documents and interviews)
Goals and objectives (Documents and interviews)		Sustainability (All)

Data from each strategy was first analyzed independently and a descriptive profile of 1:1 computing in each district was developed. Then, we used a conditional matrix (Strauss & Corbin, 1990) to organize the wealth

of data and distinguish linkages between and among the conditions, processes and consequences of 1:1 computing across Florida. Florida's *Leveraging Laptops* initiative is particularly interesting because of the autonomy given to individual districts and because of the inclusion of a multi-university Research Oversight Committee. Such a combination has the potential to significantly contribute to our knowledge base related to 1:1 computing.

The following sections provide details about the research components, the data collected, and the results.

Review Of Related Literature

Successful use of laptops in Australian schools catalyzed their use in the United States. Microsoft's Learning Anytime Anywhere Learning Program (AAL) is considered the father of laptop programs in the U.S. (Healey, 1999) and recent figures suggest over 54% of schools have instructional laptops (Market Data Retrieval, 2005). The ways these instructional laptops are deployed in classrooms vary significantly from concentrated use where each student has his/her own laptop for use at home and in school to classroom sets or mobile carts shared by a group of teachers to a dispersed model where there are a few laptops in certain classrooms to laptop classrooms that function similarly to computer labs (Rockman, 1997).

Likewise, the purposes for implementing laptops vary from school to school and district to district. Common goals include influencing student achievement in specific content areas or across content areas, increasing student-centered teaching practices, positively impacting the digital divide and improving home-school connection. These are lofty goals, indeed, yet research related to laptop computing is mixed and few studies have been published in refereed outlets (Warschaeur, 2006). Thus, this literature review includes both refereed and non-refereed studies.

The most commonly cited advantages to laptop implementation are increased technology use and proficiency (Walker, Rockman & Chessler, 2000; Silvernail & Lane, 2004; Penuel, 2005), and increased student engagement, motivation, attitude and confidence (Gardner, Morrison & Jarman, 1993; Rockman et. al., 1998; Warschauer, 2006). Other advantages reported include better school attendance (Stevenson, 1998; Laptops for Learning Task Force, 2004) and improved student organization, study skills and study habits (Warschauer & Sahl, 2002; Warschauer, 2006).

Research also widely reports changes in teaching practices including shifts toward more student-centered practices (Henriquez and Riconscente, 1999; Stevenson, 1998; Rockman et. al, 1998; Fairman, 2004), an increased emphasis on inquiry-based practices (Fisher & Stolarchuk, 1998), an increase in cooperative learning and project-based instruction (Warschauer & Sahl, 2002; Fairman, 2004), and more differentiated instruction (Fairman, 2004).

Other positive effects of laptop use include better teacher/student relationships (Fairman, 2004), improved home-school relationships (Russell, Bebell & Higgins, 2004), bridging the digital divide (Gravelle, 2003) and the perception that laptops provide social and academic benefits for special education students (Harris & Smith, 2004).

The most inconclusive findings related to laptop use in schools involve their impact on student achievement. Some studies report increased levels of academic performance as compared to students without laptops (Stevenson, 1998; Lowther, Ross & Morrison, 2003; Warschauer, 2006) while other studies report marginal effects (Gardner, 1993; Silvernail, 2005; Warschauer & Grimes, 2005). Recent studies focusing on literacy and laptop use report advantages for laptop users on tests of writing and problem solving skills (Lowther, Ross & Morrison, 2003) while others claim that standardized paper and pencil tests of writing skill do not adequately reflect the writing skills developed through extensive experience with the computer (Russell & Plati, 2002).

The most comprehensive laptop study to date relates to literacy and suggests that laptops have not led to an increase or decline in reading scores but rather has contributed to students "gaining a broader set of skills, knowledge and abilities that in the long run will benefit other aspects of their learning and literacy

development beyond those measured by standardized reading tests" (Warschauer, 2006, p. 60). In addition, this study reports significant changes in the way writing is taught. It documents shifts toward more interdisciplinary, iterative, public, collaborative, purposeful and authentic writing tasks as well as more diversity in the genres of writing used in instruction. The study also suggests laptop use leads to higher quality final products, more autonomy in the writing process, more just-in-time, individualized and in-depth learning, more empirical investigation related to writing topics, and development of multimedia literacy that demonstrates 21st century ways of representing and constructing knowledge (Warschauer, 2006).

Regardless of research results, public schools have had difficulty sustaining full-scale one-to-one laptop programs (Warschauer, 2006) yet they are increasing in number and size (Penuel, 2006) through grant, parental and district level funding. Thus, the need for quality research related to the effects of laptop integration is increasing as well. Zucker (2004) proposed a research agenda for ubiquitous computing in which it suggests that:

> Perhaps the value of 1:1 computing initiatives does not lie mainly in a small number of major benefits, such as raising test scores in core academic subjects. Instead, as seems increasingly likely, the benefits of 1:1 computing may come in numerous forms, many of which are difficult to quantify, and no one of which is sufficient to justify the investment. Yet, in total, the multiple benefits of 1:1 computing may provide students and the public with substantial value—enough to justify the sizable investments that are necessary to provide every teacher and student with a computer.

Our research related to laptop computing in eleven Florida districts highlights the complexity of such initiatives by considering the conditions, processes and consequences within and across districts.

The State Profile

Overview of districts

Information about each district's laptop implementation model was collected using the districts' grant proposal documents, semi-structured interviews with district project coordinators, a survey of district stakeholders, and the district project websites.

Each district project coordinator was asked the following questions in a telephone interview during the Fall of 2006.

Conditions

- Describe the district's history in 1:1 computing by talking about past laptop/Palm/iPod projects in schools to give us an idea of where the district is its development of 1:1 computing programs. (setting)

- Discuss the factors that influenced your planning when you developed the current project proposal. (implementation)

- In your mind, what is the central purpose of the laptops for your students and teachers?

- Based on those intended purposes, provide insights into your decisions about the content areas, hardware, and other products (such as LCD projectors) included in your EETT program. (implementation)

- What partnerships with organizations are included in this year's program? (implementation)
    - What issues or concerns have arisen from the partnerships?

- Verify the grade levels and content areas of the teachers participating in the EETT program this year. (setting)

- How would you describe the kinds of effective teaching you expect to be happening in the laptop classrooms by the end of this school year? (goals)

Processes

- How has possible growth in the participating classrooms been handled or accommodated in the program planning? (deployment)

- What support is provided to teachers, both for their technology and for using the technology for their curriculum objectives? (deployment)

- Provide details about the deployment of hardware, software, and services acquired for this project. (deployment)
    - Give an example or two of how teachers have been using the resources they have received. (teaching)
    - What percentage/proportion of the purchased resources (hardware, software, and services) are currently deployed?

- What professional development experiences are included in the program in addition to summer institutes? (professional development)
    - What professional development experiences are all teachers expected to participate in?

- What options have been provided?

- How have parents been involved in the project? (parents)

  - What has been the reaction of parents so far?

  - What methods have you used to get feedback from parents?

Consequences

- How many students do you expect to be directly affected in this project?

- In thinking about all aspects of the EETT program to this point, what has happened that has surprised you or been unexpected?

- To what factors do you attribute the success of the project so far? What have been the major factors in any obstacles or challenges you have experienced?

- What plans does the district have to sustain the progress of this year?

- If you were able to change one thing about the EETT program, in relation to the RFP, your proposal, your implementation, or another factor, what would it be?

- What future plans/goals does the district have for 1:1 computing programs? (sustainability)

General

- How are you evaluating the project within the schools and district?

- Are you assessing the effect of the project on student achievement?

- What anecdotes can you share about the project?

- What else would you like the evaluation team, the DOE, or the legislators to know about your project?

District profiles describing each district's project context, processes, and results are located in Appendix D of this report.

The State Profile

The following table summarizes the Conditions, Processes, and Consequences of the Laptops for Learning program. Further detail is included in the following sections of this report.

Conditions	
Technology used (Documents and interviews)	– Each district supplied laptop computers to the participating classrooms. – In addition, districts selected a range of supporting hardware, software, and web services for teacher and student use. – Hardware included handheld computers, tablet computers, digital cameras, printers, projectors, microscopes, probes, music players, and calculators. – Software included concept mapping tools, web editing tools, productivity suites, and media development tools. – Web services included content-specific subscriptions and general academic research services.

Conditions	
Setting (Documents and interviews)	– The number of participating schools in each district ranged from one to eight, with most districts focusing on between two and five schools for this project. – Fifteen of the schools were elementary schools, thirteen were middle schools, and eleven were high schools. – Three of the districts were large urban districts, four were mid-sized suburban districts, and four were small rural districts. – In each district, the number of classrooms involved ranged from 11 to 128. – All grades from 1-12 were involved, and most classroom subjects were represented. – The districts' prior experience with 1:1 classroom computing varied. Only one district had no prior laptop program. – One district had a school with nearly a 1:1 student-computer ratio. – Two districts had at least one school with 1:1 computing, and the remaining five districts had schools in which computer lab carts were used.
Implementation plan (Documents, interviews and surveys)	– District planners considered several factors in developing their project designs. – The most frequently stated factors were low academic performance of students (4 districts), the need to fill a technology gap in the district, primarily in areas of poverty in which students lacked access to technology (6 districts), and a commitment to fostering the types of student-centered project-based teaching that require increased access to technology (4 districts). – Other factors that influenced project designs were a desire to build on a history of strong professional development in technology (1 district), and the need to provide technology in a growing district (1 district). – In determining the types of technology to provide with the funding, the district planners most often considered the fit between the technology and the project goals (7 districts), but also considered the fit between the technology and broader district goals (6 districts), and the fit between the technology and the desired teaching and learning outcomes (1 district).
Goals and objectives (Documents and interviews)	– Most of the projects were designed to achieve multiple goals. – The most common goal among the districts was to promote student-centered, project-based, inquiry-oriented, or active learning (7 districts). – Other goals included improving academic performance in language arts and science (8 districts total), providing the tools students and teachers need to succeed (3 districts), improving student motivation and behavior (2 districts), and supporting community-centered learning (1 district).

Summary of state conditions:
– Each district determined its own needs and goals, and then planned accordingly.
– The result was a wide range of conditions within which the 1:1 projects took place.
– It is noteworthy that student needs drove each design and that each district took into account multiple factors during the decision-making stages in order to succeed.

Processes	
Professional development (Documents, interviews and surveys)	– Districts used several strategies for supporting teacher learning during the project. – Most of the participating teachers took part in the Florida Digital Educator summer institutes offered around the state. – Three districts provided additional targeted summer in-service experiences. – During the school year, districts provided professional development sessions focused on the project's hardware, software, teaching methods, and academic content. – Seven districts provided access to continual online professional development opportunities. – Additional professional development processes used by small numbers of districts included learning communities (3), 1:1 coaching and modeling (3), use of external trainers (1), custom consulting for teachers (3), and off-site experiences at community sites (1). – Two districts offered professional development for the school and district administrators who were involved in the laptop project.
Teaching and instructional practices: student-centered and tool-based (School observations)	– In the first half of the year when the classrooms had just received the technology, over 90% of teachers were observed using direct instructional methods occasionally or frequently, and fewer than 30% were using cooperative/collaborative teaching. – Only 20% were occasionally using project based teaching, about 40% were teaching as coach/facilitator, and 85% were using independent seatwork. – Nearly 80% were using technology for instruction, but only about 40% were using it as a learning tool or resource. – The next table, "Consequences," describes the changes seen in the second half of the year.
Technology deployment (Documents, interviews and surveys)	– All districts provided network/Internet access for classroom computers, either wired or wireless. – Most districts placed the hardware and software in classrooms and in shared school spaces on carts. – Three districts allowed home check out of computers.
Support (Documents, interviews, and surveys)	– All districts provided either full-time school-based or district-based technical support to the participating teachers. – Two districts prepared student technicians to support the technology. – Two districts identified teachers or coaches on assignment to provide curricular support to the teachers.
Parent involvement (Documents and interviews)	– Eight districts scheduled open houses, parent nights, or workshops for parents at the schools. – Schools in three districts used print newsletters to inform parents of the project. – All districts additionally employed some or all of the following approaches: project and classroom websites for parent communication, parent volunteers, and school technology clubs open to parents.
Summary of state processes: – Each district carefully selected and provided appropriate technology, support, and communication with stakeholders. – Innovative methods were used to meet specific local needs in these areas.	

Consequences	
Student achievement (Teacher inquiry)	– The educational results reported by the teachers were overwhelmingly positive. – Thirty-five of the forty-six teachers engaged in Action Research documented changes in student achievement including test scores, higher level thinking skills, retention, and transfer of learning. In one elementary classroom and two middle school classrooms, negative effects such as a decrease in writing scores and a high level of frustration were reported, and in each case these effects were attributed to inexperience in the students with the technology that they were learning to use simultaneously with learning the class lesson. – In all other cases, teachers reported noticeable or significant improvements in student performance, in some cases exceeding the teachers' expectations. – Twenty-six of the teachers reported increases in conditions that support learning: enjoyment, motivation, engagement, on-task behavior, and positive school experience. Thirteen teachers stated that students had demonstrated strong 21st Century Skills such as collaboration, computer skills, workforce skills, abilities as producers, communication skills, leadership abilities, innovation and creativity. – Smaller numbers of teachers documented positive changes in their teaching, changes in the classroom culture or dynamic due to unique technology affordances, and improved ability to reach students of varying abilities.
Changes in teacher practices: student-centered and tool-based (School observations and surveys)	– In the second half of the year, the following changes in teaching were observed: – Direct instructional methods decreased significantly from over 90% of teachers occasionally or frequently observed to 78% – Cooperative/collaborative teaching increased from fewer than 30% occasionally or frequently observed to 52% – Project based teaching increased significantly from 20% occasionally observed to 50% occasionally or frequently observed, and exceeded national norms – Teaching as coach/facilitator increased from about 40% occasionally or frequently observed to 70% – Independent seatwork decreased significantly from about 85% occasionally or frequently observed to 54% – Student independent inquiry and research increased significantly, and exceeded national norms – The use of technology as a learning resource or tool increased significantly from 41% occasionally or frequently observed to 72%, and exceeded national norms – The levels of student attention, interest, and engagement significantly increased from Fall to Spring – Use of all types of production and Internet tool technology increased from Fall to Spring, and exceeded national norms in all categories – Overall meaningful and very meaningful use of technology increased significantly
Summary of state consequences:	
– Every district saw positive academic outcomes as a result of the project and is committed to finding ways to continue this and similar initiatives.	

A summary of key findings and conclusions are located in the Summary of Findings section of this report.

Participating Teachers

A survey was developed to collect information from teachers about their professional development and initial uses of technology in their classrooms. This information provides a picture of how technology is used by the teacher in the initial stages of the *Leveraging Laptops* project, and serves as a triangulation point for data collected by other means.

The survey developed by the Research Oversight Committee drew from the literature on technology professional development (Bradshaw, 2002; Christensen, 2002; Fulton, 1999; Hughes & Ooms, 2004; Margerum-Leys & Marx, 2004; Means & Olson, 1995; Mouza, 2003; Orr, 2001; Vannatta & Fordham, 2004).

Instrumentation

The instrument employed in this evaluation project was collaboratively developed by the research committee to measure teacher professional development experiences and perceptions, and use of computers in the classroom. The instrument also included other relevant criteria, such as a teacher's content area, pedagogy, and technology experience. As a starting place, the research team identified a survey previously used to characterize the nature of technology use in the classroom (Harmes, Kemker, Kalaydjian, & Barron, 2000; Hogarty & Kromrey, 2000). This survey was adapted to suit the needs of this evaluation program. The instrument was designed to measure four relevant domains: technology integration; support; preparation, confidence and comfort; and attitude toward computer use. In a previous validation study of this instrument, exploratory factor analyses results demonstrated psychometrically sound factors and measures of internal consistency reliability (Cronbach's alpha) exceeding 0.7 for each domain (Harmes et. al., 2000; Hogarty & Kromrey, 2000).

Revisions were made to the descriptors of the instrument to accommodate changes in information and communication technology and pedagogical practices. Additional items were added to the instrument to collect more specific information, such as teacher certification areas. The final instrument included 27 unique items and was published in an online format using the Web Surveyor © software utility. The item formats included dichotomous response items (eg., Math 6-12 Certified), standard Likert scale items ranging from strongly agree (5) to strongly disagree (1), and a 5-point frequency of use scale from one to five (not at all; once a month or less; once a week; several times a week; and everyday).

The web address of the survey was provided to each district's project coordinator who sent it to each teacher. Teachers' names and schools were not requested in the survey. Follow up requests for survey completion were sent via the district coordinators on a minimum of three different occasions over a four-month period.

Respondent Sample

School district email addresses were used as keys to uniquely identify participants. A duplication analysis revealed 25 participants had completed the survey more than once. These additional responses were removed from the dataset, leaving only the initial response from the participant. This resulted in a total of 353 respondents included in the analysis, which is an 82% response rate. Table 4 illustrates the response rates by district.

Table 4. Response rates by district.

District	Participating Teachers	Teacher Respondents	Response Rate
Escambia	43	43	100%
Gadsden	17	14	82%
Hendry	13	11	85%
Hillsborough	26	20	77%
Lake	128	95	74%
Madison	11	10	91%
Manatee	16	16	100%
Miami-Dade	17	16	94%
Pinellas	62	56	90%
Seminole	78	54	69%
Taylor	20	18	90%
TOTAL	**430**	**353**	**82%**

Degrees and Certifications

Fifty-seven percent of the participants have earned a bachelors degree, 36% have an earned masters degree, and the remaining participants reported having an earned doctorate, educational specialist or other credential (eg., National Board Certified).

Most teachers in the sample had earned their degree 14.24 (SD=10.14) years ago. As shown in Table 5, the majority of the teachers included in the sample were certified to teach in the State of Florida through an approved degree program (35.16%) or a college course certification (30.77%). The remaining teachers were certified by transfer from another state (18.14%) or through a district alternative certification (14.84%) program. Teachers reported an average of 12.19 (SD=10.05) years K-12 teaching experience and an average of 13.14 (SD=10.28) years experience in the education profession. Teachers reported having used computers in their classroom for an average of 4.79 (SD=4.63) years.

The teachers involved in the *Leveraging Laptops* project held a number of Florida teaching certifications. The majority of the respondents held Elementary Education K-6 (n=103) and variety of other core subject areas in middle school level and 6-12 grade level certifications. The teacher certifications held by the current sample are shown in Appendix A1.

Table 5. Method of initial Florida teaching certification.

Method	n	%
Approved Degree Program	128	35%
College Course Certification	112	31%
District Alternative Certification	54	15%
Transfer From Another State	67	18%

Results

The analyses consisted of a descriptive analysis of response frequencies and measures of central tendency and variation, and internal consistency reliability (Cronbach's alphas) analysis. No statistical procedures were employed for inferential statistics since the purpose of this report is to describe the population of teachers involved with the *Leveraging Laptops* program. The teachers involved with the program reported an average of 5.46 (SD=8.14) desktop computers always available in their classrooms, and an average of 14.51 (SD=13.11) laptop computers in their classroom as of the Fall 2006 academic semester. The teachers also reported an average of 22.81 (SD=6.03) students in their classroom.

Grade Levels and Subject Areas

As can be gleaned from Table 6, the largest proportion of teachers involved in the laptop for learning program were middle school teachers (sixth, seventh, eighth) followed by high school teachers (ninth through twelfth). The highest proportion of teachers involved in the program taught eighth grade (n=105). Of the respondents in elementary school, the highest proportion of teachers included third grade teachers (n=39).

Table 6. Teacher involvement by grade level.

Grade Level	n	% (yes)	% (no)
Pre-K	5	1.4%	98.6%
Kindergarten	17	4.7%	95.3%
First	20	5.5%	94.5%
Second	25	6.9%	93.1%
Third	39	10.7%	89.3%
Fourth	29	8.0%	92.0%
Fifth	23	6.3%	93.7%
Sixth	90	24.7%	75.3%
Seventh	87	23.9%	76.1%
Eighth	105	28.9%	71.2%
Ninth	58	15.9%	84.1%
Tenth	62	17.0%	83.0%
Eleventh	59	16.2%	83.8%
Twelfth	52	14.3%	85.7%
Adult	11	3.0%	97.0%

The *Leveraging Laptops* teachers instructed a wide array of subject areas in the K-12 curriculum ranging from mathematics to art and music. Table 7 illustrates the subject areas taught by teachers in the *Leveraging Laptops* program. The highest proportion of teachers were teaching science (n=152), shortly followed by mathematics (n=120), English (n=96) and social studies (n=91). There was minimal involvement of art and music teachers (n=8) and vocational education teachers (n=5). There were no teachers currently instructing physical education involved in the project.

Table 7. Teacher subject areas.

Subject area	n	% (yes)	% (no)
English	96	26.4%	73.6%
Reading	87	23.9%	76.1%
Math	120	33.0%	67.0%
Science	152	41.8%	58.2%
Social Studies	91	25.0%	75.0%
Art/Music	8	2.2%	97.8%
Physical Education	0	0.0%	100.0%
Media/Technology Specialist	16	4.4%	95.6%
Special Education	16	4.4%	95.6%
Vocational Education	5	1.4%	98.6%
Other	37	10.2%	89.8%

Teacher Computer Skills and Professional Development

One of the objectives of the survey was to ascertain the source of computer skills and extent to which a teacher acquired computers skills from the source. The Cronbach's alpha for this item demonstrates less than desirable internal consistency reliability at α=.52. As shown in Table 8, more than 50% of the respondents report acquiring computer skills to a small extent or not at all as part of their college coursework, distance learning courses, or the *Teaching and Learning Summer Institutes*. More than 50% of the respondents report acquiring computer skills moderately to entirely from professional development, independent learning and interaction with other faculty and staff.

Table 8. Source of computer skills in percentages.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	28%	26%	21%	19%	4%
Professional Development	3%	23%	32%	37%	4%
Independent learning	3%	19%	27%	43%	6%
Interaction with other faculty/staff	3%	24%	38%	31%	3%
Distance Learning courses	55%	20%	13%	7%	2%
Teaching and Learning Summer Institute	28%	25%	27%	16%	2%

Of particular importance to the *Leveraging Laptops* project are the teachers' perspectives of their professional development opportunities as shown in Table 9. One item for the domain was included on the instrument to gauge the teacher's perspective. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.93. Approximately 73% of teachers report their professional development opportunities focus on both technical and instructional skills required to integrate technology. Fifty percent or more of teachers indicated that professional development opportunities are in the form of after school workshops and that these opportunities are consistent and continual.

Results demonstrate that more than 70% of the teachers involved with the *Leveraging Laptops* project hold favorable (strongly agree or agree) attitudes towards their professional development opportunities in terms of encouraging them to think about how to use technology to support teaching goals (83.24%), encouraging them to collaborate with other colleagues on technology integration (78.57%), encouraging them to thinking about contextual factors that support or hinder technology integration efforts (73%.08), helping them think about how technology may change their teaching practices (85.71%), providing them relevant knowledge and skills for the classroom (74.73%), and encouraging them to use technology to facilitate student learning content (84.62%).

Table 9. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	3%	3%	10%	57%	26%
encourage me collaborate with my colleagues on technology integration.	3%	6%	12%	54%	25%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	3%	4%	19%	52%	21%
help me think about how technology may change my teaching practices.	2%	3%	7%	57%	29%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	4%	8%	12%	51%	23%
encourage me to consider how technology can be used to facilitate student learning of content.	3%	2%	9%	57%	28%
focus on both the technical and instructional skills required to integrate technology.	3%	8%	15%	52%	21%
are traditionally in the form of after school workshops.	7%	13%	22%	44%	13%
are consistent and continual.	7%	13%	23%	45%	12%

Teaching Method with Computers

One item on the instrument aimed at measuring current teaching methods used in concert with computer technology as shown in Table 10. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.88. On a daily basis, results indicate teachers are using computers for instructional delivery (25.55%) and as learning and resource tools (27.2%). It appears the teaching methods with an absence of computer technology include team teaching (41.21%), in centers (36.26%), and for sustained reading (42.03%).

Table 10. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For team teaching	19%	41%	16%	10%	7%	4%
For cooperative/collaborative learning	3%	15%	27%	23%	25%	7%
In centers	11%	36%	16%	9%	13%	12%
For project-based learning	1%	10%	38%	23%	21%	6%
For sustained writing	10%	38%	20%	16%	11%	4%
For sustained reading	8%	42%	16%	14%	11%	7%
For independent inquiry/research	1%	10%	34%	26%	20%	9%
For student discussion/communication	4%	14%	40%	20%	16%	5%
For instructional delivery	1%	9%	15%	15%	33%	26%
As a learning tool/resource	1%	4%	17%	20%	30%	27%
For student assessment	1%	28%	23%	18%	16%	12%

Instructional Support System

A set of items on the instrument pertained to the technology or instructional technology support within the teachers' school environment. The preponderance of schools involved in the *Leveraging Laptops* project, according to teachers, have full-time technology or instructional technology coordinators available (70.6%). A small proportion of teachers report part-time technology support staff (14.56%), while 16.48% of teachers are unsure of whether their technology support staff is full-time or part-time. Only 12.64% of teachers report their technology support is grant-funded. Teachers report an average of 1.86 (SD=4.08), nearly 2, technology support specialists per school.

An attitudinal item regarding teacher perspective of technology support was also included on the instrument. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.85 (negatively stated item reverse coded). Table 11 illustrates the response frequencies in each category. The results are encouraging in that more than 70% of the respondents suggest their technology support specialists adequately assist in problem-solving and troubleshooting, they have specialists dedicated to helping teachers, their specialists have techniques for integrating technology into classroom instruction, and have adequate access to their on-site specialists.

Table 11. Teacher perspective of school technology support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	5%	6%	11%	35%	37%
The on-site computer specialist is dedicated to helping teachers.	4%	5%	11%	29%	46%

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have adequate access to our on-site computer specialist.	6%	9%	11%	38%	30%
I have to contact our specialist several times before I get assistance.	24%	34%	17%	13%	7%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	9%	8%	18%	31%	29%

Teacher Use of Software

Teachers indicated frequent use of a variety of software packages ranging from basic productivity software to wikis and blogs. Productivity software packages are shown in Table 12. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.82. Results suggest that 50% of teachers involved with the *Leveraging Laptops* project use word processing and Internet browsing software everyday. More than 30% of the teachers involved use spreadsheet, database, and presentation software at least once a week. It appears most teachers are not using draw/paint/graphics (26.65%), concept mapping (29.12%), database (28.3%) and authoring (35.71%) software.

Table 12. Teacher use of productivity software packages.

Software category	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Word processing	2%	6%	4%	7%	30%	50%
Spreadsheet	4%	20%	26%	17%	19%	13%
Database	5%	28%	21%	12%	16%	17%
Draw/paint/graphics	6%	27%	27%	16%	17%	5%
Presentation	2%	8%	20%	13%	29%	27%
Authoring	15%	36%	19%	12%	10%	6%
Concept mapping	6%	29%	29%	18%	13%	2%
Internet browser	3%	5%	5%	7%	24%	55%

To gain more perspective, teacher use of productivity software packages was also be examined by discipline and grade level. Table A2 in the Appendix illustrates teacher use of software by discipline. The percentages reflect the number of teachers within the discipline that responded that they used the software used at least once a week. Similar results are shown in the Appendix in Table A3. However, these results reflect teacher use of productivity software by grade level.

Teachers also report the use of a variety of domain specific or communication-oriented software in their classrooms. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.89. Table 13 illustrates the percentages of teachers using other software packages. In particular, 30% or more teachers are using planning, communications (wikis, blogs), and problem solving software several time a week or even daily. However, 50% or more teachers are not using process tools, such as Geometer's Sketchpad or ebooks or podcasts. The results are also shown by discipline and grade level in the Appendix

in Table A4 and Table A5, respectively. Again, the percentages reflect the proportion of teachers either in the discipline or grade level that used the software one or more times a week.

Table 13. Teacher use of other software packages.

Software Type	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Planning	5%	12%	5%	14%	28%	32%
CD reference	7%	22%	24%	16%	17%	10%
Communications: blogging, wiki	7%	31%	13%	12%	13%	22%
Drill/practice/tutorial	7%	30%	23%	13%	15%	12%
Problem-solving	6%	24%	18%	17%	21%	10%
Process tools: Geometer's Sketchpad	11%	57%	14%	7%	6%	4%
Testing	5%	33%	24%	19%	11%	6%
Other: ebook, podcast	11%	52%	20%	6%	7%	3%

In investigating teacher use of digital production software, results indicate much less use by teachers involved in the *Leveraging Laptops* project. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.93. Table 14 shows the teachers use of digital production software. Forty percent or more teachers involved with the *Leveraging Laptops* project do not use digital audio, digital video, podcasting, or digital storytelling software at all. Graphic organizer software is used much more frequently than the other types of software in this category. The results are also shown by discipline and grade level in the Appendix in Table A6 and Table A7, respectively. Again, the percentages reflect the proportion of teachers either in the discipline or grade level that used the software one or more times a week.

Table 14. Teacher use of digital production software.

Software Type	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Digital audio	10%	41%	26%	11%	7%	4%
Digital video	10%	43%	29%	6%	7%	3%
Graphic organizers	7%	28%	29%	18%	13%	4%
Podcasting	11%	54%	20%	8%	4%	2%
Digital storytelling	11%	61%	20%	3%	3%	1%

Student Use of Software

The final domain investigated by the online survey involved student use of a variety of software packages. Analogous to the teacher software use items, the first item explored productivity software use. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.95. Surprisingly, 60% or more teachers report students are using spreadsheets, database, draw/paint/graphics, presentation, authoring, and concept mapping software once a month or less, or not at all. Teachers report students use Internet browsing (39.01%) and word processing (28.57%) software a little more frequently, either everyday or several times a week. Table 15 illustrates the proportion of student use of productivity software. There is a positive correlation between student use and teacher use of this type of software (r=.403, p < .001).

Table 15. Student use of productivity software packages.

Software category	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Word processing	9%	19%	22%	19%	21%	8%
Spreadsheet	14%	52%	23%	5%	2%	1%
Database	14%	53%	18%	5%	3%	2%
Draw/paint/graphics	13%	32%	26%	14%	11%	2%
Presentation	10%	25%	38%	13%	8%	1%
Authoring	17%	41%	20%	10%	7%	1%
Concept mapping	12%	41%	25%	11%	6%	1%
Internet browser	8%	14%	21%	15%	24%	15%

Following a similar strategy used on teacher use and to gain more insight, student use of productivity software packages was also examined by discipline and grade level. Table A8 in the Appendix illustrates teacher use of software by discipline. The percentages reflect the number of teachers within the discipline that responded that they used the software used at least once a week. Results by grade level are shown in the Appendix in Table A9.

Other types of software packages have a similar pattern in the frequency of use according to the teachers involved with the *Leveraging Laptops* project as shown in Table A9. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.95. Fifty percent or more teachers report students use of the following type of software once a month or not at all: planning, CD reference, communications, process tools, testing, ebooks or podcasts. Problem-solving and drill/practice/tutorials have more frequent use with 45% or more teachers reporting students use this type of software at least once a week. There is a strong positive correlation between student use and teacher use of this type of software (r=.605, p < .001). The results are also shown by discipline and grade level in the Appendix in Table A10 and Table A11, respectively.

Table 16. Student use of other software packages.

Software Type	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Planning	2%	19%	50%	14%	10%	4%
CD reference	2%	16%	47%	19%	7%	7%
Communications: blogging, wiki	2%	16%	57%	11%	7%	4%
Drill/practice/tutorial	10%	10%	30%	16%	15%	17%
Problem-solving	5%	11%	33%	18%	16%	14%
Process tools: Geometer's Sketchpad	0%	18%	58%	12%	5%	4%
Testing	3%	12%	39%	20%	15%	9%
Other: ebook, podcast	1%	19%	57%	13%	4%	4%

Student use of digital production tools was also investigated and the results are shown in Table 17. The Cronbach's alpha for this item demonstrates acceptable internal consistency reliability at α=.96. These types

of software utilities were used much less frequently by students according to teachers involved with the *Leveraging Laptops* project. Sixty percent or more teachers reported that students used the software less than once a month or not at all for all software applications in this section. Fifty percent or more of the teachers reported that the software was never used by students in their schools with exception of graphic organizer software packages. There is also a strong positive correlation between student use and teacher use of this type of software (r=.651, p < .001). The results are also shown by discipline and grade level in the Appendix in Table A12 and Table A13, respectively.

Table 17. Student use of digital production software.

Software Type	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
Digital audio	17%	54%	17%	5%	4%	1%
Digital video	17%	57%	16%	5%	2%	1%
Graphic organizers	13%	42%	21%	12%	8%	1%
Podcasting	16%	57%	16%	5%	1%	2%
Digital storytelling	17%	62%	13%	3%	2%	0%

SCHOOL OBSERVATION

Data Collection

The overall purposes of the school observation component of the *Leveraging Laptops* research were: (a) to provide evidence of EETT program implementation progress as demonstrated through classroom practices and (b) to provide formative evaluation data of classroom practices as a basis for guiding improvement planning at state and district levels.

This research component involved direct classroom observation of approximately 430 teachers from 46 schools in the eleven EETT funded districts. There was a wide range of teachers per district: one district included 11 teachers in this program while another included 128, for example. The number of schools within each district ranged from one in Miami-Dade to eight in Lake.

The school observation component involved two areas of focus: District-Level and Program-Level. Both designs examined data from baseline (fall 2006) and end-of-year (late spring 2007) direct classroom observations. The District-Level design focused on all EETT-funded schools within each of the eleven districts. The Program-Level design examined all 46 EETT-funded schools across the districts.

Two data collection instruments were used to conduct direct classroom observations of EETT classes, the School Observation Measure and the Survey of Computer Use. Both instruments are key components of the Formative Evaluation Process for School Improvement (FEPSI) developed by the Center for Research in Educational Policy (CREP) at the University of Memphis, thus are fully developed and validated. A description of the instruments and data collection procedures follows.

School Observation Measure (SOM)

The SOM© was developed to determine the extent to which different common and alternative teaching practices are used throughout an entire school or in targeted classrooms (Ross, Smith, & Alberg, 1999). The instructional strategies include both 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 policymakers, 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).

Key SOM strategies of importance to this research are those recommended as research-based best practices for enhancing learning through student use of technology as a tool to solve authentic problems. These strategies are: cooperative/collaborative learning, higher level instructional feedback (written or verbal) to enhance student learning; project-based learning; use of higher-level questioning strategies; teacher acting as a coach/facilitator; experiential, hands-on learning; independent inquiry/research on the part of students; student discussion; and technology as a learning tool or resource (e.g. Internet research, spreadsheet or database creation, development of multimedia products).

The standard, multi-class SOM© procedure involved observers' visiting 10-12 randomly selected classrooms, for 15 minutes each, during a three-hour visitation period. The observer examined classroom events and activities descriptively, not judgmentally. Notes were taken relative to the use or nonuse of 24 instructional strategies in each of the classrooms. At the conclusion of the three-hour visit, the observer

summarized the frequency with which each of the strategies was observed across all classes in general on the SOM Data Summary Form. The frequency was recorded via a 5-point rubric that ranged from (0) Not Observed to (4) Extensively. Two global items used the same 5-point scale to rate, respectively, the frequency with which high academically-focused instructional time and high student attention and interest were observed.

A targeted as compared to a multi-class procedure involved an observer visiting one classroom to observe the implementation of a full lesson, which typically ran from 45 to 90 minutes in length. The classroom was randomly selected by CREP from all eligible classrooms at a school, e.g., teachers who had completed the required summer 2006 professional development institute. Targeted observations could be prescheduled, where the teacher knew the date and time of the observation or could occur randomly, where the teacher was unaware of the exact day and time of the visit. As with the multi-class observation, notes were taken relative to the use or nonuse of 24 classroom strategies and recorded on a SOM Notes Form every 15 minutes. At the conclusion of the visit, the observer summarized the frequency with which each of the strategies was observed during the lesson on a SOM Data Summary Form. Both multi-class and targeted observations were employed for this study.

To ensure the reliability of data, observers received a manual providing definitions of terms, examples and explanations of the target strategies, and a description of procedures for completing the instrument. After receiving the manual and instruction in a group session, each observer participated in sufficient practice exercises to ensure that his/her data are comparable with those of experienced observers. In a 1999 reliability study reported by Lewis, Ross, and Alberg, pairs of trained observers selected the identical overall response on the five-category rubric on 67 percent of the items and were within one category on 95 percent of the items. A more recent reliability study (Sterbinsky & Burke, 2004) found similar results in that observer ratings were within one category for 96% of the whole-school observations and for 91 percent of the targeted observations.

Survey of Computer Use (SCU)

A companion instrument to SOM that was used in this evaluation is the Survey of Computer Use (SCU) (Lowther & Ross, 2001). The SCU was completed as part of the multi-class and targeted observation sessions, where SCU data were recorded in 15-minute intervals and then summarized on a SCU Data Summary Form.

The SCU was designed to capture exclusively student access to, ability with, and use of computers rather than teacher use of technology. Therefore, four primary types of data were recorded: (a) computer capacity and currency, (b) configuration, (c) student computer ability and (b) 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 is 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 are computer literate (e.g., easily used software features/menus, saved or printed documents), and the number of students who easily used the keyboard to enter text or numerical information.

The next section of the SCU focuses on student use of computers with regard to: the types of activities, subject areas of activities, and 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., html), 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, lists, chat rooms). The Educational Software also has three types of software: drill/practice/tutorial, problem-solving (e.g., Oregon Trail ™) and process tools (e.g., Author's Toolkit ™). The final group of computer activities includes two types of Testing Software: individualized or tracked (e.g., Accelerated Reader) and generic testing that does not maintain records of individual student progress. With this type of recording system, several activities could be noted during the observation of one student working on a computer. This section ends by identifying the subject area of each computer activity. The categories include: language arts, mathematics, science, social studies, and other. The computer activities and software being used were summarized and recorded using a five-point rubric that ranges from (0) Not Observed to (4) Extensively observed.

The final section of the SCU 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: 4 - Very meaningful, 3 – Meaningful, 2 – Somewhat meaningful, 1 – Low level use of computers. Reliability data for the SCU (Sterbinsky & Burke, 2004) show that observer ratings were within one category for 97% of the whole-school observations and for 91% of the targeted observations.

Direct classroom observations were conducted to examine baseline and end-of-year instructional practices of EETT teachers. The instructional practices were coded using the School Observation Measure (SOM) and Survey of Computer Use (SCU). Trained, unbiased observers conducted direct multi-class and/or targeted observations of each EETT classroom at the participating schools. The multi-class observations were unscheduled three-hour visits in which approximately ten classrooms were randomly visited for 15 minutes each. Targeted observations examined classroom instruction during prearranged 45- to 90-minute sessions in which randomly selected EETT teachers were asked implement a prepared lesson that integrated the use of laptops.

Data Analyses

The Mantel-Haentzel procedure was used to infer statistical differences between the pre- and post-classroom observations. Two statistics, QSMH and QCSMH, were reported. The statistic QSMH was used to measure the trend (e.g., increase or decrease) in the value of responses between observations, while QCSMH was used to detect whether the mean responses were the same across the measurement time points (pre = Fall and post = Spring). As data from both SOM and SCU are complete (i.e., without missing values), the QSMH and QCSMH outcomes are identical in value (see Tables 2, 3 and 4). For multiple comparisons, the Bonferroni adjustment was used on the alpha level to control the experimental-wise error. However, because of the strictness of the Bonferroni adjustment, observations that approached the adjusted significance level were also reported. Effect sizes were computed by dividing the mean difference by the pooled standard deviation. Except where noted, a positive sign before the effect size is indicative of outcomes favoring the spring (post) over the fall (pre) observation results, while a negative sign reveals that the fall had higher ratings than the spring.

Results

A total of 381 hours of direct classroom observations were conducted in the classrooms of 428 teachers teaching approximately 8500 students. Of the 41 schools that participated, 12 were elementary schools, 17 were middle schools, and 12 were high schools. A potential source of bias may be observer involvement in the Florida EETT program.

Both the SOM and SCU Multi-Class and Targeted observations revealed significant Fall to Spring differences in the use of teacher-centered practices, as shown in the following tables and Appendices B and C. For the SOM, significant increases were found using both the Multi-Class and Targeted observations in student engagement in "project-based learning," "independent inquiry/research," and student use of "technology as a learning tool or resource." The SCU results from both Multi-Class and Targeted observations yielded significant increases in students' overall use of newer and more up-to date computers (laptops) and positive trends toward increased uses of production tools and internet/research tools to support learning. A key finding that emerged from the results was the significant increase in the frequency with which teachers implemented meaningful computer activities that engaged students in higher-order thinking and problem-solving through effective use of laptop-based technology tools.

These first-year results show promising trends in that the Florida EETT program seems to be serving as a catalyst for positive changes from traditional teaching environments to ones that are student-centered and engage learners in meaningful use of computers to enhance learning. The data also reveal room for growth due to the modest frequency with which most of the changed practices occurred.

The following sections summarize the results by observation and instrument type, and they compare Florida's results to national norms. More detailed results tables are located in Appendices B and C.

Multi-Class SOM Results

The SOM results from the fall and spring observations revealed changes in teaching strategies as well as student activities (see Table C1). Overall, the greatest fall (baseline) to spring differences were seen in increased "High student attention, interest, and engagement" (Fall M = 2.18, Spring M = 2.91, ES = +1.00) and a decrease in the use of traditional "Independent seatwork" (Fall M = 2.68, Spring M = 1.69, ES = -1.00). Other notable differences include greater use of "Project-based learning" (ES = + 0.93), "Teacher acting as coach/facilitator" (ES = + 0.78), "Cooperative/Collaborative learning" (ES = + 0.62), "Independent inquiry/research" (ES = + 0.63), and "High academically focused class time" (ES = + 0.61), consistent with a decline in the use of "Direct instruction" (Fall M = 2.91, Spring M = 2.19, ES= -0.82). Of particular interest are the positive changes in computer use. While use of "Computers as a delivery tool" (a teacher-centered activity) showed a decrease (ES= -.40), student use of "Technology as a learning tool" (student-centered) showed an impressive increase. (ES=+.61)

SOM Multi-Class Inferential Analyses

As previously mentioned, there are a total of 26 items on the SOM, which are evaluated using an ordinal 5-point Likert scale that ranges from "0 = Not observed" to "4 = Extensively". The SOM multi-class inferential analysis outcomes are presented in Table C2 in the Appendix and Figure 1. The FL EETT classrooms that were observed had significant increases on four SOM items: (1) "Project-based learning" ($p<.001$), (2) "Independent inquiry/research on the part of students" ($p=.001$), (3) "Technology as a learning tool or resource" ($p<.001$), and (4) "High level of student attention/interest/engagement" ($p<.001$), and significant

decreases in "Direct instruction" (p=.001) and "Independent seatwork" (p<.001). In addition, two items, (1) "Teacher acting as a coach/facilitator" (p=.0021) and (2) "High academically focused class time" (p=.0021), approached significance with large associated effect sizes.

	High Student Attention	Technology as a Learning Tool	Project-based Learning	Independent Research	Direct Instruction	Independent Seatwork
Fall	2.19	1.35	0.59	0.76	2.91	2.68
Spring	2.91	2.15	1.56	1.43	2.19	1.69
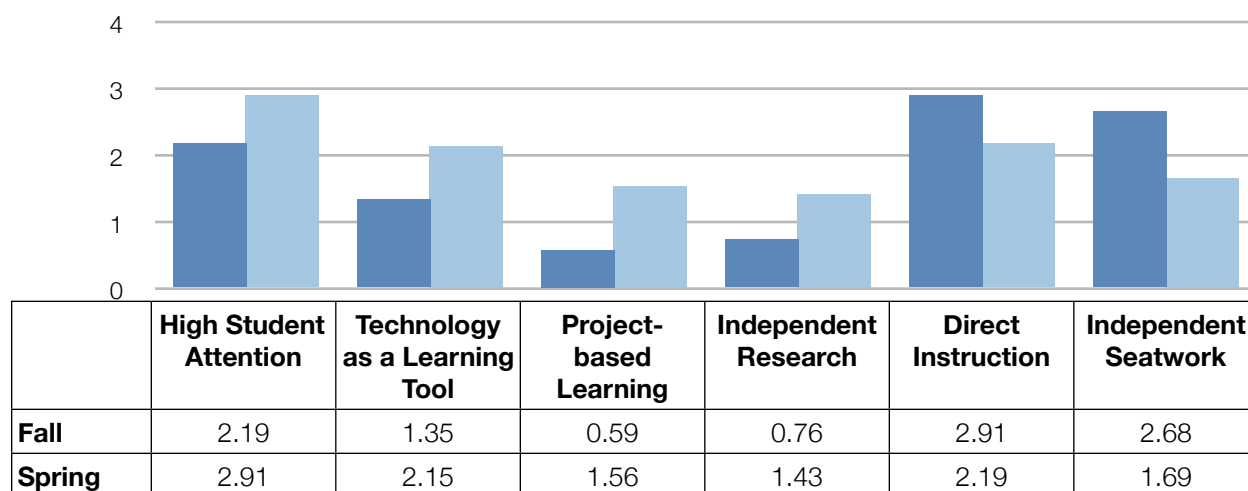
Figure 1. Multi-Class SOM: Significant Fall vs. Spring Differences

Multi-Class SCU Results

As seen in Table C3 in the Appendix, the number of classrooms with "11 or more" computers available for student use increased from 57.1% in the fall to 72.2% in the spring, with 98.1% of the computers observed in the spring considered as "Up-to-date". There was also an increase (Fall = 28.6%; Spring = 51.9%) in the percentage of classrooms in which the laptops were used by "nearly all" of the students, as well as an increase in the percentage of students rated with "very good" computer literacy skills (Fall = 31.4%; Spring = 46.3%) and keyboarding skills (Fall = 14.3%; Spring = 35.2%). As would be expected, there was a decrease in the percentage of classrooms in which desktop computers were "Frequently" to "Extensively" observed (Fall = 17.2%; Spring = 8.6%), while laptop availability increased (Fall = 37.2%; Spring = 74.1%).

Students were observed using a variety of computer applications during the multi-class visits, with notable increased usage of three key tools from fall to spring. Specifically, the greatest increase was seen in student use of "Internet Browsers" (Fall M = 1.23, Spring M = 2.17; ES = +0.80). Students also more frequently used "Draw, paint, and/or graphics" software (ES = +0.70) and "Presentation" software (ES = +0.58). The most frequently observed subject area of the computer activities was language arts, which was seen during 74.1% of the "Production tool" use and 59.3% of the "Internet/Research tool" use.

Meaningfulness of Computer Activities.

The data revealed very positive trends with the largest gain was seen in the category "Meaningful use of computers" (Fall M = 0.94, Spring M = 1.87, ES = +0.83), which is defined as, "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." Additionally it should be noted that this category was observed Extensively to Occasionally in 59.3% of the spring multi-class visits. "Very meaningful use of computers" also had a substantial gain (Fall M = 0.31, Spring M = 1.11, ES = +0.77). Conversely, a large drop was seen in "Low level Use of Computers" (Fall M = 1.17, Spring M = 0.78, ES = -0.36), defined as "activities in general required no critical thinking, e.g., used computer applications for

copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games", as it was only seen "Frequently" to "Extensively" in 5.6% of the spring visits.

SCU Multi-Class Inferential Statistics

The Survey of Computer Use (SCU) observations are organized into 8 categories: "Computer Configuration", "Computer Use", "Frequency of Computer Type Use", "Production Tools Used", "Internet/Research Tools Used", "Educational Software Used", "Testing Software", and "Overall Meaningful Use of Computers". All rating categories with the exception of items under "Computer Configuration" and "Computer Use" are measured using a 5-point Likert scale (0=Not Observed, 1=Rarely, 2=Occasionally, 3=Frequently, and 4=Extensively). As a result, all SCU observations except "Computer Configuration" and "Computer Use" were analyzed using an adjusted alpha with Bonferroni correction, whereas the items under the first two categories were assessed using the normal alpha level (0.05). The SCU observation analyses outcomes are presented in QSMH and QCSMH statistics in Table C4. The following SCU Multi-Class categories had significant findings: Computer Configuration, Digital Devices Available for Students, Student Computer Activities, and Overall Meaningful Use of Computers. Details of these differences are below.

Computer Configuration.

A larger number of computers or digital tools were observed during the spring observations as compared to the fall observations (QSMH =QCSMH=4.263, p=.039). Classroom computers observed during spring visits were also better equipped (more up-to-date) (QSMH=QCSMH=5.452, p=.020). Attention should be paid when interpreting the effect size associated with this item (i.e., negative as better) because of descending order of the rating scale (1 = up-to-date, 2 = Aging but adequate, 3 = Outdated/limited capacity, and 4 = No computers were observed). Spring observations found significantly fewer classrooms without students using computers (QSMH =QCSMH=10.028, p=.002). Once again, please note that the negative effect size is actually positive feedback on the spring over the fall results.

Digital Devices Available for Student Use.

There was significantly more Laptop computer usage during spring observations (QSMH =QCSMH=14.612, p<.001). Use of "Digital Accessories" (QSMH =QCSMH= 9.131, p=.0025) approached significance with an adjusted alpha of 0.0017, with more usage during the spring as compared to the fall visits.

Student Computer Activities.

Under "Internet/Research Tools Used by Students", "Internet Browser" (QSMH=QCSMH=9.192, p<.0024) also approached significance with an adjusted alpha of 0.0017, meaning students usage of the Internet was more frequent during spring vs. fall observations.

Overall Meaningful Use of Computers.

When examining the meaningfulness of computer activities that were observed during the fall observations as compared to those seen during spring observations, two positive significant differences were revealed (see Figure 2). Specifically, "Meaningful use of computers" (QSMH =QCSMH=10.780, p=.001), and "Very meaningful use of computers" (QSMH=QCSMH=10.712, p=.001) were observed significantly more during the spring observations.

	Meaningful Computer Use	Very Meaningful Computer Use
Fall	0.94	0.31
Spring	1.87	1.11
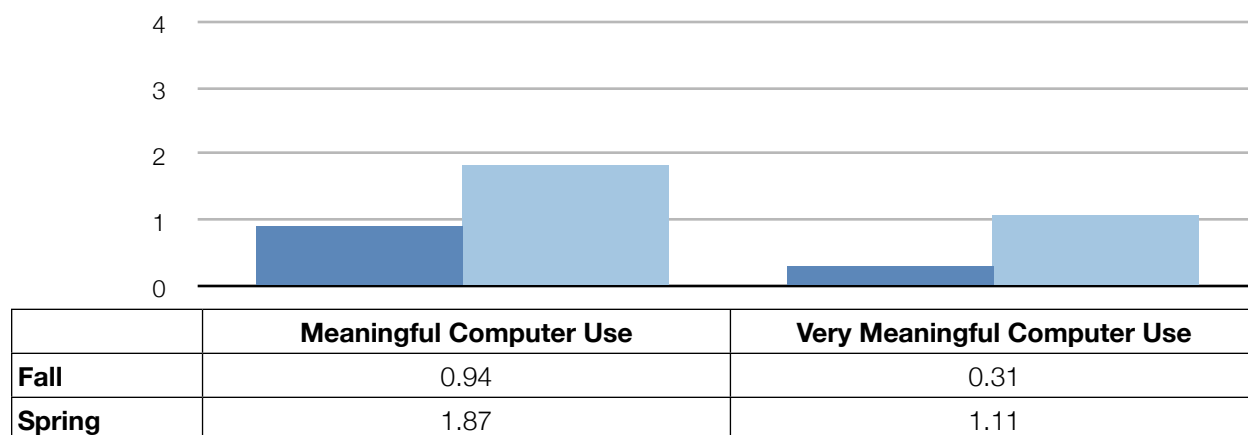
Figure 2. Multi-Class SCU: Mean Scores of Significant Fall vs. Spring Differences in Meaningful use of Computers

Targeted SOM Results

The targeted SOM results revealed positive fall to spring increased usage of student-centered classroom practices (see Table C5 in the Appendix). The most notable increase, as indicated by an Effect Size of +0.93, was in student engagement in "Project based learning" (Fall M = 0.58, Spring M = 1.97). Other striking increases included more "Integration of subject areas" (ES = +0.87), "Teachers acting as coach/facilitators" (ES = +0.69), "Independent inquiry/research on the part of students" (ES = +0.58), "Cooperative/collaborative learning" (ES = +0.58), and "Sustained writing" (ES = +0.55). Additionally, the context for technology use shifted, with student use of "Technology as a learning tool/resource" increasing (Fall M = 1.97, Spring M = 2.95, ES = +0.60) and "Technology as a delivery tool" decreasing (Fall M = 2.37, Spring M = 1.58, ES = -0.48).

Overall, "High academically focused class time" was observed frequently to extensively in approximately 70% of the classrooms during both the fall and spring semesters. However, there was an increase in the frequency with which a "High level of student attention, interest, and engagement" was seen in the spring as compared to the fall observations (Fall M = 2.66, Spring M = 3.12, ES = +0.38).

SOM Targeted Inferential Statistics

As shown in Table C6, a significant upward trend between observations was found on five SOM items: (1) "Integration of subject areas" (p<.001), (2) "Project-based learning" (p<.001), (3) "Teacher acting as a coach/facilitator" (p=.001), (4) "Independent inquiry/research on the part of students" (p<.001), and (5) "Technology as a learning tool or resource" (p=.001), meaning significantly more activities in these five areas were observed during spring observations compared to those conducted in the fall.

As revealed by QCSMH and its associated p-value, these five areas also had significantly higher mean responses at the spring observation (see Table C6 and Figure 3). In particular, the associated effect sizes (ranging from .58 to .93) are substantially large. An additional three SOM items approached significance with moderate to substantial effect sizes. They are "Cooperative/collaborative learning" (p=.005), "Higher-level instructional feedback to enhance student learning" (p=.002), and "Use of higher-level questioning strategies" (p=.005).

	Technology as a Learning Tool	Teacher as Facilitator	Independent Research	Project-based Learning	Integration of Subjects
Fall	1.97	1.68	1.11	0.58	0.24
Spring	2.95	2.58	2.04	1.97	1.33
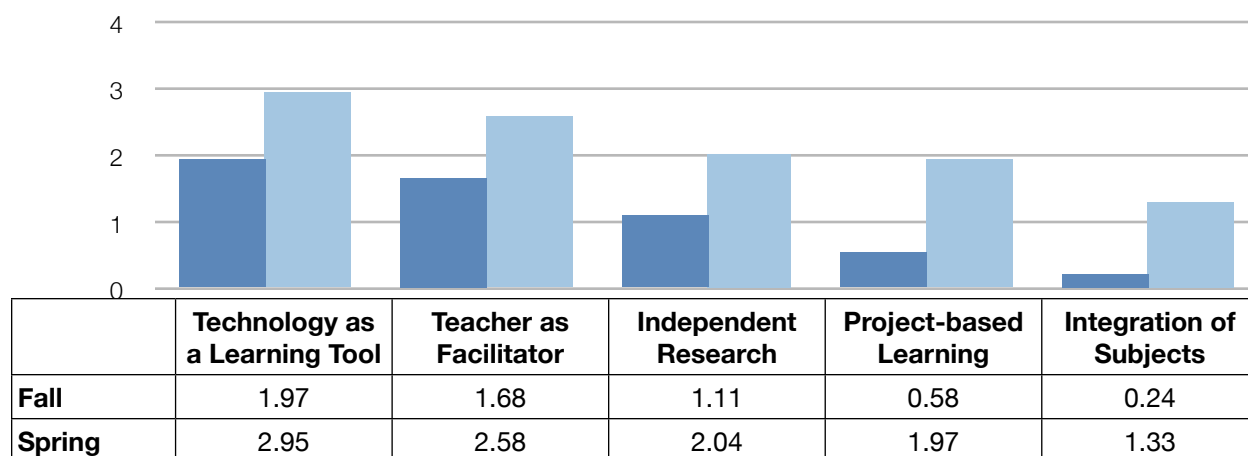
Figure 3. Targeted SOM: Significant Fall vs. Spring Differences

Targeted SCU Results

Following the same trend as seen in the Multi-class results, the number of classrooms with "11 or more" computers available for student use increased from 64.9% in the fall to 87.1% in the spring, with nearly all (98.6%) considered as "Up-to-date" in the spring (see Table C7 in the Appendix). There was also an increase (Fall = 62.2%; Spring = 71.4%) in the percentage of classrooms in which the laptops were used by "nearly all" of the students, as well as an increase in the percentage of students rated with "very good" computer literacy skills (Fall = 18.9%; Spring = 55.7%) and keyboarding skills (Fall = 16.2%; Spring = 35.7%). The results revealed that during the fall and spring, students more frequently worked alone when using the laptop (Fall = 70.3%; Spring = 71.4%), however, there was a fall to spring increase in the frequency with which students worked in pairs during laptop use (Fall = 10.8%; Spring = 22.9%).

Also following the same pattern of progress as the Multi-class results, the greatest fall to spring increase was in student use of the Internet, which was seen "Frequently" to "Extensively" in over one-half (55.7%) of the spring observations as compared to less than one-fourth (21.6%) of the fall observations. This gain yielded an impressive Effect Size of +0.64. Other striking increases were in student use of "Presentation" software (Fall M = 0.43, Spring M = 1.43, ES = +0.73) and "Other" types of "Production Tools" (Fall M = 0.11, Spring M = 0.81, ES = +0.67). Listed examples of these tools included Puzzle Maker, PhotoShop and Note Taker. Spring observations revealed that student use of "Production Tools" and "Internet/Research Tools" were most often associated with Language Arts (Production Tools = 44.3%, Internet/Research Tools = 35.7%) and Science (Production Tools = 38.6%, Internet/Research Tools = 31.4%).

Although the targeted results are positive, it should be noted that although students were observed using 18 of the 20 computer applications listed on the SCU, the majority of the tools were used infrequently as seen in Mean scores for all but 3 of 18 uses that were at or below 1.00, which equals "Rarely" observed. This finding indicates that teachers had taken important first steps in integrating more technology into their teaching during the short timeframe of this study, but there is still much room for growth.

Meaningfulness of Computer Activities. Significant positive gains were seen from fall to spring regarding the meaningfulness of computer activities that were implemented during the targeted observations (see Table C7). Specifically, "Meaningful use of Computers" defined as "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" increased from a Mean of 0.97 in the fall to

1.94 in the spring (ES = +0.64). Encouragingly, the teachers demonstrated increased ability to implement lessons that engaged students in "Very meaningful use of computers" in which "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" (Fall M = 0.57, Spring M = 1.27, ES = +0.49). Just as the "meaningfulness" of computer activities was observed to increase, the occurrence of "Low level use of computers" (activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games) showed a fall to spring decrease (Fall M = 1.00, Spring M = 0.54, ES = -0.39).

SCU Targeted Inferential Statistics

The SCU Targeted observation analyses outcomes are presented in QSMH and QCSMH statistics in Table C8 of the Appendix and Figure 4. The following SCU categories had significant findings: Computer Configuration, Student Computer Activities, and Overall Meaningful Use of Computers. Details of these differences are below.

Computer Configuration. As with the Multi-class observations, there were significantly more computers or digital tools observed in use during the spring observations as compared to the fall observations (QSMH =QCSMH = 10.119, p = .0015). Classroom computers observed during spring visits were newer and more up-to-date) (QSMH=QCSMH = 8.487, p = .004). Again, attention should be paid when interpreting the effect size of this SCU item. As the ratings were arranged in descending order (1=up-to-date, 2=Aging but adequate, 3=Outdated/limited capacity, and 4=No computers were observed), the effect size should be interpreted in the opposite direction, with a negative sign indicating a more positive rating in the observation. Spring observations revealed more classroom computers connected to the Internet as compared to the fall (QSMH =QCSMH = 5.744, p = .017). The ratings for this SCU item are: 1=connected to the Internet, 2=Not connected to the Internet, and 3=No computers were observed. Thus, as noted above, special attention should be made to interpret the effect size.

Student Computer Activities. Using an adjusted alpha of 0.0017 to examine "Production Tools Used by Students", the analysis revealed that students were found to have significantly increased use of "Other production tools" (QSMH =QCSMH = 14.781, p < .001). As noted earlier, examples of these tools included Puzzle Maker, PhotoShop, and Note Taker.

Overall Meaningful Use of Computers. When examining the meaningfulness of computer activities that were observed during the fall Targeted observations as compared to those seen during spring observations, one significant difference was revealed (see Table C8). Specifically, using an adjusted alpha of 0.0017, students were found to have significantly increased "Meaningful use of computers" (QSMH =QCSMH=13.384, p<. 001) during the spring observations.

	Meaningful Computer Use	Production Tools (Other)
Fall	0.97	0.11
Spring	1.94	0.81
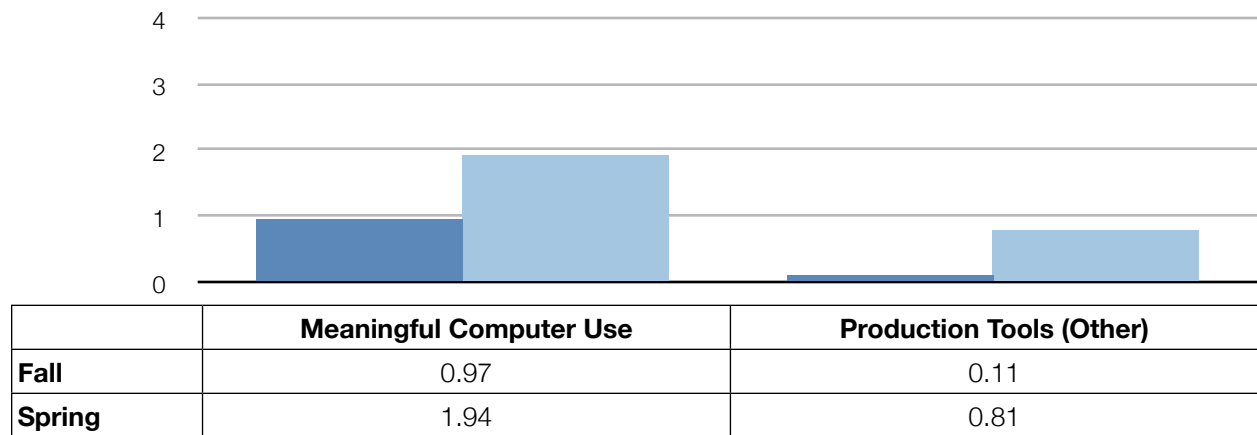
Figure 4. Target SCU: Mean Scores of Significant Fall vs. Spring Differences

Teacher Action Research

Introduction

Teacher action research (AR), also known as teacher inquiry, is a strategy for helping educators through a systematic, intentional study of their own professional practice (Cochran-Smith & Lytle, 1993; N. Dana & Silva, 2000; Hubbard & Power, 1993). In general, action research engages teachers in the design, data collection, and interpretation of data around their questions. The process of teacher inquiry involves teachers (1) defining a question that emerges from their practice, (2) developing a research plan for data collection through such mechanisms as journals, student work, interviews with students, and field notes, (3) analyzing their collective data in relationship to their wondering to develop a picture of their learning, (4) taking action to implement what was learned through their investigation, and (5) sharing the results of their work with other professionals (Dana & Yendol-Silva, 2003).

Action research was selected as the strategy for assessing student learning during the *Leveraging Laptops* initiative because of the short time frame of our research, the inherent problems using standardized test data to document the effect of technology use (Means, 2004) and the importance of documenting classroom-based student achievement (Dawson & Ferdig, 2006).

District project coordinators and action research mentors attended a Fall 2006 seminar to introduce them to the roles and responsibilities of the AR mentor. The seminar presentation is included in the Appendix. After the seminar, 46 teachers from ten of the eleven districts then completed action research in their classrooms with the guidance of an AR Mentor who was assigned to each district.

Each AR Teacher and AR Mentor received a copy of "The Reflective Educator's Guide to Classroom Research" (Dana & Yendol-Hoppey, 2003) and guidelines for completing the AR process. Table 18 overviews and describes each step in the process and provides an example of what the result of each step may look like.

Table 18. Action research steps

Step	Description	Example
Step 1: Identify an AR Inquiry:	– AR teachers will specify a question related to how their laptop efforts influence student learning. This question could relate to a single lesson, a unit, a project-based activity, use of a particular simulation or strategy, etc. This question could also relate to a whole class, specific group or individual child.	– Will a project-based learning activity designed to facilitate 5th grade students' understanding of the plants and animals on their school campus support learning at various levels of Bloom's taxonomy?

Step	Description	Example
Step 2: Specify context	– AR teachers will provide contextual information	– Grade level(s): 5th Grade – Content area(s): Science – SSS: The student describes patterns of structure and function in living things. – Technology configuration: Small group – Years of teaching experience: 10 – Years experience teaching with technology: 3
Step 3: Data Collection	– AR teacher will specify strategies to best answer their question	– Digital photographs – Student Artifacts – Informal Interviews – Reflective Journal
Step 4: Data Analysis	– AR teachers take information collected, synthesize it and answer question	– Finding 1: Sophistication of student knowledge increased as students progressed through stages of project development.
Step 5: Implications/ Actions	– AR teachers think about broader implications of their findings & describe what actions have or will result from their AR efforts	– Laptops provide opportunities for project-based learning activities that help foster higher level thinking skills. – I am planning a workshop for my colleagues on the use of project-based in Science. – My principal is funding me to attend a conference related to science and technology.

Data Collection and Results

An online AR submission system, shown in the figure below, was developed in order to facilitate data collection. This system provided information about each of the steps in the AR Process and directions for how to submit work for each step. It allowed evaluators to easily compile results while minimizing the amount of effort required on the part of AR Teachers and Mentors.

Of the completed Action Research projects submitted, 9 projects were conducted in elementary classrooms (grades 1-5), 22 took place in middle school classrooms (grades 6-8), and 15 were carried out in high school classrooms (grades 9-12). Eighteen of the projects focused on a science topic, eleven centered on an English/

language arts topic, six were oriented toward history or social studies, four focused on mathematics, four on speech or other exceptional education setting, and three studied general student outcomes or behavior.

The technologies used in the projects varied, and are listed by frequency in Table 19. About one-third of the projects used online services and resources, and smaller numbers of projects used other available technology. Ten of the projects focused on project-based approaches.

Table 19. Technologies used in action research projects

Technology	Number of projects (N=46)
Online resources	16
Media and presentation tools	11
Word processing, publishing and other productivity tools	9
Concept mapping software	6
Probes and data tools	6
Virtual labs, simulations, and games	4
Other: audio production, clickers, e-portfolios	4

The educational results reported by the teachers were overwhelmingly positive. Thirty-five of the teachers documented changes in student achievement including test scores, higher level thinking skills, retention, and transfer of learning. In one elementary classroom and two middle school classrooms, negative effects such as a decrease in writing scores and a high level of frustration were reported, and in each case these effects were attributed to inexperience in the students with the technology that they were learning to use simultaneously with learning the class lesson. In all other cases, teachers reported noticeable or significant improvements in student performance, in some cases exceeding the teachers' expectations. Twenty-six of the teachers reported increases in conditions that support learning: enjoyment, motivation, engagement, on-task behavior, and positive school experience. Thirteen teachers stated that students had demonstrated strong 21st Century Skills such as collaboration, computer skills, workforce skills, abilities as producers, communication skills, leadership abilities, innovation and creativity. Smaller numbers of teachers documented positive changes in their teaching, changes in the classroom culture or dynamic due to unique technology affordances, and improved ability to reach students of varying abilities.

Each teacher reported the long-term impacts that the Laptops for Learning program has caused in his or her professional life. Nineteen teachers expressed commitments to continue using, investigating, and learning to teach with technology. Fifteen teachers had taken leadership actions including sharing their successes with colleagues either informally or through presentations and other formal venues. Other teachers explained ways that they had become advocates for technology for students.

A few of the themes that became evident from the AR results were:

- Students need support when simultaneously learning challenging academic concepts and learning technology applications.
- Students need practice with technology and academic skills to become proficient. Access to the technology is essential.

- Student comfort and skill with technology should be scaffolded and strengthened with explicit instruction and practice if students lack home access to computers or previous experience with computers, or if they are struggling learners academically.

- Classroom differentiation appears to be a critical success factor, enabling students to have the levels of social interaction, time and tools that they need.

- Teacher effort and creativity must be invested in order for positive student outcomes with technology to be achieved.

- Student choice seems to increase engagement and motivation.

- Innovation and success develop leadership and initiative in teachers, resulting in grant-seeking, mentoring, and other leadership initiatives.

The AR projects in each district are summarized in the District Profiles located in Appendix D.

Summary Of Findings

The *Leveraging Laptops* funding was intended to positively impact teaching practices and student achievement through professional development, support and access to technology. The preceding sections have addressed this program's evaluation in detail. This section summarizes the most important findings from this evaluation related to (1) Changes in Teaching Practices, (2) Student Achievement and (3) Professional Development.

Changes in Teaching Practices

- Evaluation results show promising trends in that the Florida EETT program seemed to serve as a catalyst for positive changes from traditional teaching environments to ones that are student-centered and engage learners in meaningful use of computers to enhance learning.
    - Significant increases were observed related to:
        - student attention, interest and engagement,
        - project-based learning,
        - teachers acting as facilitators and coaches,
        - cooperative/collaborative learning,
        - independent inquiry/research,
        - academically focused class time,
        - computers used as a learning tool, and
        - using computers to support critical thinking skills.
    - Significant decreases were observed related to:
        - independent seatwork,
        - direct instruction,
        - computers used as a delivery tool, and
        - using the computer to support lower-level thinking.

Student Achievement

- 78% of Action Research teachers documented changes in student achievement including test scores, higher level thinking skills, retention, and transfer of learning.
- Nearly 60% of Action Research teachers documented an increase in conditions that support learning: enjoyment, motivation, engagement, on-task behavior, and positive school experience.
- Students developed 21st Century Skills such as collaboration, computer skills, workforce skills, abilities as producers, communication skills, leadership abilities, innovation and creativity.

Professional Development

- 73% of *Leveraging Laptops* teachers reported their professional development opportunities focus on both technical and instructional skills required to integrate technology.

- Over 50% of *Leveraging Laptops* teachers indicated that their professional development opportunities are consistent and continual.

- Over 70% of the teachers involved with the *Leveraging Laptops* project expressed favorable (strongly agree or agree) attitudes towards their professional development opportunities in terms of:
    - encouraging them to think about how to use technology to support teaching goals (83.24%),
    - encouraging them to collaborate with other colleagues on technology integration (78.57%),
    - encouraging them to thinking about contextual factors that support or hinder technology integration efforts (73%.08),
    - helping them think about how technology may change their teaching practices (85.71%),
    - providing them relevant knowledge and skills for the classroom (74.73%),
    - encouraging them to use technology to facilitate student learning content (84.62%).

- Over 70% of the *Leveraging Laptops* teachers felt adequately supported to use technology in their classroom.

Conclusions

This research effort built upon a philosophy that centered on sharing best practices from each district with the state. A collaborative relationship among participants resulted in access to the data needed to tell the stories of the classrooms and districts. The EETT project represents a foundation from which the State of Florida learned about the key elements that contribute to desirable changes in teaching and learning. Thousands of educators and leaders have worked very hard over a two-year period to plan and implement the 11 district models. The funding made this work possible, but it was the expertise, knowledge, and effort of everyone involved that resulted in the positive outcomes documented in this report. These outcomes can and should continue. Florida's public school students and the citizens of the State have already begun to see the benefits of technology used as a learning tool in the context of student-centered teaching.

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Appendix A. Teacher Survey Data

Table A1. Teacher certification areas.

Florida Teacher Certification	n	%
Professional Education	20	5.5%
Agriculture 6-12	2	0.6%
Art K-12	4	1.1%
Biology 6-12	54	14.8%
Business Education 6-12	14	3.9%
Chemistry 6-12	14	3.9%
Computer Science K-12	4	1.1%
Drama 6-12	2	0.6%
Earth/Space Science 6-12	9	2.5%
Ed. Media Specialist PK-12	12	3.3%
Elementary Education K-6	103	28.3%
English 6-12	42	11.5%
ESOL	36	9.9%
Exceptional Student Ed. K-12	39	10.7%
Family and Consumer Science	1	0.3%
French K-12	0	0.0%
German K-12	0	0.0%
Guidance and Counseling PK-12	2	0.6%
Health K-12	5	1.4%
Hearing Impaired K-12	1	0.3%
Humanities K-12	0	0.0%
Technology Education 6-12	3	0.8%
Journalism 6-12	1	0.3%
General Knowledge	5	1.4%
Latin K-12	0	0.0%
Marketing 6-12	1	0.3%
Mathematics 6-12	29	8.0%
Middle Grades English 5-9	17	4.7%
Middle Grades General Science 5-9	47	12.9%
Middle Grades Integrated Curriculum	16	4.4%
Middle Grades Mathematics 5-9	40	11.0%
Middle Grades Social Science 5-9	14	3.9%
Music K-12	3	0.8%
Physical Education K-12	9	2.5%
Physics 6-12	6	1.7%

Florida Teacher Certification	n	%
Prekindergarten/Primary PK-3	11	3.0%
Preschool Education (Birth-Age 4)	0	0.0%
Reading K-12	13	3.6%
School Psychologist PK-12	0	0.0%
Social Science 6-12	29	8.0%
Spanish K-12	0	0.0%
Speech 6-12	2	0.6%
Speech-Language Impaired K-12	1	0.3%
Visually Impaired K-12	0	0.0%

Table A2. Teacher use of productivity software by discipline.

Discipline	n	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
English	92	40%	36%	38%	40%	88%	71%	46%	89%
Reading	85	42%	46%	49%	55%	88%	74%	44%	91%
Math	116	35%	33%	50%	50%	87%	66%	54%	91%
Science	147	26%	36%	39%	43%	83%	69%	46%	84%
Social Studies	89	44%	44%	46%	57%	93%	76%	49%	94%
Art/Music	8	13%	38%	38%	75%	100%	88%	0%	100%
Physical Education	0	0%	0%	0%	0%	0%	0%	0%	0%
Media/ Technology Specialist	16	44%	38%	69%	63%	94%	75%	56%	88%
Special Education	16	31%	31%	38%	38%	88%	56%	31%	75%
Vocational Education	4	50%	75%	25%	75%	75%	75%	25%	75%
Other	38	32%	42%	47%	42%	95%	66%	61%	97%

Table A3. Teacher use of productivity software by grade level.

Grade	N	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
Pre-K	5	40%	20%	60%	40%	80%	60%	40%	80%
Kindergarten	17	29%	24%	53%	59%	94%	76%	24%	94%
First	20	25%	30%	35%	40%	90%	60%	40%	80%
Second	25	32%	32%	48%	60%	96%	76%	36%	88%
Third	37	35%	38%	41%	51%	89%	68%	43%	86%
Fourth	29	45%	48%	38%	66%	93%	79%	34%	86%
Fifth	23	35%	39%	52%	57%	91%	65%	52%	87%

Grade	N	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
Sixth	90	26%	32%	40%	29%	92%	62%	43%	91%
Seventh	86	24%	24%	42%	30%	86%	64%	52%	87%
Eighth	101	21%	25%	49%	38%	83%	68%	53%	84%
Ninth	55	25%	31%	40%	27%	84%	76%	45%	89%
Tenth	61	30%	36%	41%	34%	80%	70%	51%	84%
Eleventh	57	30%	32%	40%	32%	84%	75%	53%	89%
Twelfth	50	30%	36%	44%	32%	86%	80%	58%	90%
Adult	11	36%	55%	45%	55%	82%	82%	73%	91%

Table A4. Teacher use of other software by discipline.

Discipline	n	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem- solving	Process tools	Testing
English	92	32%	45%	43%	14%	66%	48%	16%	36%
Reading	85	34%	58%	53%	22%	75%	58%	22%	53%
Math	116	47%	55%	54%	18%	78%	61%	26%	50%
Science	147	44%	48%	38%	15%	73%	44%	17%	41%
Social Studies	89	48%	56%	49%	25%	75%	58%	24%	46%
Art/Music	8	63%	63%	50%	50%	100%	75%	0%	13%
Physical Education	0	0%	0%	0%	0%	0%	0%	0%	0%
Media/ Technology Specialist	16	38%	56%	31%	38%	75%	56%	19%	44%
Special Education	16	50%	50%	81%	19%	69%	63%	19%	44%
Vocational Education	4	50%	50%	50%	25%	75%	75%	50%	75%
Other	38	34%	45%	47%	11%	71%	61%	16%	42%

Table A5. Teacher use of other software by grade level.

Grade	N	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem- solving	Process tools	Testing
Pre-K	5	40%	20%	20%	20%	80%	40%	0%	20%
Kindergarten	17	41%	53%	41%	29%	82%	47%	6%	18%
First	20	35%	55%	50%	30%	75%	55%	10%	25%
Second	25	40%	56%	44%	28%	76%	56%	16%	24%
Third	37	38%	57%	59%	24%	73%	54%	14%	38%
Fourth	29	31%	52%	48%	21%	76%	52%	17%	48%
Fifth	23	30%	57%	52%	26%	61%	52%	17%	39%
Sixth	90	47%	44%	40%	17%	73%	47%	21%	39%
Seventh	86	45%	49%	38%	13%	76%	48%	15%	31%

Grade	N	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem-solving	Process tools	Testing
Eighth	101	50%	45%	34%	15%	76%	46%	14%	35%
Ninth	55	47%	45%	35%	9%	78%	42%	16%	35%
Tenth	61	52%	46%	39%	13%	70%	44%	18%	41%
Eleventh	57	54%	47%	28%	9%	74%	46%	16%	33%
Twelfth	50	56%	44%	28%	8%	76%	46%	18%	38%
Adult	11	55%	27%	45%	27%	73%	55%	27%	27%

Table A6. Teacher use of digital production software by discipline.

Discipline	n	Digital audio	Digital storytelling	Digital video	Graphic organizers	Podcasting
English	92	21%	5%	17%	42%	12%
Reading	85	26%	11%	21%	51%	15%
Math	116	17%	9%	19%	34%	13%
Science	147	20%	7%	16%	39%	12%
Social Studies	89	30%	10%	25%	52%	17%
Art/Music	8	13%	0%	38%	38%	38%
Physical Education	0	0%	0%	0%	0%	0%
Media/ Technology Specialist	16	25%	13%	19%	38%	31%
Special Education	16	38%	6%	25%	25%	19%
Vocational Education	4	50%	25%	50%	75%	25%
Other	38	34%	11%	16%	50%	16%

Table A7. Teacher use of digital production software by grade level.

Grade	N	Digital audio	Digital storytelling	Digital video	Graphic organizers	Podcasting
Pre-K	5	20%	0%	0%	40%	20%
Kindergarten	17	12%	12%	18%	29%	24%
First	20	25%	10%	25%	30%	25%
Second	25	20%	8%	20%	36%	28%
Third	37	30%	8%	19%	43%	30%
Fourth	29	24%	7%	21%	41%	17%
Fifth	23	17%	4%	22%	26%	22%
Sixth	90	20%	8%	16%	33%	18%
Seventh	86	14%	8%	19%	28%	17%

Grade	N	Digital audio	Digital storytelling	Digital video	Graphic organizers	Podcasting
Eighth	101	17%	6%	15%	31%	13%
Ninth	55	27%	4%	20%	27%	2%
Tenth	61	26%	3%	15%	31%	3%
Eleventh	57	23%	2%	9%	32%	2%
Twelfth	50	26%	2%	16%	36%	2%
Adult	11	36%	18%	18%	64%	18%

Table A8. Student use of productivity software by discipline.

Discipline	n	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
English	92	29%	15%	11%	30%	55%	18%	3%	54%
Reading	85	33%	29%	15%	42%	67%	29%	5%	64%
Math	116	21%	18%	10%	30%	55%	20%	11%	47%
Science	147	19%	21%	7%	28%	52%	22%	5%	48%
Social Studies	89	33%	31%	15%	46%	71%	34%	9%	70%
Art/Music	8	0%	13%	0%	13%	38%	0%	0%	25%
Physical Education	0	0%	0%	0%	0%	0%	0%	0%	0%
Media/ Technology Specialist	16	25%	25%	19%	63%	75%	50%	13%	69%
Special Education	16	25%	38%	13%	38%	69%	38%	0%	50%
Vocational Education	4	50%	50%	25%	75%	75%	75%	25%	75%
Other	38	24%	32%	5%	37%	-	24%	8%	66%

Table A9. Student use of productivity software by grade level.

Grade	N	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
Pre-K	5	20%	20%	0%	40%	20%	20%	0%	40%
Kindergarten	17	6%	18%	0%	29%	41%	6%	0%	29%
First	20	15%	30%	0%	30%	45%	15%	0%	40%
Second	25	28%	24%	4%	40%	56%	20%	0%	52%
Third	37	16%	27%	8%	27%	62%	19%	0%	51%
Fourth	29	31%	45%	7%	41%	69%	31%	0%	59%
Fifth	23	22%	39%	17%	35%	65%	26%	4%	57%
Sixth	90	16%	20%	16%	19%	53%	26%	11%	46%
Seventh	86	12%	12%	14%	16%	41%	20%	9%	34%
Eighth	101	14%	13%	14%	23%	45%	21%	8%	41%
Ninth	55	11%	13%	13%	35%	56%	29%	11%	47%
Tenth	61	15%	18%	8%	31%	61%	26%	8%	51%

Grade	N	Authoring	Concept mapping	Database	Draw/paint/ graphics	Internet browser	Presentation	Spreadsheet	Word processing
Eleventh	57	18%	18%	7%	32%	61%	26%	7%	56%
Twelfth	50	18%	22%	10%	32%	68%	30%	10%	60%
Adult	11	27%	45%	18%	36%	64%	36%	36%	64%

Table A10. Student use of other software by discipline.

Discipline	n	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem-solving	Process tools	Testing
English	92	15%	14%	55%	10%	16%	36%	10%	41%
Reading	85	19%	14%	72%	13%	19%	54%	14%	49%
Math	116	18%	13%	56%	9%	16%	46%	15%	37%
Science	147	16%	14%	42%	9%	16%	37%	11%	28%
Social Studies	89	18%	17%	66%	13%	19%	52%	18%	45%
Physical Education	0	0%	0%	0%	0%	0%	0%	0%	0%
Art/Music	8	13%	13%	25%	13%	13%	38%	0%	13%
Media/ Technology Specialist	16	13%	19%	63%	19%	19%	44%	25%	44%
Special Education	16	50%	25%	81%	19%	25%	63%	25%	44%
Vocational Education	4	25%	50%	75%	25%	50%	75%	50%	75%
Other	38	16%	16%	55%	13%	11%	45%	13%	32%

Table A11. Student use of other software by grade level.

Grade	N	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem-solving	Process tools	Testing
Pre-K	5	20%	20%	60%	20%	20%	40%	0%	20%
Kindergarten	17	12%	12%	47%	12%	18%	24%	0%	18%
First	20	20%	15%	55%	15%	20%	35%	0%	20%
Second	25	12%	12%	68%	20%	20%	40%	4%	32%
Third	37	27%	14%	70%	14%	27%	49%	11%	43%
Fourth	29	21%	14%	69%	10%	24%	48%	17%	45%
Fifth	23	13%	17%	61%	9%	30%	48%	9%	43%
Sixth	90	10%	12%	43%	7%	12%	32%	14%	31%
Seventh	86	15%	15%	34%	6%	6%	29%	12%	20%
Eighth	101	17%	14%	37%	10%	15%	37%	12%	24%
Ninth	55	13%	9%	27%	9%	15%	29%	7%	20%
Tenth	61	15%	20%	34%	5%	18%	36%	8%	20%
Eleventh	57	18%	19%	30%	7%	14%	37%	11%	12%
Twelfth	50	16%	22%	34%	6%	16%	36%	10%	14%

Grade	N	CD reference	Communications	Drill/ practice/ tutorial	Other	Planning	Problem-solving	Process tools	Testing
Adult	11	27%	36%	36%	9%	18%	45%	18%	18%

Table A12. Student use of digital production software by discipline.

Discipline	n	Digital audio	Digital storytelling	Digital video	Graphic organizers	Podcasting
English	92	9%	0%	3%	21%	8%
Reading	85	16%	12%	9%	29%	11%
Math	116	9%	9%	9%	23%	9%
Science	147	10%	6%	7%	20%	8%
Social Studies	89	16%	12%	11%	28%	12%
Art/Music	8	0%	0%	0%	0%	13%
Physical Education	0	0%	0%	0%	0%	0%
Media/Technology Specialist	16	6%	0%	6%	31%	13%
Special Education	16	25%		13%	25%	19%
Vocational Education	4	25%	25%	50%	75%	25%
Other	38	18%	11%	5%	32%	16%

Table A13. Student use of digital production software by grade level.

Discipline	n	Digital audio	Digital storytelling	Digital video	Graphic organizers	Podcasting
Pre-K	5	0%	0%	0%	20%	0%
Kindergarten	17	0%	0%	0%	12%	6%
First	20	15%	10%	0%	15%	15%
Second	25	8%	4%	4%	20%	16%
Third	37	16%	14%	3%	27%	11%
Fourth	29	14%	3%	3%	31%	7%
Fifth	23	4%	0%	0%	22%	4%
Sixth	90	9%	4%	11%	26%	8%
Seventh	86	9%	5%	12%	16%	8%
Eighth	101	11%	6%	14%	23%	9%
Ninth	55	13%	2%	5%	15%	4%
Tenth	61	7%	2%	7%	18%	5%
Eleventh	57	5%	4%	9%	21%	7%
Twelfth	50	8%	4%	8%	22%	6%
Adult	11	0%	9%	9%	45%	9%

Appendix B. Classroom Observation Frequencies

Table B1. School Observation Measure (WS/Multi-Class)

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Instructional Orientation	
Direct instruction (lecture)	39%
Cooperative/collaborative learning	19%
Classroom Organization	
Ability groups	13%
Multi-age grouping	4%
Instructional Strategies	
Teacher acting as a coach/facilitator	35%
Project-based learning	32%
Student Activities	
Experiential, hands-on learning	22%
Independent seatwork (self-paced worksheets, individual assignments)	22%
Technology Use	
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	37%
Computer for instructional delivery (e.g., CAI, drill & practice)	26%
Assessment	
Performance assessment strategies	6%
Summary Items	
High academically focused class time	82%
High level of student attention/interest/engagement	72%

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Instructional Orientation	
Individual tutoring (teacher, peer, aide, adult volunteer)	91%
Team teaching	89%
Classroom Organization	
Work centers (for individuals or groups)	94%
Instructional Strategies	
Parent/community involvement in learning activities	98%
Integration of subject areas (interdisciplinary/thematic units)	80%
Student Activities	
Systematic individual instruction (differential assignments geared to individual needs)	91%
Sustained writing/composition (self-selected or teacher-generated topics)	85%

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Technology Use	
N/A	N/A
Assessment	
Student self-assessment (portfolios, individual record books)	98%
Summary Items	
N/A	N/A

Items with the biggest changes (% Frequently + Extensively)

Items	Fall 2006	Spring 2007
High level of student attention/interest/engagement	29%	72%
Independent seatwork (self-paced worksheets, individual assignments)	65%	22%
Direct instruction (lecture)	74%	39%
Project-based learning	0%	32%
High academically focused class time	56%	82%

Table B2. School Observation Measure (WS/Multi-Class) Data Summary

Number of Respondents for Survey Period 1   Fall 2006   N = 34

Number of Respondents for Survey Period 2   Spring 2007   N = 54

Note: One school observation visit equals approximately 10 classroom visits.

School Observation Measure (WS/Multi-Class) Items	Not observed		Rarely		Occasional		Frequent		Extensive	
Survey Period	1	2	1	2	1	2	1	2	1	2
Instructional Orientation										
Direct instruction (lecture)	0%	2%	6%	20%	21%	39%	50%	35%	24%	4%
Team teaching	68%	59%	27%	30%	6%	11%	0%	0%	0%	0%
Cooperative/collaborative learning	41%	24%	32%	24%	27%	33%	0%	19%	0%	0%
Individual tutoring (teacher, peer, aide, adult volunteer)	59%	65%	24%	26%	15%	9%	3%	0%	0%	0%
Classroom Organization										
Ability groups	59%	63%	27%	19%	6%	6%	3%	9%	6%	4%
Multi-age grouping	85%	78%	9%	9%	6%	9%	0%	4%	0%	0%
Work centers (for individuals or groups)	82%	72%	12%	22%	6%	6%	0%	0%	0%	0%
Instructional Strategies										
Higher-level instructional feedback (written or verbal) to enhance student learning	32%	17%	24%	37%	24%	20%	18%	20%	3%	6%
Integration of subject areas (interdisciplinary/thematic units)	56%	56%	35%	24%	6%	7%	0%	11%	3%	2%

School Observation Measure (WS/Multi-Class) Items	Not observed		Rarely		Occasional		Frequent		Extensive	
Project-based learning	62%	32%	18%	19%	21%	19%	0%	26%	0%	6%
Use of higher-level questioning strategies	29%	26%	32%	28%	21%	17%	18%	20%	0%	9%
Teacher acting as a coach/facilitator	38%	2%	21%	28%	21%	35%	18%	20%	3%	15%
Parent/community involvement in learning activities	94%	93%	6%	6%	0%	0%	0%	0%	0%	2%
Student Activities										
Independent seatwork (self-paced worksheets, individual assignments)	3%	11%	12%	35%	21%	32%	44%	19%	21%	4%
Experiential, hands-on learning	44%	33%	29%	26%	24%	19%	3%	17%	0%	6%
Systematic individual instruction (differential assignments geared to individual needs)	71%	78%	27%	13%	3%	6%	0%	0%	0%	370%
Sustained writing/composition (self-selected or teacher-generated topics)	65%	52%	27%	33%	590%	13%	3%	2%	0%	0%
Sustained reading	65%	44%	24%	41%	6%	15%	6%	0%	0%	0%
Independent inquiry/research on the part of students	44%	19%	41%	39%	9%	26%	6%	1,480	0%	2%
Student discussion	32%	41%	35%	19%	32%	33%	0%	6%	0%	2%
Technology Use										
Computer for instructional delivery (e.g., CAI, drill & practice)	3%	19%	18%	20%	56%	35%	15%	22%	9%	4%
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	27%	6%	32%	22%	27%	35%	9%	26%	6%	11%
Assessment										
Performance assessment strategies	82%	67%	12%	20%	0%	7%	6%	6%	0%	0%
Student self-assessment (portfolios, individual record books)	88%	78%	3%	20%	6%	2%	3%	0%	0%	0%
Summary Items										
High academically focused class time	0%	0%	6%	0%	38%	19%	47%	59%	9%	22%
High level of student attention/interest/engagement	0%	0%	15%	2%	56%	26%	27%	52%	3%	20%

About the Instrument: School Observation Measure

Summarized in this section of the report are the results from the school observation visits that were conducted at your school. Multiple observations using the School Observation Measure (SOM©) allow researchers to determine the extent to which 24 factors associated with school improvement are present in each school. Schools can then evaluate actual, observed classroom practices within the context of their instructional goals.

The factors are organized in six categories:

- Instructional Orientation
- Classroom Organization
- Instructional Strategies
- Student Activities
- Technology Use
- Assessment

In addition, the instrument solicits summary information regarding:

- The amount of class time devoted to academics
- The level of student engagement

To ensure the reliability of data, observers are trained to use the SOM. In a reliability study (Lewis, Ross, & Alberg, 1999), pairs of trained observers selected the identical overall response on the five-category rubric on 67% of the items and were within one category on 95% of the items.

The results begin with a Big Picture look at the SOM followed by a detailed Data Summary.

Table B3. School Observation Measure (Targeted) Big Picture

Items with the most prevalence (% Frequently + Extensively) in Spring 2007:

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Instructional Orientation	
Cooperative/collaborative learning	54%
Direct instruction (lecture)	39%
Classroom Organization	
Ability groups	15%
Work centers (for individuals or groups)	9%
Instructional Strategies	
Teacher acting as a coach/facilitator	62%
Project-based learning	53%
Student Activities	
Independent inquiry/research on the part of students	51%
Experiential, hands-on learning	37%
Technology Use	
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	72%
Computer for instructional delivery (e.g., CAI, drill & practice)	36%
Assessment	
Student self-assessment (portfolios, individual record books)	12%
Performance assessment strategies	4%

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Summary Items	
High level of student attention/interest/engagement	76%
High academically focused class time	72%

Items with the least prevalence (% Not Observed + Rarely) in Spring 2007:

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Instructional Orientation	
Team teaching	79%
Individual tutoring (teacher, peer, aide, adult volunteer)	78%
Classroom Organization	
Multi-age grouping	91%
Instructional Strategies	
Parent/community involvement in learning activities	91%
Integration of subject areas (interdisciplinary/thematic units)	58%
Student Activities	
Sustained writing/composition (self-selected or teacher-generated topics)	86%
Systematic individual instruction (differential assignments geared to individual needs)	86%
Technology Use	
N/A	N/A
Assessment	
N/A	N/A
Summary Items	
N/A	N/A

Items with the biggest changes (% Frequently + Extensively)

Items	Fall 2006	Spring 2007
Project-based learning	16%	53%
Teacher acting as a coach/facilitator	26%	62%
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	39%	72%
Cooperative/collaborative learning	21%	54%
Integration of subject areas (interdisciplinary/thematic units)	3%	34%

Table B4. School Observation Measure (Targeted) Data Summary

Number of Respondents for Survey Period 1   Fall 2006   N = 38

Number of Respondents for Survey Period 2   Spring 2007   N = 76

School Observation Measure (Targeted) Items	Not observed		Rarely		Occasional		Frequent		Extensive	
Survey Period	1	2	1	2	1	2	1	2	1	2
Instructional Orientation										
Direct instruction (lecture)	16%	17%	16%	25%	13%	18%	26%	20%	29%	20%
Team teaching	82%	72%	3%	7%	3%	8%	3%	9%	11%	4%
Cooperative/collaborative learning	53%	36%	16%	4%	11%	7%	8%	36%	13%	18%
Individual tutoring (teacher, peer, aide, adult volunteer)	79%	65%	8%	13%	8%	9%	3%	13%	3%	0%
Classroom Organization										
Ability groups	87%	76%	0%	4%	0%	5%	3%	0%	11%	15%
Multi-age grouping	92%	90%	0%	1%	3%	5%	0%	1%	5%	3%
Work centers (for individuals or groups)	87%	87%	3%	0%	0%	4%	3%	9%	8%	0%
Instructional Strategies										
Higher-level instructional feedback (written or verbal) to enhance student learning	42%	25%	18%	9%	11%	22%	18%	25%	11%	1,840
Integration of subject areas (interdisciplinary/thematic units)	90%	54%	3%	4%	5%	8%	0%	24%	3%	11%
Project-based learning	82%	40%	3%	1%	0%	7%	8%	28%	8%	25%
Use of higher-level questioning strategies	55%	34%	11%	17%	16%	13%	13%	21%	5%	15%
Teacher acting as a coach/facilitator	32%	9%	5%	11%	37%	18%	16%	37%	11%	25%
Parent/community involvement in learning activities	95%	87%	0%	4%	0%	3%	0%	4%	5%	3%
Student Activities										
Independent seatwork (self-paced worksheets, individual assignments)	34%	51%	13%	12%	18%	12%	16%	18%	18%	7%
Experiential, hands-on learning	50%	46%	3%	3%	21%	15%	16%	12%	11%	25%
Systematic individual instruction (differential assignments geared to individual needs)	87%	82%	3%	4%	0%	4%	3%	7%	8%	4%
Sustained writing/composition (self-selected or teacher-generated topics)	92%	71%	3%	15%	5%	9%	0%	5%	0%	0%
Sustained reading	92%	70%	3%	15%	0%	9%	3%	4%	3%	3%
Independent inquiry/research on the part of students	66%	29%	0%	8%	11%	12%	5%	33%	18%	18%
Student discussion	58%	37%	18%	7%	3%	22%	11%	26%	11%	8%
Technology Use										
Computer for instructional delivery (e.g., CAI, drill & practice)	26%	43%	5%	8%	18%	13%	5%	18%	45%	17%

School Observation Measure (Targeted) Items	Not observed		Rarely		Occasional		Frequent		Extensive	
Technology as a learning tool or resource (e.g., Internet research, spreadsheet or database creation, multi-media, CD Rom, Laser disk)	32%	12%	8%	4%	21%	12%	11%	22%	29%	50%
Assessment										
Performance assessment strategies	92%	82%	5%	3%	3%	12%	0%	4%	0%	0%
Student self-assessment (portfolios, individual record books)	97%	78%	0%	3%	0%	8%	0%	11%	3%	1%
Summary Items										
High academically focused class time	3%	0%	5%	4%	21%	24%	24%	29%	47%	43%
High level of student attention/interest/engagement	8%	0%	8%	7%	21%	17%	37%	34%	26%	42%

About the Instrument: Survey of Computer Use

The SCU was designed to capture exclusively student access to, ability with, and use of computers rather than teacher use of technology.

Therefore, four primary types of data are recorded:

1. computer capacity and currency
2. configuration
3. student computer ability
4. 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 is available. Configuration refers to the number of students working at each computer (e.g., alone, in pairs, in small groups). Student computer ability is assessed by recording the number of students who are computer literate (e.g., easily use software features/menus, saved or printed documents) and the number of students who easily use the keyboard to enter text or numerical information. Student use of computers is observed with regard to the types of activities, subject areas of activities, and software being used.

The results begin with a Big Picture look at the SCU, followed by a detailed Data Summary and concluding with an Addendum detailing other tools or software observed, if provided.

Table B5. Survey of Computer Use (Whole School/Multi-Class) Big Picture

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Indicate how frequently students used the following computers	
Laptop computers.	74%
Digital Accessories (e.g. camera, scanner, probes).	11%
Production Tools Used by Students	
Presentation	32%
Word Processor	26%
Internet/Research Tools Used by Students	

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Internet Browser	56%
Other Internet/Research Tools	9%
Educational software used by Students	
Drill/Practice/Tutorial	8%
Other educational software	6%
Testing Software	
Individualized/Tracked	6%
Generic	2%
Overall Meaningful Use of Computers	
Meaningful use of computers	39%
Very meaningful use of computers	22%

Items with the least prevalence in Spring 2007:	% Frequently + Extensively
Indicate how frequently students used the following computers	
Information Processors (e.g. Alphaboard).	100%
Personal Data Assistants (PDA).	98%
Production Tools Used by Students	
Planning (e.g. MS Project)	100%
Database	98%
Internet/Research Tools Used by Students	
CD Reference	98%
Communications	91%
Educational software used by Students	
Problem-Solving	91%
Process Tools	87%
Testing Software	
Other testing software	100%
Overall Meaningful Use of Computers	
Low level use of computers	80%
Somewhat meaningful use of computers	48%

Items with the biggest changes (% Frequently + Extensively)

Items	Fall 2006	Spring 2007
Internet Browser	14%	56%
Laptop computers.	37%	74%
Meaningful use of computers	9%	39%
Presentation	6%	32%
Very meaningful use of computers	3%	22%

Table B6. Survey of Computer Use (Whole School/Multi-Class) Data Summary

Number of Respondents for Survey Period 1   Fall 2006   N = 35

Number of Respondents for Survey Period 2   Spring 2007   N = 54

Note: One school observation visit equals approximately 10 classroom visits.

Survey of Computer Use (Whole School/Multi-Class) Items	Not observed		Rare		Occasional		Frequent		Extensive	
Survey Period	1	2	1	2	1	2	1	2	1	2
Indicate how frequently students used the following computers										
Desktop computers.	60%	41%	17%	33%	14%	19%	6%	7%	3%	0%
Laptop computers.	26%	2%	11%	7%	26%	17%	23%	32%	14%	43%
Personal Data Assistants (PDA).	10%	94%	0%	4%	0%	2%	0%	0%	0%	0%
Graphing calculators.	10%	89%	0%	7%	0%	4%	0%	0%	0%	0%
Information Processors.	97%	98%	3%	2%	0%	0%	0%	0%	0%	0%
Digital Accessories	80%	57%	14%	20%	6%	11%	0%	9%	0%	2%
Production Tools Used by Students										
Word Processor	49%	33%	23%	22%	17%	19%	6%	19%	6%	7%
Database	10%	94%	0%	4%	0%	2%	0%	0%	0%	0%
Spreadsheet	89%	82%	9%	7%	3%	11%	0%	0%	0%	0%
Draw/Paint/Graphics/Photo-imaging	83%	59%	11%	15%	6%	15%	0%	9%	0%	2%
Presentation	54%	33%	23%	22%	17%	13%	3%	24%	3%	7%
Authoring	94%	80%	0%	4%	3%	11%	0%	6%	3%	0%
Concept Mapping	80%	78%	20%	11%	0%	9%	0%	0%	0%	2%
Planning (e.g. MS Project)	10%	98%	0%	2%	0%	0%	0%	0%	0%	0%
Other production tools	89%	67%	6%	11%	3%	9%	0%	9%	3%	370%
Internet/Research Tools Used by Students										
Internet Browser	37%	17%	20%	17%	29%	11%	11%	44%	3%	11%
CD Reference	91%	96%	86%	2%	0%	2%	0%	0%	0%	0%
Communications	97%	85%	3%	6%	0%	9%	0%	0%	0%	0%
Other Internet/Research Tools	86%	82%	86%	6%	3%	4%	3%	9%	0%	0%
Educational software used by Students										
Drill/Practice/Tutorial	49%	54%	17%	26%	17%	13%	14%	6%	3%	2%
Problem-Solving	91%	87%	3%	4%	6%	6%	0%	4%	0%	0%
Process Tools	94%	85%	0%	2%	3%	9%	0%	4%	3%	0%
Other educational software	94%	87%	3%	2%	3%	6%	0%	6%	0%	0%
Testing Software										
Individualized/Tracked	86%	76%	6%	740%	6%	11%	3%	4%	0%	3%
Generic	97%	93%	3%	6%	0%	0%	0%	3%	0%	0%
Other testing software	91%	96%	3%	4%	6%	0%	0%	0%	0%	0%

Survey of Computer Use (Whole School/Multi-Class) Items	Not observed		Rare		Occasional		Frequent		Extensive	
Overall Meaningful Use of Computers										
Low level use of computers	43%	48%	26%	32%	9%	15%	17%	6%	6%	0%
Somewhat meaningful use of computers	37%	33%	40%	15%	23%	44%	0%	6%	0%	2%
Meaningful use of computers	49%	19%	17%	22%	26%	20%	9%	32%	0%	7%
Very meaningful use of computers	80%	50%	11%	15%	6%	13%	3%	19%	0%	4%

Table B7. Survey of Computer Use (Whole School/Multi-Class) Summary Items

Number of Observations for Survey Period 1   Fall 2006   N = 35

Number of Observations for Survey Period 2   Spring 2007   N = 54

Computer Configuration	1	2
Classrooms most frequently had the following number of computers or digital tools		
Few (less than 10%) students	14%	0%
Some (about 10-50%) students	14%	13%
Most (about 51-90%) students	34%	32%
Nearly all (91%-100%) students	29%	52%
Students did not use computers	9%	4%
Classroom computers were most frequently		
Up-to-date	74%	98%
Aging but adequate	26%	0%
Outdated/limited capacity	0%	2%
No computers were observed	0%	0%
In classrooms, computers were most frequently		
Connected to the Internet	91%	93%
Not connected to the Internet	9%	7%
No computers were observed	0%	0%
Total number of classrooms visited		
Total Number	291	429
Total number of classrooms without students using computers		
Total Number	166	155

Computer Use	1	2
Classroom computers or digital tools were most frequently used by		
None	6%	0%
One	0%	0%
2-4	26%	7%
5-10	11%	20%
11 or more	57%	72%

Computer Use	1	2
Students most frequently worked with computers or digital tools		
Alone	89%	76%
In pairs	0%	15%
In small groups	3%	4%
Students did not use computers	9%	6%
Student computer literacy skills were most frequently		
Poor	6%	4%
Moderate	40%	32%
Very good	31%	46%
Not observed	23%	19%
Student keyboarding skills were most frequently		
Poor	9%	2%
Moderate	40%	39%
Very good	14%	35%
Not observed	37%	24%

	Language Arts		Math		Science		Social Studies		Other		None	
Survey Period	1	2	1	2	1	2	1	2	1	2	1	2
Indicate all subject areas involved with the use of Production Tools:	37%	74%	17%	30%	34%	44%	31%	41%	6%	9%	23%	6%
Indicate all subject areas involved with the use of Internet/Research Tools:	26%	59%	11%	22%	31%	44%	20%	43%	3%	4%	37%	15%
Indicate all subject areas involved with the use of Educational Software:	37%	35%	20%	39%	9%	24%	6%	15%	3%	2%	54%	35%
Indicate all subject areas involved with the use of Testing Software:	20%	30%	3%	20%	3%	17%	9%	11%	0%	0%	74%	54%

Survey Period: Fall 2006

Table B8. Survey of Computer Use (Whole School/Multi-Class) Addendum

Note: Activities are reported verbatim from observers.

Activites reported from observers
Please describe other production tools
Calculator
Encarta Kids
NoteTaker notebooks

Activites reported from observers
One student was entering some classroom project topics into an EXCEL worksheet
Student drop-box
Student used Audacity to record his oral reading.
Please describe other Internet/Research tools
Ask Jeeves World history site
FCAT Explorer
Google Search Engine
Not observed
Survey Monkey online survey
Teacher's website
Please describe other educational software
Adopted text electronic dictionary/glossary; students typed in word and read definition aloud
Not Observed
SchoolKit
Text publisher FCAT Prep Software
Please describe other testing software
FCAT Explorer
FCAT explorer and My Skills Tutor
Handheld electronic response generators used by students
Not observed
test created in Quia

Survey Period: Spring 2007

Table B9. Survey of Computer Use (Whole School/Multi-Class) Addendum

Note: Activities are reported verbatim from observers.

Activities reported from observers
Please describe other production tools
Audacity and Photoshop
Audacity and TI-Smartview
audio recording using Audacity
book creation software on-line
Comic Life
Discussion boards
GPS systems for GPS lab center in Pre-Space elective class
Microsoft Publisher, Windows Media Player, PDAs
NoteTaker

Activities reported from observers
NoteTaker / Comic Life
scanner, digital video, document camera
Smartboards and LCDs were located in classrooms; no use or power whatsoever throughout the day; I witnessed two or three students in the hallway between classes with a laptop appearing to listen to music; not positive what was being watched
Student and teacher drop/distribute folders to share documents.
Student/teacher drop and distribute folders for sharing documents.
Students used digital cameras to take photos of each other and imported the photos into power point.
Students were using GarageBand to create music for presentations.
video – MovieMaker
Windows Journal
Windows MovieMaker
Please describe other Internet/Research tools
ask.com and Cleveland Art Museum
ask.com; wikipedia; answers.com
BrainPop
Gizmos online simulations
Roald Dahl websites
Students researched enough to frequently get around sites blocked by MIS and/or get what they wanted. Some discovered and proved to us just how resourceful they can be when they are determined!
Teacher drop and distribute monster.com
Wikis
www.presidentialchallenge.org website, the use of PDAs and LabProbes
Please describe other educational software
Classroom Performance System
Comic life
Companion CDs and DVDs as supplements provided by textbook companies.
CPS software for use with student response units
Media Cruizer (Scorbot, Hydroponics, Laser and GPS)
Read 180
Rocket Modler
SchoolKits's edClass
Science text review CD with student response units for review game.
Please describe other testing software
Accelerated math
NA
SRI Testing

Activities reported from observers
Website for a Cardiovascular quiz

About the Instrument: Survey of Computer Use

The SCU was designed to capture exclusively student access to, ability with, and use of computers rather than teacher use of technology.

Therefore, four primary types of data are recorded:

1. computer capacity and currency

2. configuration

3. student computer ability

4. 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 is available. Configuration refers to the number of students working at each computer (e.g., alone, in pairs, in small groups). Student computer ability is assessed by recording the number of students who are computer literate (e.g., easily use software features/menus, saved or printed documents) and the number of students who easily use the keyboard to enter text or numerical information. Student use of computers is observed with regard to the types of activities, subject areas of activities, and software being used.

The results begin with a Big Picture look at the SCU, followed by a detailed Data Summary and concluding with an Addendum detailing other tools or software observed, if provided.

Items with the most prevalence (% Frequently + Extensively) in Spring 2007:

Table B10. Survey of Computer Use (Targeted) Big Picture

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Indicate how frequently students used the following computers	
Laptop computers.	71%
Digital Accessories (e.g. camera, scanner, probes).	16%
Production Tools Used by Students	
Presentation	36%
Word Processor	30%
Internet/Research Tools Used by Students	
Internet Browser	56%
Other Internet/Research Tools	7%
Educational software used by Students	
Process Tools	9%
Drill/Practice/Tutorial	7%
Testing Software	

Items with the most prevalence in Spring 2007:	% Frequently + Extensively
Individualized/Tracked	7%
Other testing software	3%
Overall Meaningful Use of Computers	
Meaningful use of computers	50%
Very meaningful use of computers	27%

Items with the least prevalence (% Not Observed + Rarely) in Spring 2007:

Items with the least prevalence in Spring 2007:	% Frequently + Extensively
Indicate how frequently students used the following computers	
Information Processors (e.g. Alphaboard).	99%
Personal Data Assistants (PDA).	94%
Graphing calculators.	94%
Production Tools Used by Students	
Database	100%
Planning (e.g. MS Project)	100%
Internet/Research Tools Used by Students	
CD Reference	100%
Communications	99%
Educational software used by Students	
Problem-Solving	97%
Other educational software	94%
Testing Software	
Generic	100%
Overall Meaningful Use of Computers	
Low level use of computers	86%
Somewhat meaningful use of computers	61%

Items with the biggest changes (% Frequently + Extensively)

Items	Fall 2006	Spring 2007
Internet Browser	22%	56%
Meaningful use of computers	24%	50%
Presentation	11%	36%
Other production tools	3%	21%
Low level use of computers	22%	4%

Table B11. Survey of Computer Use (Targeted) Data Summary

Number of Respondents for Survey Period 1   Fall 2006   N = 37

Survey of Computer Use (Targeted) Items	Not Observed		Rarely		Occasional		Frequent		Extensive	
Survey Period	1	2	1	2	1	2	1	2	1	2
Desktop computers.	81%	69%	19%	9%	0%	13%	0%	7%	0%	3%
Laptop computers.	24%	20%	3%	4%	11%	4%	11%	10%	51%	61%
Personal Data Assistants (PDA).	97%	94%	0%	0%	0%	3%	3%	0%	0%	3%
Graphing calculators.	10%	94%	0%	0%	0%	1%	0%	1%	0%	3%
Information Processors.	97%	99%	3%	0%	0%	1%	0%	0%	0%	0%
Digital Accessories	89%	70%	8%	7%	0%	7%	0%	7%	3%	9%
Production Tools Used by Students										
Word Processor	60%	60%	5%	3%	8%	7%	8%	20%	19%	10%
Database	95%	100%	3%	0%	0%	0%	3%	0%	0%	0%
Spreadsheet	95%	96%	0%	1%	0%	0%	5%	3%	0%	0%
Draw/Paint/Graphics/Photo-imaging	87%	69%	0%	7%	8%	10%	0%	10%	5%	4%
Presentation	87%	50%	0%	4%	3%	10%	5%	24%	5%	11%
Authoring	97%	91%	0%	3%	0%	0%	0%	3%	3%	3%
Concept Mapping	89%	89%	3%	4%	3%	1%	3%	1%	3%	4%
Planning (e.g. MS Project)	100%	99%	0%	1%	0%	0%	0%	0%	0%	0%
Other production tools	95%	73%	3%	1%	0%	4%	3%	14%	0%	7%
Internet/Research Tools Used by Students										
Internet Browser	54%	29%	11%	6%	14%	10%	5%	29%	16%	27%
CD Reference	95%	100%	5%	0%	0%	0%	0%	0%	0%	0%
Communications	100%	96%	0%	3%	0%	0%	0%	1%	0%	0%
Other Internet/Research Tools	78%	87%	8%	1%	5%	4%	5%	6%	3%	1%
Educational software used by Students										
Drill/Practice/Tutorial	95%	86%	0%	4%	0%	3%	3%	7%	3%	0%
Problem-Solving	97%	94%	0%	3%	3%	0%	0%	3%	0%	0%
Process Tools	95%	89%	0%	1%	0%	1%	3%	9%	3%	0%
Other educational software	89.2%	93%	0%	1%	0%	0%	5%	3%	5%	3%
Testing Software										
Individualized/Tracked	95%	91%	3%	0%	0%	1%	0%	7%	3%	0%
Generic	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%
Other testing software	97%	97%	0%	0%	0%	0%	0%	3%	3%	0%
Overall Meaningful Use of Computers										
Low level use of computers	65%	66%	8%	20%	5%	10%	5%	3%	16%	1%
Somewhat meaningful use of computers	65%	46%	3%	16%	22%	21%	11%	11%	0%	6%

Survey of Computer Use (Targeted) Items	Not Observed		Rarely		Occasional		Frequent		Extensive	
Meaningful use of computers	62%	29%	11%	9%	3%	13%	16%	40%	8%	10%
Very meaningful use of computers	81%	50%	0%	16%	5%	7%	8%	11%	5%	16%

Table B12. Survey of Computer Use (Targeted) Summary Items

Number of Observations for Survey Period 1   Fall 2006   N = 37

Number of Observations for Survey Period 2   Spring 2007   N = 70

Note: One school observation visit equals approximately 10 classroom visits.

Computer Configuration	1	2
Classrooms most frequently had the following number of computers or digital tools		
None	8%	0%
One	0%	0%
2-4	14%	3%
5-10	14%	10%
11 or more	65%	87%
Classroom computers were most frequently		
Up-to-date	81%	99%
Aging but adequate	11%	1%
Outdated/limited capacity	3%	0%
No computers were observed	5%	0%
In classrooms, computers were most frequently		
Connected to the Internet	84%	97%
Not connected to the Internet	8%	3%
No computers were observed	8%	0%
Total number of classrooms visited		
Total Number	49	108
Total number of classrooms without students using computers		
Total Number	13	19

Computer Use	1	2
Classroom computers or digital tools were most frequently used by		
Few (less than 10%) students	11%	6%
Some (about 10-50%) students	5%	4%
Most (about 51-90%) students	3%	10%
Nearly all (91%-100%) students	62%	71%
Students did not use computers	19%	9%
Students most frequently worked with computers or digital tools		
Alone	70%	71%

Computer Use	1	2
In pairs	5%	10%
In small groups	5%	13%
Students did not use computers	19%	6%
Student computer literacy skills were most frequently		
Poor	8%	0%
Moderate	43%	26%
Very good	19%	56%
Not observed	30%	19%
Student keyboarding skills were most frequently		
Poor	19%	1%
Moderate	32%	37%
Very good	16%	36%
Not observed	32%	26%

	Language Arts		Math		Science		Social Studies		Other		None	
Survey Period	1	2	1	2	1	2	1	2	1	2	1	2
Indicate all subject areas involved with the use of Production Tools:	22%	44%	8%	19%	24%	39%	11%	27%	3%	11%	35%	11%
Indicate all subject areas involved with the use of Internet/Research Tools:	8%	36%	5%	14%	19%	31%	5%	21%	3%	9%	68%	21%
Indicate all subject areas involved with the use of Educational Software:	8%	16%	5%	11%	5%	13%	0%	13%	3%	0%	81%	56%
Indicate all subject areas involved with the use of Testing Software:	5%	11%	8%	3%	5%	10%	3%	11%	0%	0%	84%	69%

Survey Period: Fall 2006

Table B13. Survey of Computer Use (Targeted) Addendum

Note: Activities are reported verbatim from observers.

Activities reported from observers
Please describe other production tools
Digital drop-box
Digital Projector
FCAT Calculator
Please describe other Internet/Research tools

Activities reported from observers
Ask Jeeves
Ask Jeeves, Google, Wikipedia
Online database to look up books on ghost stories
Student digital drop box
Student drop-box
Students used the Holt-Reinhart textbook online website to review the material they were studying about the Characteristics of Life
Webquests and answers.com
Wikipedia
Please describe other educational software
Chem Lab Simulation
Learn 2 Learn software - similar to FastForWords - to help FCAT Level 1 & 2 students.
Textbook
Textbook software used by the teacher and observed by the students.
Please describe other testing software
The teacher used the software, the students participated in the lesson by observing her usage on the projection screen.

Survey Period: Spring 2007

Table B14. Survey of Computer Use (Targeted) Addendum

Note: Activities are reported verbatim from observers.

Activities reported from observers
Please describe other production tools
Audacity and Photoshop
Audacity, I-Movie
audio recording using Audacity
Comic Life
image searches
Lab Probes-PH Sensor, PDAs
MovieMaker, PhotoStory, and teacher drop/distribute folders.
MS Paint-MS Word-Powerpoint
Puzzle Maker
Stickman (teachers had learned about in Digital Educators Summer Institute) and teacher/student drop and distribute folders.

Activities reported from observers
Student/teacher drop and distribute folders for sharing documents.
Student/Teacher drop and distribute folders to share documents.
Student/teacher drop and distribute folders, which allow teachers to share and grade documents with and from students.
Student/teacher drop and distribute folders.
students downloading zoo digital photos and video clips to computers
Students used PDAs and LabProbes
Teacher/student drop and distribute folders.
TI - Presenter and TI Connect w/ laptop and LCD can display, copy and print
Webquests
Please describe other Internet/Research tools
ask.com
Florida Virtual Schools
Google Earth
Google searches, internet research for images and facts
Google searches, teachers uses a Blog for classroom communication. mapquest and vehicles.com
Webquest projectors, document cameras
Teacher provided websites and a teacher-provided webquest. trackstar was used to have an access point for all URL's for students' use
Used online version of Social Studies textbook.
Video conferencing with another class
www.illuminations.com
Please describe other educational software
Audio Book on CD played on laptop
Classroom Performance System clicker
CPS software in use with student response units.
Edline - a program students and parents can access through the school webpage in order to check grades, daily assignments and other useful information.
School Kit's edClass
Please describe other testing software
Classroom Response System
Florida Virtual Schools' AP Test Review

Appendix C. Classroom Observation Data And Analyses

TABLE C1. Multi Class School Observation Measure (SOM)

Fall (Baseline) N=34 (284 Classrooms)
Spring   N=54 (447 Classrooms)

The extent to which each of the following was observed in the classroom.		Percent Observed			Florida EETT			National Norm	
		None	Occ.	Freq.	M	SD	ES	M	SD
Instructional Orientation									
Direct instruction (lecture)	Baseline	6%	21%	74%	2.91	0.83	-0.82	2.77	1.01
	Spring	22%	39%	39%	2.19	0.87			
Team teaching	Baseline	94%	6%	0%	0.38	0.60	+0.15	0.81	0.94
	Spring	89%	11%	0%	0.52	0.69			
Cooperative/collaborative learning	Baseline	74%	27%	0%	0.85	0.82	+0.62	1.08	0.98
	Spring	48%	33%	19%	1.46	1.06			
Individual tutoring (teacher, peer, aide, adult volunteer)	Baseline	82%	15%	3%	0.62	0.85	-0.25	0.77	0.94
	Spring	91%	9%	0%	0.44	0.66			
Classroom Organization									
Ability groups	Baseline	85%	6%	9%	0.71	1.12	0.00	1.16	1.33
	Spring	82%	6%	13%	0.72	1.16			
Multi-age grouping	Baseline	94%	6%	0%	0.21	0.54	+0.30	0.58	1.03
	Spring	87%	9%	4%	0.39	0.81			
Work centers (for individuals or groups)	Baseline	94%	6%	0%	0.24	0.55	+0.17	1.35	1.14
	Spring	94%	6%	0%	0.33	0.58			
Instructional Strategies									
Higher level instructional feedback (written or verbal) to enhance student learning	Baseline	56%	24%	21%	1.35	1.20	+0.17	1.44	1.15
	Spring	54%	20%	26%	1.61	1.16			
Integration of subject areas (interdisciplinary/thematic units)	Baseline	91%	6%	3%	0.59	0.86	+0.20	0.54	0.80
	Spring	80%	7%	13%	0.80	1.11			
Project-based learning	Baseline	79%	21%	0%	0.59	0.82	+0.93	0.45	0.76
	Spring	50%	19%	32%	1.56	1.33			
Use of higher-level questioning strategies	Baseline	62%	21%	18%	1.26	1.08	+0.25	1.63	1.12
	Spring	54%	17%	30%	1.59	1.32			
Teacher acting as a coach/facilitator	Baseline	59%	21%	21%	1.26	1.24	+0.78	2.29	1.18
	Spring	30%	35%	35%	2.19	1.07			
Parent/community involvement in learning activities	Baseline	100%	0%	0%	0.06	0.24	0.00	0.31	0.60
	Spring	98%	0%	2%	0.13	0.58			
Student Activities									

The extent to which each of the following was observed in the classroom.		Percent Observed			Florida EETT			National Norm	
Independent seatwork	Baseline	13%	21%	65%	2.68	1.04	-1.00	2.41	0.98
	Spring	46%	32%	22%	1.69	1.02			
Experiential, hands-on learning	Baseline	74%	24%	3%	0.85	0.89	+0.45	1.20	1.00
	Spring	59%	19%	22%	1.35	1.26			
Systematic individual instruction	Baseline	97%	3%	0%	0.32	0.53	+0.14	0.44	0.76
	Spring	91%	6%	4%	0.39	0.9			
Sustained writing/composition	Baseline	91%	6%	3%	0.47	0.75	+0.13	0.75	0.86
	Spring	85%	13%	2%	0.65	0.78			
Sustained reading	Baseline	88%	6%	6%	0.53	0.86	+0.25	1.08	0.98
	Spring	85%	15%	0%	0.70	0.72			
Independent inquiry/research on the part of students	Baseline	85%	9%	6%	0.76	0.85	+0.63	0.32	0.65
	Spring	57%	26%	17%	1.43	1.02			
Student discussion	Baseline	68%	32%	0%	1.00	0.82	+0.10	0.89	1.11
	Spring	59%	33%	8%	1.09	1.07			
Technology Use									
Computer for instructional delivery (e.g. CAI, drill & practice)	Baseline	21%	56%	24%	2.09	0.90	-0.40	0.96	0.97
	Spring	39%	35%	26%	1.72	1.12			
Technology as a learning tool or resource	Baseline	59%	27%	15%	1.35	1.15	+0.61	0.80	0.98
	Spring	28%	35%	37%	2.15	1.07			
Assessment									
Performance assessment strategies	Baseline	94%	0%	6%	0.29	0.76	+0.23	0.50	0.83
	Spring	87%	7%	6%	0.52	0.86			
Student self-assessment	Baseline	91%	6%	3%	0.24	0.70	0.00	0.32	0.65
	Spring	98%	2%	0%	0.24	0.47			
Summary Items									
High academically focused class time	Baseline	6%	38%	56%	2.59	0.74	+0.61	3.33	0.80
	Spring	0%	19%	82%	3.04	0.64			
High level of student attention, interest, engagement	Baseline	15%	56%	29%	2.18	0.72	+1.00	3.12	0.83
	Spring	2%	26%	72%	2.91	0.73			

Scale: 0 = Not Observed; 1 = Rarely; 2 = Occasionally; 3 = Frequently; 4 = Extensively

TABLE C2. SOM Multi-Class Means Comparison between Fall and Spring Using Mantel-Haentzel Test

Item	QSMH	p	QCSMH	p
Instructional Orientation				
Direct instruction (lecture)	10.639*	0.001	10.639*	0.001
Team teaching	0.519	0.471	0.519	0.471
Cooperative/collaborative learning	6.721	0.010	6.721	0.010
Individual tutoring (teacher, peer, aide, adult volunteer)	2.045	0.153	2.045	0.153
Classroom Organization				

Item	QSMH	p	QCSMH	p
Ability groups	0.288	0.592	0.288	0.592
Multi-age grouping	2.253	0.133	2.253	0.133
Work centers (for individuals or groups)	0.828	0.363	0.828	0.363
Instructional Strategies				
Higher-level instructional feedback	0.865	0.352	0.865	0.352
Integration of subject areas (interdisciplinary/thematic units)	2.124	0.145	2.124	0.145
Project-based learning	13.627*	<.001	13.627*	<.001
Use of higher-level questioning strategies	2.139	0.144	2.139	0.144
Teacher acting as a coach/facilitator	9.459	0.0021	9.459	0.0021
Parent/community involvement in learning activities	0.441	0.507	0.441	0.507
Student Activities				
Independent seatwork	13.133*	<.001	13.133*	<.001
Experiential, hands-on learning	4.573	0.033	4.573	0.033
Systematic individual instruction	0.180	0.671	0.180	0.671
Sustained writing/composition (	0.636	0.425	0.636	0.425
Sustained reading	0.656	0.418	0.656	0.418
Independent inquiry/research on the part of students	10.565*	0.001	10.565*	0.001
Student discussion	1.323	0.250	1.323	0.250
Technology Use				
Computer for instructional delivery	2.760	0.097	2.760	0.097
Technology as a learning tool or resource	10.419*	0.001	10.419*	0.001
Assessment				
Performance assessment strategies	0.590	0.442	0.590	0.442
Student self-assessment	0.001	0.974	0.001	0.974
Summary Items				
High academically focused class time	9.486	0.0021	9.486	0.0021
High level of student attention/interest/engagement	16.988*	<.001	16.988*	<.001

*statistically significant at alpha<.0019

TABLE C3. Multi-Class SCU Data Summary

Computer Configuration	Baseline N=35	Spring N=54
Percentages of classrooms with the following numbers of computers or digital tools:		
None, one, or 2 -4	31%	7%
5 – 10	11%	20%
11 or more	57%	7,220%
Percentages of classrooms in which the majority of computers were:		
Up-to-date	74%	98%
Aging, but adequate	26%	0%
Outdated/limited capacity	0%	2%

Computer Configuration	Baseline N=35	Spring N=54
Percentages of classrooms in which the majority of computers were:		
Connected to the Internet	91%	93%

Student Computer Use	Baseline	Spring
Percentage of classrooms in which computers or digital tools were used by:		
Few (less than 10%) to Some (about 10-50%) students	29%	13%
Most (about 51-90%) students	34%	32%
Nearly all (91-100%) students	29%	52%
Percentage of classrooms in which students worked with computers or digital tools:		
Alone	89%	76%
In pairs or small groups	3%	19%
Percentage of classrooms in which student computer literacy skills were:		
Poor	6%	4%
Moderate	40%	32%
Very good	31%	46%
Not observed	23%	19%
Percentage of classrooms in which student keyboarding skills were:		
Poor	9%	2%
Moderate	40%	39%
Very good	14%	35%
Not observed	37%	24%

Digital Devices Used by Students		Not Observed	Occasionally	Frequently
Desktop Computers	Baseline	77%	14%	17%
	Spring	74%	19%	9%
Laptop Computers	Baseline	37%	26%	37%
	Spring	9%	17%	74%
Personal Data Assistants (PDA)	Baseline	100%	0%	0%
	Spring	98%	2%	0%
Graphing Calculator	Baseline	100%	0%	0%
	Spring	96%	4%	0%
Information Processor (e.g., Alphaboard)	Baseline	100%	0%	0%
	Spring	100%	0%	0%
Digital Accessories (e.g., camera, scanner, probes)	Baseline	94%	6%	0%
	Spring	78%	11%	11%

Note. Item percentages may not total 100% because of missing data.

Student Computer Activities		Percent Observed			Florida EETT			National Norm	
		None	Occ.	Freq.	M	SD	ES	M	SD
Production Tools Used by Students									
Word Processing	Baseline	72%	17%	11%	0.97	1.20	+0.32	0.50	0.90
	Spring	56%	19%	26%	1.44	1.33			
Database	Baseline	100%	0%	0%	0.00	0.00	+0.47	0.02	0.19
	Spring	98%	2%	0%	0.07	0.33			
Spreadsheet	Baseline	97%	3%	0%	0.14	0.43	+0.35	0.07	0.35
	Spring	89%	11%	0%	0.30	0.66			
Draw/Paint/Graphics	Baseline	94%	6%	0%	0.23	0.55	+0.70	0.19	0.57
	Spring	74%	15%	11%	0.80	1.12			
Presentation (e.g., MS PowerPoint)	Baseline	77%	17%	6%	0.77	1.03	+0.58	0.26	0.68
	Spring	56%	13%	32%	1.50	1.37			
Authoring (e.g., HyperStudio)	Baseline	94%	3%	3%	0.17	0.75	+0.25	0.02	0.20
	Spring	83%	11%	6%	0.43	0.90			
Concept Mapping (e.g., Inspiration)	Baseline	100%	0%	0%	0.20	0.41	+0.32	0.08	0.40
	Spring	89%	9%	2%	0.37	0.81			
Planning (e.g., MS Project)	Baseline	100%	0%	0%	0.00	0.00	+0.00	0.01	0.11
	Spring	100%	0%	0%	0.02	0.14			
Other	Baseline	94%	3%	3%	0.23	0.77	+0.49	0.10	0.46
	Spring	78%	9%	13%	0.72	1.19			
Internet/Research Tools Used by Students									
Internet Browser (e.g., Netscape)	Baseline	57%	29%	14%	1.23	1.17	+0.80	0.73	1.12
	Spring	33%	11%	56%	2.17	1.31			
CD Reference (encyclopedias, etc.)	Baseline	100%	0%	0%	0.09	0.28	+0.00	0.05	0.29
	Spring	98%	2%	0%	0.06	0.30			
Communications	Baseline	100%	0%	0%	0.03	0.17	+0.45	0.02	0.25
	Spring	94%	9%	0%	0.24	0.61			
Other	Baseline	94%	3%	3%	0.23	0.65	+0.26	0.09	0.45
	Spring	87%	4%	9%	0.41	0.94			
Educational Software Used by Students									
Drill/Practice/Tutorial	Baseline	66%	17%	17%	1.06	1.24	-0.27	0.73	1.06
	Spring	80%	13%	8%	0.76	1.01			
Problem Solving (e.g., SimCity)	Baseline	94%	6%	0%	0.14	0.49	+0.33	0.07	0.31
	Spring	91%	6%	4%	0.26	0.73			
Process Tools (e.g.,Geometer's Sketchpad)	Baseline	94%	3%	3%	0.17	0.75	+0.13	0.03	0.27
	Spring	87%	9%	4%	0.31	0.80			
Other	Baseline	97%	3%	0%	0.09	0.37	+0.32	0.21	0.66
	Spring	89%	6%	6%	0.30	0.82			

Student Computer Activities		Percent Observed			Florida EETT			National Norm	
Testing Software Used by Students									
Individualized/Tracked (e.g., Accelerated Reader)	Baseline	91%	6%	3%	0.26	0.70	+0.23	0.52	0.91
	Spring	83%	11%	6%	0.48	0.97			
Generic	Baseline	100%	0%	0%	0.03	0.17	+0.26	0.02	0.20
	Spring	98%	0%	2%	0.11	0.46			
Other	Baseline	94%	6%	0%	0.14	0.49	-0.26	0.08	0.41
	Spring	100%	0%	0%	0.04	0.19			
Meaningfulness of Computer Activities*									
Low level use of computers	Baseline	69%	9%	23%	1.17	1.32	-0.36	0.84	1.16
	Spring	80%	15%	6%	0.78	0.90			
Somewhat meaningful use of computers	Baseline	77%	23%	0%	0.86	0.77	+0.42	0.75	1.00
	Spring	48%	44%	8%	1.28	1.05			
Meaningful use of computers	Baseline	66%	26%	9%	0.94	1.06	+0.83	0.86	1.21
	Spring	41%	20%	39%	1.87	1.26			
Very meaningful use of computers	Baseline	91%	6%	3%	0.31	0.72	+0.77	0.39	0.88
	Spring	65%	13%	22%	1.11	1.31			

Scale: 0 = Not Observed; 1 = Rarely; 2 = Occasionally; 3 = Frequently; 4 = Extensively
Note. Item percentages may not total 100% because of missing data.

*Meaningfulness of Computer Activities Scale
1. **Low level use of computers:** activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.
2. **Somewhat meaningful use of computers**: activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.
3. **Somewhat meaningful use of computers**: 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.
4. **Very meaningful use of computers**: 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.

Computer Activities		Language	Math	Science	Soc St	Other	Not Observed
Production Tools	Baseline	37%	17%	34%	31%	6%	23%
	Spring	74%	30%	44%	41%	9%	6%
Internet/Research Tools	Baseline	26%	11%	31%	20%	3%	37%
	Spring	59%	22%	44%	43%	4%	15%
Educational Software	Baseline	37%	20%	9%	6%	3%	54%
	Spring	35%	39%	24%	15%	190%	35%
Testing Software	Baseline	20%	3%	3%	9%	0%	74%
	Spring	30%	20%	17%	11%	0%	54%

Note. Item percentages may not total 100% because of missing data or activities involving more than one subject area.

TABLE C4. SCU Multi-Class Means Comparison between Fall and Spring Using Mantel-Haentzel Test

Item	QSMH	p	QCSMH	p
Computer Configuration				
Classrooms most frequently had the following number of computers or digital tools	4.263*	0.039	4.263*	0.039
Classroom computers were most frequently	5.452*	0.020	5.452*	0.020
In classrooms, computers were most frequently	0.500	0.480	0.500	0.480
Total number of classrooms visited	0.973	0.324	0.973	0.324
Total number of classrooms without students using computers	10.028*	0.002	10.028*	0.002
Student Computer Use				
Classroom computers or digital tools were most frequently used by (1 = few, 2 = most, 3 = nearly all)	2.168	0.141	2.168	0.141
Students most frequently worked with computers/digital tools (1 = alone, 2 = pairs, 3 = groups)	0.312	0.576	0.312	0.576
Student computer literacy skills were most frequently (1 = poor, 2 = moderate, 3 = very good)	0.444	0.505	0.444	0.505
Student keyboarding skills were most frequently (1 = poor, 2 = moderate, 3 = very good)	0.108	0.743	0.108	0.743
Digital Devices used by Students				
Desktop computers.	0.961	0.327	0.961	0.327
Laptop computers.	14.612*	<.001	14.612*	<.001
Personal Data Assistants (PDA).	1.333	0.248	1.333	0.248
Graphing calculators.	3.800	0.051	3.800	0.051
Information Processors (e.g. Alphaboard).	0.143	0.706	0.143	0.706
Digital Accessories (e.g. camera, scanner, probes).	9.131	0.0025	9.131	0.0025
Production Tools Used by Students				
Word Processor	2.379	0.123	2.379	0.123
Database	1.455	0.228	1.455	0.228
Spreadsheet	0.852	0.356	0.852	0.356
Draw/Paint/Graphics/Photo-imaging	5.984	0.014	5.984	0.014
Presentation	4.880	0.027	4.880	0.027
Authoring	1.649	0.200	1.649	0.200
Concept Mapping	1.563	0.211	1.563	0.211
Planning (e.g. MS Project)	0.500	0.480	0.500	0.480
Other production tools	5.410	0.020	5.410	0.020
Internet/Research Tools Used by Students				
Internet Browser	9.192	0.0024	9.192	0.0024
CD Reference	1.400	0.237	1.400	0.237
Communications	5.079	0.024	5.079	0.024
Other Internet/Research Tools	2.551	0.110	2.551	0.110

Item	QSMH	p	QCSMH	p
Educational Software Used by Students				
Drill/Practice/Tutorial	6.203	0.013	6.203	0.013
Problem-Solving	0.287	0.592	0.287	0.592
Process Tools	0.681	0.409	0.681	0.409
Other educational software	4.268	0.039	4.268	0.039
Testing Software Used by Students				
Individualized/Tracked	1.130	0.288	1.130	0.288
Generic	0.435	0.510	0.435	0.510
Other testing software	2.380	0.123	2.380	0.123
Overall Meaningful Use of Computers				
Low level use of computers	4.047	0.044	4.047	0.044
Somewhat meaningful use of computers	1.330	0.249	1.330	0.249
Meaningful use of computers	10.780*	0.001	10.780*	0.001
Very meaningful use of computers	10.712*	0.001	10.712*	0.001

*Statistically significant at alpha<.0017

TABLE C5. Targeted School Observation Measure (SOM) Results

Fall (Baseline)   N = 38
Spring   N = 76

The extent to which each of the following was observed in the classroom.		Percent Observed			Florida EETT			National Norm	
		None	Occ.	Freq.	M	SD	ES	M	SD
Instructional Orientation									
Direct instruction (lecture)	Baseline	32%	13%	55%	2.37	1.46	-0.28	2.77	1.01
	Spring	42%	18%	39%	2.00	1.40			
Team teaching	Baseline	84%	3%	13%	0.58	1.33	+0.08	0.81	0.94
	Spring	79%	8%	13%	0.66	1.20			
Cooperative/collaborative learning	Baseline	68%	11%	21%	1.13	1.47	+0.58	1.08	0.98
	Spring	39%	7%	54%	1.97	1.61			
Individual tutoring (teacher, peer, aide, adult volunteer)	Baseline	87%	8%	5%	0.42	0.95	+0.30	0.77	0.94
	Spring	78%	9%	13%	0.71	1.09			
Classroom Organization									
Ability groups	Baseline	87%	0%	13%	0.50	1.31	+0.15	1.16	1.33
	Spring	80%	5%	15%	0.72	1.44			
Multi-age grouping	Baseline	92%	3%	5%	0.26	0.95	0.00	0.58	1.03
	Spring	91%	5%	4%	0.26	0.84			
Work centers (for individuals or groups)	Baseline	89%	0%	11%	0.42	1.18	0.00	1.35	1.14
	Spring	87%	4%	9%	0.36	0.93			

The extent to which each of the following was observed in the classroom.		Percent Observed			Florida EETT			National Norm	
Instructional Strategies									
Higher level instructional feedback (	Baseline	61%	11%	29%	1.37	1.46	+0.40	1.44	1.15
	Spring	34%	22%	43%	2.03	1.45			
Integration of subject areas (interdisciplinary/thematic units)	Baseline	92%	5%	3%	0.24	0.79	+0.87	0.54	0.80
	Spring	58%	8%	34%	1.33	1.56			
Project-based learning	Baseline	84%	0%	16%	0.58	1.31	+0.93	0.45	0.76
	Spring	41%	7%	53%	1.97	1.70			
Use of higher-level questioning strategies	Baseline	66%	16%	19%	1.03	1.33	+0.43	1.63	1.12
	Spring	51%	13%	36%	1.64	1.49			
Teacher acting as a coach/ facilitator	Baseline	37%	37%	26%	1.68	1.36	+0.69	2.29	1.18
	Spring	20%	18%	62%	2.58	1.24			
Parent/community involvement in learning activities	Baseline	95%	0%	5%	0.21	0.91	+0.11	0.31	0.60
	Spring	91%	3%	7%	0.32	0.91			
Student Activities									
Independent seatwork	Baseline	47%	18%	34%	1.71	1.54	-0.34	2.41	0.98
	Spring	63%	12%	25%	1.17	1.40			
Experiential, hands-on learning	Baseline	53%	21%	26%	1.34	1.49	+0.25	1.20	1.00
	Spring	49%	15%	37%	1.67	1.71			
Systematic individual instruction	Baseline	89%	0%	11%	0.42	1.18	+0.09	0.44	0.76
	Spring	86%	4%	11%	0.47	1.10			
Sustained writing/composition	Baseline	95%	5%	0%	0.13	0.47	+0.55	0.75	0.86
	Spring	86%	9%	5%	0.49	0.87			
Sustained reading	Baseline	95%	0%	5%	0.21	0.81	+0.44	1.08	0.98
	Spring	84%	9%	7%	0.55	1.00			
Independent inquiry/research on the part of students	Baseline	66%	11%	24%	1.11	1.64	+0.58	0.32	0.65
	Spring	37%	12%	51%	2.04	1.53			
Student discussion	Baseline	76%	3%	21%	0.97	1.42	+0.43	0.89	1.11
	Spring	43%	22%	34%	1.62	1.41			
Technology Use									
Computer for instructional delivery (e.g. CAI, drill & practice)	Baseline	32%	18%	50%	2.37	1.70	-0.48	0.96	0.97
	Spring	51%	13%	36%	1.58	1.59			
Technology as a learning tool or resource	Baseline	40%	21%	39%	1.97	1.64	+0.60	0.80	0.98
	Spring	16%	12%	72%	2.95	1.37			
Assessment									
Performance assessment strategies	Baseline	97%	3%	0%	0.11	0.39	+0.47	0.50	0.83
	Spring	84%	12%	4%	0.38	0.85			
Student self-assessment	Baseline	97%	0%	3%	0.11	0.65	+0.56	0.32	0.65
	Spring	80%	8%	12%	0.55	1.10			

The extent to which each of the following was observed in the classroom.		Percent Observed			Florida EETT			National Norm	
Summary Items									
High academically focused class time	Baseline	8%	21%	71%	3.08	1.08	0.00	3.33	0.80
	Spring	4%	24%	72%	3.12	0.91			
High level of student attention, interest, engagement	Baseline	16%	21%	63%	2.66	1.19	+0.38	3.12	0.83
	Spring	7%	17%	76%	3.12	0.92			

Scale: 0 = Not Observed; 1 = Rarely; 2 = Occasionally; 3 = Frequently; 4 = Extensively

TABLE C6. SOM Targeted Means Comparison between Fall and Spring Using Mantel-Haentzel Test

Item	QSMH	p	QCSMH	p
Instructional Orientation				
Direct instruction (lecture)	0.414	0.520	0.414	0.520
Team teaching	0.274	0.600	0.274	0.600
Cooperative/collaborative learning	8.022	0.005	8.022	0.005
Individual tutoring (teacher, peer, aide, adult volunteer)	1.080	0.299	1.080	0.299
Classroom Organization				
Ability groups	0.058	0.810	0.058	0.810
Multi-age grouping	0.107	0.744	0.107	0.744
Work centers (for individuals or groups)	3.990	0.046	3.990	0.046
Instructional Strategies				
Higher-level instructional feedback (written or verbal) to enhance student learning	9.186	0.002	9.186	0.002
Integration of subject areas (interdisciplinary/thematic units)	16.076*	<.001	16.076*	<.001
Project-based learning	16.848*	<.001	16.848*	<.001
Use of higher-level questioning strategies	7.900	0.005	7.900	0.005
Teacher acting as a coach/facilitator	10.608*	0.001	10.608*	0.001
Parent/community involvement in learning activities	0.178	0.673	0.178	0.673
Student Activities				
Independent seatwork	7.438	0.006	7.438	0.006
Experiential, hands-on learning	1.331	0.249	1.331	0.249
Systematic individual instruction	2.350	0.125	2.350	0.125
Sustained writing/composition	3.597	0.058	3.597	0.058
Sustained reading	0.910	0.340	0.910	0.340
Independent inquiry/research on the part of students	11.258*	<.001	11.258*	<.001
Student discussion	6.498	0.011	6.498	0.011
Technology Use				
Computer for instructional delivery (e.g., CAI, drill & practice)	3.763	0.052	3.763	0.052

Item	QSMH	p	QCSMH	p
Technology as a learning tool or resource	10.320*	0.001	10.320*	0.001
Assessment				
Performance assessment strategies	1.048	0.306	1.048	0.306
Student self-assessment (portfolios, individual record books)	2.667	0.102	2.667	0.102
Summary Items				
High academically focused class time	0.987	0.321	0.987	0.321
High level of student attention/interest/engagement	6.290	0.012	6.290	0.012

statistically significant at alpha<.0019

TABLE C7. Targeted SCU Data Summary

Computer Configuration	Baseline (N=37)	Spring (N=70)
Percentages of classrooms with the following numbers of computers or digital tools:		
None; One, or 2 -4	22%	3%
5 – 10	14%	10%
11 or more	65%	87%
Percentages of classrooms in which the majority of computers were:		
Up-to-date	81%	99%
Aging, but adequate	11%	1%
Outdated/limited capacity	3%	0%
Percentages of classrooms in which the majority of computers were:		
Connected to the Internet	84%	97%
Student Computer Use	**Baseline**	**Spring**
Percentage of classrooms in which computers or digital tools were used by:		
Few (less than 10%) to Some (about 10-50%) students	16%	10%
Most (about 51-90%) students	3%	10%
Nearly all (91-100%) students	62%	71%
Percentage of classrooms in which students worked with computers or digital tools:		
Alone	70%	71%
In pairs or small groups	11%	23%
Percentage of classrooms in which student computer literacy skills were:		
Poor	8%	0%
Moderate	43%	26%
Very good	19%	56%
Not observed	30%	19%
Percentage of classrooms in which student keyboarding skills were:		
Poor	19%	1%
Moderate	32%	37%
Very good	16%	36%
Not observed	32%	26%

Digital Devices Used by Students		Not or Rarely Observed	Occasionally	Frequently or Extensively
Desktop Computers	Baseline	100%	0%	0%
	Spring	77%	13%	10%
Laptop Computers	Baseline	27%	11%	62%
	Spring	24%	4%	71%
Personal Data Assistants (PDA)	Baseline	97%	0%	3%
	Spring	94%	3%	3%
Graphing Calculator	Baseline	100%	0%	0%
	Spring	94%	1%	4%
Information Processor (e.g., Alphaboard)	Baseline	100%	0%	0%
	Spring	99%	1%	0%
Digital Accessories (e.g., camera, scanner, probes)	Baseline	97%	0%	3%
	Spring	77%	7%	16%

Note. Item percentages may not total 100% because of missing data.

Student Computer Activities		Percent Observed			Florida EETT			National Norm	
		None	Occ.	Freq.	Mean	SD	ES	M	SD
Production Tools Used by Students									
Word Processing	Baseline	65%	8%	27%	1.22	1.65	0.00	0.50	0.90
	Spring	63%	7%	30%	1.17	1.54			
Database	Baseline	97%	0%	3%	0.11	0.52	-0.28	0.02	0.19
	Spring	100%	0%	0%	0.00	0.00			
Spreadsheet	Baseline	95%	0%	5%	0.16	0.69	-0.16	0.07	0.35
	Spring	96%	0%	3%	0.10	0.51			
Draw/Paint/Graphics	Baseline	87%	8%	5%	0.38	1.04	+0.27	0.19	0.57
	Spring	76%	10%	14%	0.74	1.24			
Presentation (e.g., MS PowerPoint)	Baseline	87%	3%	11%	0.43	1.14	+0.73	0.26	0.68
	Spring	54%	10%	36%	1.43	1.57			
Authoring (e.g., HyperStudio)	Baseline	97%	0%	3%	0.11	0.66	+0.13	0.02	0.20
	Spring	94%	0%	6%	0.23	0.84			
Concept Mapping (e.g., Inspiration)	Baseline	92%	3%	5%	0.27	0.87	0.00	0.08	0.40
	Spring	93%	1%	6%	0.29	0.92			
Planning (e.g., MS Project)	Baseline	100%	0%	0%	0.00	0.00	0.00	0.01	0.11
	Spring	100%	0%	0%	0.00	0.00			
Other	Baseline	97%	0%	3%	0.11	0.52	+0.67	0.10	0.46
	Spring	74%	4%	21%	0.81	1.41			
Internet/Research Tools Used by Students									
Internet Browser (e.g., Netscape)	Baseline	65%	14%	22%	1.19	1.54	+0.64	0.73	1.12
	Spring	34%	10%	56%	2.20	1.60			

Student Computer Activities		Percent Observed			Florida EETT			National Norm	
CD Reference (encyclopedias, etc.)	Baseline	100%	0%	0%	0.05	0.23	-0.71	0.05	0.29
	Spring	100%	0%	0%	0.00	0.00			
Communications	Baseline	100%	0%	0%	0.00	0.00	+0.35	0.02	0.25
	Spring	99%	0%	1%	0.07	0.39			
Other	Baseline	87%	5%	8%	0.46	1.02	-0.21	0.09	0.45
	Spring	89%	4%	7%	0.33	0.91			
Educational Software Used by Students									
Drill/Practice/Tutorial	Baseline	95%	0%	5%	0.19	0.81	+0.13	0.73	1.06
	Spring	90%	3%	7%	0.31	0.84			
Problem Solving (e.g., SimCity)	Baseline	97%	3%	0%	0.05	0.33	0.00	0.07	0.31
	Spring	97%	0%	3%	0.11	0.53			
Process Tools	Baseline	95%	0%	5%	0.19	0.81	+0.12	0.03	0.27
	Spring	90%	1%	9%	0.30	0.87			
Other	Baseline	89%	0%	11%	0.38	1.11	-0.21	0.21	0.66
	Spring	94%	0%	6%	0.21	0.83			
Testing Software Used by Students									
Individualized/Tracked (e.g., Accelerated Reader)	Baseline	97%	0%	3%	0.14	0.67	+0.13	0.52	0.91
	Spring	91%	1%	7%	0.24	0.81			
Generic	Baseline	100%	0%	0%	0.00	0.00	0.00	0.02	0.20
	Spring	100%	0%	0%	0.00	0.00			
Other	Baseline	97%	0%	3%	0.11	0.66	0.00	0.08	0.41
	Spring	97%	0%	3%	0.09	0.50			
Meaningfulness of Computer Activities*									
Low level use of computers	Baseline	73%	5%	22%	1.00	1.56	-0.39	0.84	1.16
	Spring	86%	10%	4%	0.54	0.90			
Somewhat meaningful use of computers	Baseline	68%	22%	11%	0.78	1.13	+0.33	0.75	1.00
	Spring	61%	21%	17%	1.16	1.28			
Meaningful use of computers	Baseline	73%	3%	24%	0.97	1.44	+0.64	0.86	1.21
	Spring	37%	13%	50%	1.94	1.43			
Very meaningful use of computers	Baseline	81%	5%	14%	0.57	1.24	+0.49	0.39	0.88
	Spring	66%	7%	27%	1.27	1.55			

Scale: 0 = Not Observed; 1 = Rarely; 2 = Occasionally; 3 = Frequently; 4 = Extensively

Note. Item percentages may not total 100% because of missing data.

Meaningfulness of Computer Activities Scale

1. Low level use of computers: activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.

2. Somewhat meaningful use of computers: activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.

3. Somewhat meaningful use of computers: 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.

4. Very meaningful use of computers: 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.

Subject Areas of Computer Activities		Language	Math	Science	S. Studies	Other	Not Observed
Production Tools	Baseline	22%	8%	24%	11%	3%	35%
	Spring	44%	19%	39%	27%	11%	11%
Internet/Research Tools	Baseline	8%	5%	19%	5%	3%	68%
	Spring	36%	14%	31%	21%	9%	21%
Educational Software	Baseline	8%	5%	5%	0%	3%	81%
	Spring	16%	11%	13%	13%	0%	56%
Testing Software	Baseline	5%	8%	5%	3%	0%	84%
	Spring	11%	3%	10%	11%	0%	69%

Note. Item percentages may not total 100% because of missing data or activities involving more than one subject area.

TABLE C8. SCU Targeted Means Comparison between Fall and Spring Using Mantel-Haentzel Test

Item	QSMH	p	QCSMH	p
Computer Configuration				
Classrooms most frequently had the following number of computers or digital tools (1 = None, 2= One, 3= 2-4, and 4 = No computers were observed)	10.119*	0.0015	10.119*	0.0015
Classroom computers were most frequently (1 = Up-to-date, 2= Aging but adequate, 3= Outdated/limited capacity, and 4 = No computers were observed)	8.487*	0.004	8.487*	0.004
In classrooms, computers were most frequently (1 = Connected to the Internet, 2 = Not connected to the Internet, and 3 = No computers were observed)	5.744*	0.017	5.744*	0.017
Total number of classrooms visited	1.990	0.158	1.990	0.158
Total number of classrooms without students using computers	0.248	0.619	0.248	0.619
Student Computer Use				
Classroom computers or digital tools were most frequently by (1 = few, 2 = most, 3 = nearly all)	0.003	0.960	0.003	0.960
Students most frequently worked with computers/digital tools (1 = alone, 2 = pairs, 3 = groups)	0.192	0.662	0.192	0.662
Student computer literacy skills were most frequently (1 = poor, 2 = moderate, 3 = very good)	2.329	0.127	2.329	0.127
Student keyboarding skills were most frequently (1 = poor, 2 = moderate, 3 = very good)	3.084	0.079	3.084	0.079
Digital Devices used by Students				
Desktop computers.	6.810	0.009	6.810	0.009
Laptop computers.	0.063	0.802	0.063	0.802

Item	QSMH	p	QCSMH	p
Personal Data Assistants (PDA).	0.615	0.433	0.615	0.433
Graphing calculators.	3.046	0.081	3.046	0.081
Information Processors (e.g. Alphaboard).	0.033	0.855	0.033	0.855
Digital Accessories (e.g. camera, scanner, probes).	5.539	0.019	5.539	0.019
Production Tools Used by Students				
Word Processor	1.081	0.299	1.081	0.299
Database	1.899	0.168	1.899	0.168
Spreadsheet	0.118	0.732	0.118	0.732
Draw/Paint/Graphics/Photo-imaging	0.472	0.492	0.472	0.492
Presentation	9.049	0.003	9.049	0.003
Authoring	0.371	0.543	0.371	0.543
Concept Mapping	0.028	0.867	0.028	0.867
Planning (e.g. MS Project)	-	-	-	-
Other production tools	14.781*	<.001	14.781*	<.001
Internet/Research Tools Used by Students				
Internet Browser	5.486	0.019	5.486	0.019
CD Reference	5.628	0.018	5.628	0.018
Communications	0.400	0.527	0.400	0.527
Other Internet/Research Tools	0.310	0.578	0.310	0.578
Educational Software Used by Students				
Drill/Practice/Tutorial	0.048	0.827	0.048	0.827
Problem-Solving	0.215	0.643	0.215	0.643
Process Tools	0.015	0.902	0.015	0.902
Other educational software	0.435	0.510	0.435	0.510
Testing Software Used by Students				
Individualized/Tracked	0.022	0.881	0.022	0.881
Generic	-	-	-	-
Other testing software	0.030	0.862	0.030	0.862
Overall Meaningful Use of Computers				
Low level use of computers	7.450	0.006	7.450	0.006
Somewhat meaningful use of computers	0.417	0.519	0.417	0.519
Meaningful use of computers	13.384*	<.001	13.384*	<.001
Very meaningful use of computers	6.571	0.010	6.571	0.010

*Statistically significant at alpha<.0017

Miami-Dade

Seventeen teachers from one school in Dade County participated in the *Leveraging Laptops* Program, and 16 (response rate of 94%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, the school was observed using the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance data from three classrooms was provided as a result of three completed teacher inquiry projects.

Setting

Teachers involved with the *Leveraging Laptops* Program from Dade County reported an average of 24.5 (SD=6.2) students per class. The teachers reported an average of 14.4 (SD= 14.77) laptops and average of 6.38 (SD=9.46) desktops in their classrooms. Two teachers reported teaching Art/Music, 1 in Media/Technology, 2 in English, 1 in special education, 3 in mathematics, 2 in reading, 2 in science, 4 in social science, 1 in vocational education, and 1 reported other.

Technology Used

Teachers in Dade County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, database, presentation, and Internet browsing software one or more times a week. Authoring, spreadsheets, draw/paint/graphic, and concept mapping software packages were used much less frequently by teachers. Thirty percent or more teachers reported their students used word processing, presentation, and Internet browsing software at least once a week. Thirty percent or more teachers reported their students do not use spreadsheets, databases, authoring, or concept mapping software packages at all. Draw/paint/graphic has moderate student use.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, CD reference, blogging, wiki, drill/practice/tutorial, problem-solving and testing software at least once a week. More than 30% of teachers reported not using process tools, ebooks, and podcasting software at all. Fifty percent of teachers or more reported that their students use drill/practice/tutorial, and problem-solving software once a week or more. Thirty-five percent of teachers or more report their students do not use planning, CD reference, blogging, wiki, process tools, ebook or podcasting software at all.

Teacher use of digital production software is frequent in Dade County, but student use is much less frequent. Fifty percent of teachers or more report using digital audio, video, podcasting, and graphics organizer software one or more times a week. Forty percent or more teachers report never using digital story-telling software. Thirty-five percent or more teachers report their students never use digital audio, video, podcasting, or digital story telling software. According to 30% or more of the teachers, students use graphics organizers software at least once a week.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Dade County had different paths to professional certification. Six teachers came from approved college degree programs, 5 teacher earned college course certification, and 5 earned district alternative certification.

Teachers reported an average of 11.63 (SD= 7.5) years in the education profession, and an average of 4.67 (SD= 5.25) years of using computers in their classrooms for the delivery of instruction. Eight teachers reported teaching 6th grade, 13 taught 7th grade, and 10 taught 8th grade.

Teachers involved were certified to teach in many areas including Art K-12 (1), Biology 6-12 (2), Drama 6-12 (1), Ed. Media Specialist PK-12 (1), English 6-12 (1), ESOL (2), Exceptional Student Ed. K-12 (3), Technology Education 6-12 (1), Mathematics 6-12 (1), Middle Grade English 5-9 (1), Middle Grade Mathematics 5-9 (1), Middle Grade Social Sciences 5-9 (2), Music K-12 (1), Reading K-12 (1), and Social Sciences 6-12 (3).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table D.A1 shows the responses.

Table D.A1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	0%	13%	44%	31%	13%
Professional Development	6%	19%	13%	63%	0%
Independent learning	13%	25%	31%	31%	0%
Interaction with other faculty/staff	6%	50%	13%	31%	0%
Distance Learning courses	0%	25%	13%	6%	56%
Teaching and Learning Summer Institute	0%	13%	44%	31%	13%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table D.A2 illustrates the responses. Overall attitudes were positive. Sixty-five percent or more of the teachers either strongly agree or agree with each of the positively stated categories.

Table D.A2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	19%	38%	44%
encourage me collaborate with my colleagues on technology integration.	0%	0%	0%	62%	38%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	0%	31%	50%	19%
help me think about how technology may change my teaching practices.	0%	0%	6%	56%	38%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	0%	13%	50%	38%
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	0%	69%	31%
focus on both the technical and instructional skills required to integrate technology.	0%	0%	24%	38%	38%
are traditionally in the form of after school workshops.			13%	50%	38%
are consistent and continual.	6%	13%	6%	50%	25%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table D.A3 illustrates the responses. Fifty percent or more of teachers involved with the program in Dade County report using computers for direct instruction, cooperative /collaborative learning, project-based learning, independent inquiry/research, instructional delivery, as a learning tool/resource, and student assessment one or more times a week.

Table D.A3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	6%	0%	38%	0%	31%	19%
For team teaching	25%	38%	19%	0%	19%	0%
For cooperative /collaborative learning	6%	19%	6%	19%	44%	6%
In centers	25%	44%	6%	0%	13%	13%
For project-based learning	6%	6%	25%	19%	38%	6%
For sustained writing	25%	38%	25%	13%	0%	0%
For sustained reading	19%	50%	6%	6%	6%	13%
For independent inquiry/research	6%	6%	25%	38%	19%	6%
For student discussion/ communication	6%	38%	25%	19%	13%	0%
For instructional delivery	6%	0%	25%	31%	19%	19%
As a learning tool/resource	6%	0%	13%	38%	19%	25%
For student assessment	0%	31%	19%	13%	19%	19%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All teachers responded that their schools had on-site computer support specialists. In the school involved with the *Leveraging Laptops* Program in Dade County, teachers report 1-4 (an inconsistency since only one school was involved) technical support staff members were available. Most reported three support members were available. Eighty-one percent of the teachers reported the staff was full-time, and 31% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table D.A4.

Table D.A4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	6%	0%	19%	25%	50%
The on-site computer specialist is dedicated to helping teachers.	6%	0%	38%	13%	44%
I have adequate access to our on-site computer specialist.	13%	6%	13%	25%	44%
I have to contact our specialist several times before I get assistance.	6%	38%	19%	19%	19%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	6%	13%	31%	13%	38%

Student Achievement

The three teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table D.A5

Table D.A5. Dade teacher inquiry summaries

Context	– 7th grade science using virtual labs – 63% of students are below level in reading. – 72% of students are below level in math
AR Question	– Does supplementation of science lessons using virtual labs correlate to higher scores on benchmark exams for students in 7th grade science classes? – Does technology increase students' ability to organize, analyze and present collected data and information?
Data Collection Methods	– Test scores – Student Artifacts – Informal Interviews – Rubrics

Results	– Scores increased when students were exposed to the concepts in a fun and visual way. – More knowledgeable discussion of ideas and information ensued after the completion of the online/virtual activities. – Students did a better job of compiling data and presenting and discussing findings. – Students demonstrated a greater sense of pride in their work. – Computer use dramatically increased the number and quality of projects/reports – Student reports were better organized, neater, and more accurate than those prepared by students who continued to use textbooks
Other Outcomes	– Students learned cooperative and team working skills. – Supplemental science lessons helped support students who are absent catch up. – The school will add computers to math/science classrooms. – AR teacher will assist in training science teachers and will attend summer workshops to continue personal professional development.

Context	– 7th grade literature using Inspiration	
AR Question	– Does the use of Inspiration to deconstruct text lead to better comprehension and retention of literature in a seventh grade class?	
Data Collection Methods	– Test scores	
Results	– Test scores improved	
	2nd Q	4th Q
	A: 18	*A:* 33
	B: 26	*B:* 22
	C: 26	*C:* 26
	D: 8	*D:* 15
	F: 22	*F:* 4
	– Percentage of students earning each grade	
Other Outcomes	– The class environment was productive and students effectively collaborated with each other. – Use of technology was efficient and cut the time required for review in half.	

Context	– Mix of 6, 7 and 8th grade students from one school
AR Question	– Does creative computer projects and growing technology skills cause an increase in student confidence and enjoyment of school?
Data Collection Methods	– Survey

Results	– More tech-using students feel school prepares them for a good future, enjoy school, and have made projects they are proud of.		
		Laptop	No-laptops
	Feeling school is preparing them for the future	*71%*	*49%*
	Generally enjoys school	*67%*	*48%*
	Have made projects they are proud of	*72%*	*44%*

Escambia

Forty-three teachers from five different schools in Escambia County participated in the *Leveraging Laptops* Program, and 43 (response rate of 100%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.
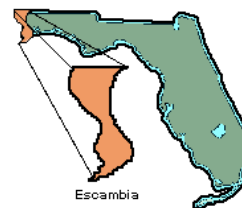
Setting

Teachers involved with the *Leveraging Laptops* Program from Escambia County reported an average of 17.5 (SD=6.31) students per class. The teachers reported an average of 14.37 (SD=8.53) laptops and average of 6.65 (SD=8.12) desktops in their classrooms.

Two teachers reported teaching art/music, 4 in media/technology, 20 in English, 6 in special education, 20 in mathematics, 22 in reading, 18 in science, 22 in social studies, 1 in vocational education, and 1 reported other. One teacher reported teaching Pre-Kindergarten-K, 7 taught Kindergarten, 10 taught 1st grade, 10 taught 2nd grade, 16 taught 3rd grade, 12 taught 4th grade, 9 taught 5th grade, 9 taught 6th grade, 6 taught 7th grade, 9 taught 8th grade, 1 taught 9th grade, 1 taught 10th grade, 1 taught 11th grade, 1 taught 12th grade, and 1 taught adult education.

Technology Used

Teachers in Escambia County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, draw/paint/graphic, presentation, and Internet browsing software one or more times a week. Authoring, database, spreadsheet, and concept mapping software packages were used less frequently by teachers (25% teachers or more reported not at all, except concept mapping at 19%). Fifty percent or more teachers reported their students use word processing, draw/paint/graphic, and Internet browsing software at least once a week or more. Thirty percent or more teachers report their students do not use concept mapping, database, or spreadsheet software packages at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, blogging, wiki, drill/practice/tutorial, problem-solving, testing, and CD reference at least once a week. More than 40% of teachers reported not using process tools at all. Ebook and podcasting software were used less frequently by teachers. Fifty percent of teachers or more reported that their students use drill/practice/tutorial, and testing software one or more times a week. Forty percent or more teachers report their students do not use planning, CD reference, blogging, wiki and process software packages at all.

When looking at digital production software, both student and teacher use is much less frequent. Twenty percent of teachers or more report using digital audio, podcasting, graphics organizer software packages at least once a week. Teacher use of digital video and digital story telling software packages is much less frequent. Forty percent or more teachers report their students never use digital video or digital story telling

software packages. Graphics organizers, digital audio, and podcasting software packages were use more frequently, but most teachers report less than once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Escambia County had different paths to professional certification. Twenty-two teachers came from approved college degree programs, 11 teacher earned college course certification, and 10 transferred from other states. Teachers reported an average of 16.06 (SD=8.92) years in the education profession, and an average of 5.49 (SD= 4.78) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Art K-12 (3), Professional Education (3), Ed. Media Specialist PK-12 (1), Elementary Education K-6 (28), ESOL (2), Exceptional Student Ed. K-12 (9), Guidance and Counseling PK-12 (1), Technology Education K-12 (2), Middle Grades Integrated Curriculum (1), Reading K-12 (2), Pre-Kindergarten/Primary PK-3 (4), Social Sciences 6-12 (3), and Speech-Language Impaired K-12 (1).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	2%	9%	30%	56%	2%
Professional Development	40%	30%	21%	9%	0%
Independent learning	0%	23%	26%	49%	2%
Interaction with other faculty/staff	0%	7%	49%	42%	2%
Distance Learning courses	0%	7%	49%	42%	2%
Teaching and Learning Summer Institute	54%	23%	16%	5%	0%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Eighty percent or more of the teachers either strongly agree or agree to each of the positively stated categories with the exception that professional development opportunities are traditionally in the form of after school workshops.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	5%	2%	0%	51%	42%
encourage me collaborate with my colleagues on technology integration.	5%	0%	2%	47%	47%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	5%	2%	7%	44%	42%
help me think about how technology may change my teaching practices.	2%	2%	5%	40%	49%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	2%	2%	2%	49%	42%
encourage me to consider how technology can be used to facilitate student learning of content.	5%	2%	5%	42%	4,650%
focus on both the technical and instructional skills required to integrate technology.	2%	9%	2%	42%	44%
are traditionally in the form of after school workshops.	5%	5%	16%	54%	21%
are consistent and continual.	5%	2%	12%	58%	23%

Teaching and Instructional Practices: Student-Centered and Tool-based Teaching Practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Escambia County report using computers for direct instruction, cooperative /collaborative learning, in centers, project-based learning, independent inquiry/research, instructional delivery, as a learning tool/resource, and student assessment one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	7%	7%	16%	40%	30%
For team teaching	16%	35%	14%	12%	12%	5%
For cooperative /collaborative learning	0%	5%	14%	40%	28%	14%
In centers	0%	19%	7%	14%	19%	40%
For project-based learning	0%	5%	37%	19%	26%	14%
For sustained writing	5%	28%	19%	28%	19%	2%
For sustained reading	5%	23%	19%	16%	30%	7%
For independent inquiry/research	2%	9%	23%	28%	21%	14%
For student discussion/ communication	5%	35%	16%	21%	21%	2%

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For instructional delivery	0%	16%	16%	5%	33%	30%
As a learning tool/resource	0%	7%	5%	12%	30%	44%
For student assessment	0%	16%	33%	21%	23%	7%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. Ninety-five percent of the teachers responded that their schools had on-site computer support specialists. In the schools involved with the *Leveraging Laptops* Program in Escambia County, 0-4 technical support staff members were available with most teachers reporting having 1 available. Seventy-seven percent of the teachers reported the staff was full-time, and only 9% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	5%	7%	16%	30%	42%
The on-site computer specialist is dedicated to helping teachers.	2%	7%	14%	19%	58%
I have adequate access to our on-site computer specialist.	7%	12%	9%	28%	44%
I have to contact our specialist several times before I get assistance.	30%	28%	21%	12%	9%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	23%	5%	14%	21%	37%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry project summaries

Context	– 3rd grade writing and behavior with Audacity. – Student is labeled as Obsessive Compulsive, Oppositional Defiant, Emotional Handicapped, and speech impaired
AR Question	– How does the use of Audacity for brainstorming and Kidspiration for outlining influence the quality of writing produced and classroom behavior exhibited by a 3rd grade student with emotional needs?

Data Collection Method	– 6-Traits Writing Rubric – Student Artifacts – Anecdotal Records
Results	– David's (pseudonym) writing score averaged a 3.5 throughout first and second grade. This year he made a score of a 4. Also, he scored a Level 5 in reading and a Level 4 in math on his FCAT tests. – David's number of referrals decreased from three to four referrals each year to zero during this study. – His conferences with the principal decreased from 4 to zero during this study. – He did not have to be pulled out of the classroom due to disruptions. No CPI holds had to be used on him this school year. – As time progressed, David started coming in with writing prompts in his mind and asking if he could get on his laptop and write his ideas. Many times he would come up with ideas that we could do on the laptops to demonstrate what they learned he would write his emotions and thoughts when he was upset. Sometimes he wrote funny stories about other students to get him laughing. He would beg me to allow him to read it to the class. David started to have an affect on my class. – More of my students started to ask me if they could write on the computer and do the same thing as him. As a result, this became our daily writing time on our computers. – He enjoyed recording his ideas into Audacity. He often expressed that when he records his ideas it allowed him to get everything off his chest and get all of his thoughts somewhere before he forgets it. He said that his writing sometimes were messy because he quickly wanted to get all of his ideas down before he forgets the ideas.
Other Outcomes	– There were some amazing changes to his IEP due to progress related to this inquiry. His occupational therapist put him on consult instead of therapy once a week. She felt like the laptops opened doors for David and as long as this was provided for him he will excel. – I placed him in the general education classroom for ninety minutes of reading with computers available for him. David could be fully mainstreamed but we still deal with him not getting his medication daily and homework not getting done. – I learned that it is imperative that I involve technology due to the severity of my students. These are the students that will depend on computers to help them become productive citizens in our society. I found that if you give them the prerequisite skills, computers may be an assistive technology that can help them be successful. I found that technology enhances motivation, improves behaviors, and the quality of work produced. The students often did more than what was expected of them. I had more writing assignments turned in when it was done on the computer compared to when they wrote them on paper. I am flabbergasted by the difference these laptops had on my students. – Technology can be a tool to help with children with behavioral problems. It is important that we teachers find out what is the underlying reason for the behaviors. It could simply be frustration in a certain subject that can be alleviated with computers.

Context	– 3rd grade reading with online program
AR Question	– Will the use of a supplemental online reading program, (Headsprout Early Reading Program), improve the decoding skills of five, third grade, struggling readers?

Data Collection Methods	– Test scores
Results	– Students mastered the skills on the Headsprout program with 97% accuracy. – The mastery of the skills did not impact their reading ability when it came to connected text. The learners did not show a significant change in their reading levels based on the star test. – I think this program may have a positive impact on students decoding skills if you start the program at the beginning of the year.
Other Outcomes	– I can conclude that research on my initial question needs to be conducted for a longer period of time. – I am planning to use this program next year with my struggling first graders. I will definitely want to start this program at the beginning of the year. – I will look into funding through grants or the school to purchase this program for my struggling readers.

Context	– 2nd grade writing with laptops
AR Question	– How will letting 18 second grade students write on their laptops, instead of pencil and paper, affect their writing skills and motivation?
Data Collection Methods	– Test scores – Student artifacts – Anecdotal records – Rubrics
Results	– Out of the 18 students in my class, 12 of them got a lower average score on the laptop writing, 2 got exactly the same average score, and 4 students got a higher average score. – For the 12 students scoring lower, the average drop was .64 points (using the state 6-point rubric). The average rise for the students scoring higher was .21 points. – Student ability and writing skill made no difference in the results of this inquiry. – Though the students were normally enthusiastic about working on the laptops, they were not enthused about word processing. This was in sharp contrast to the enthusiastic response when the students used the laptops to do research, create presentations, compose music, or play learning games.
Other Outcomes	– Typing is more arduous for second graders, even the best typists at this age are only up to 8-10 wpm. Also, they are not yet proficient with word processing skills. For most students the difficulty of word processing adversely affects writing scores.

Context	– 1st grade reading with reading activities
AR Question	– Will a strategy of utilizing laptop computers to provide daily and individualized access to interactive computer reading activities support the growth of fluency and vocabulary skills for struggling, low socio-economic 1st grade readers?
Data Collection Methods	– Test scores (DIBELS) – Student artifacts
Results	– This particular class outperformed all other first grade classes on average within the school. – The use of computers in this class leveled the field and provided the support necessary for the very high-risk students.

Other Outcomes	– Laptop carts that once went unused are now hot items to be checked out in 2-hour increments. It is my hope that the state and district find classrooms that are using the technology appropriately, see the positive results, and continue to support technology integration in our classrooms.
	– Laptops can be an effective intervention and support for reading. It is imperative that the laptops be used along with reading instruction. Fancy software is not necessarily the key. Students in this class used free internet sites and iLife applications to enrich and support the reading instruction

Context	– Middle school speech impaired with Audacity
AR Question	– Will use of the auditory capture/feedback program Audacity enable three students with fluency or articulation errors (identified Speech Language Impaired for Fluency or Articulation) to decrease in number the occurrences of disfluencies in reading and/or conversational speech?
Data Collection Methods	– Student artifacts
	– Anecdotal records
	– Field notes
Results	– In the timeline given, there is not definitive change to be seen. The most telling for me (in terms of validity of use in my classes) is in the positive anecdotal reports of students answering my queries as to whether or not the use of Audacity helps(ed) them.
	– Audacity (or any other audio recording device that enables students to see a visual production of sound, as well as hear an audio) is a valid tool to use in helping students bring about change in the way they speak.
Other Outcomes	– My district level Speech Language Impaired Staffing Specialist was very impressed watching my students work on Audacity.
	– I provided the information on how other therapists could download and use it with their students.

Gadsden

Seventeen teachers from three different schools in Gadsden County participated in the *Leveraging Laptops* Program, and 14 (response rate of 82%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of five teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.
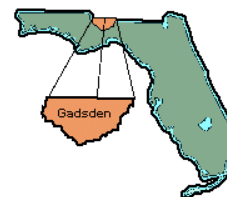
Setting

Teachers involved with the *Leveraging Laptops* Program from Gadsden County reported an average of 19.43 (SD=6.36) students per class. The teachers reported an average of 20.67 (SD=7.23) laptops and average of 6.86 (SD=8.64) desktops in their classrooms. Four teachers reported currently teaching English, 2 in mathematics, 1 in reading, 3 in science, 3 in social studies, and 1 reported other.

Teachers from all school levels participated in the program. One teacher reported teaching Pre-K, 1 taught Kindergarten, 1 taught 1st grade, 1 taught 2nd grade, 3 taught 6th grade, 3 taught 7th grade, 13 taught 8th grade, 1 taught 9th grade, 1 taught 10th grade, 1 taught 11th grade, 1 taught 12th grade, and 1 taught adult education.

Technology Used

Teachers in Hendry County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, spreadsheets, Draw/paint/graphics, presentation, and Internet browsing one or more times a week. Authoring, database, and concept mapping software packages were used much less frequently by teachers. Fifty percent or more teachers reported their students use word processing, draw/paint/graphic, presentation, and Internet browsing software at least once a month or more. Fifty percent or more teachers reported their students did not use spreadsheet, database, authoring, and concept mapping software at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, problem-solving, and CD reference software at least once a month or more. More than 50% of teachers reported not using blogging, wiki, process tools, testing, ebooks, and podcasting software at all. Teachers reported that more than 50% of their students did not use planning, CD reference, blogging, wiki, Drill/practice/tutorial, problem-solving, process tools, testing, ebook, or podcasting software at all.

When looking at digital production software, both student and teacher use is much less frequent. Forty percent of teachers or more report using digital audio, video, and graphics organizer software packages at least once a month. Fifty percent or more teachers report never use podcasting or digital story-telling software packages. Sixty percent or more teachers report their students never use digital audio, video, podcasting, and digital story telling software. According to 36% or more of the teachers, their students use graphics organizers at least once a week.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Gadsden County had different paths to professional certification. Eight teachers came from approved college degree programs, 4 teachers earned college course certification, and 2 earned district alternative certification. Teachers reported an average of 9.29 (SD=7.56) years in the education profession, and an average of 2.5 (SD=3.59) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Professional Education (1), Biology 6-12 (1), Elementary Education K-6 (2), English 6-12 (3), ESOL (1), Exceptional Student Ed. K-12 (1), Middle Grade Science 5-9 (1), Middle Grade Mathematics 5-9 (2), Middle Grade Social Science 5-9 (3), Physical Education K-12 (1), and Social Sciences 6-12 (2).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	21%	21%	7%	29%	21%
Professional Development	0%	0%	36%	64%	0%
Independent learning	7%	7%	50%	21%	14%
Interaction with other faculty/staff	0%	36%	14%	36%	14%
Distance Learning courses	50%	29%	7%	7%	7%
Teaching and Learning Summer Institute	0%	21%	29%	43%	7%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive with a 50% or more of responses reported as agree or strongly agree.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	14%	0%	0%	71%	14%
encourage me collaborate with my colleagues on technology integration.	14%	7%	14%	50%	14%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	14%	7%	0%	57%	21%
help me think about how technology may change my teaching practices.	14%	0%	0%	57%	29%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	14%	7%		57%	21%
encourage me to consider how technology can be used to facilitate student learning of content.	14%	0%	7%	50%	29%
focus on both the technical and instructional skills required to integrate technology.	14%	0%	7%	64%	14%
are traditionally in the form of after school workshops.	21%	14%	14%	36%	14%
are consistent and continual.	21%	7%	14%	50%	7%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Gadsden County report using computers to support direct instruction, cooperative /collaborative learning, inquiry/research, discussion and communication, instructional delivery, instructional delivery, and as a learning/resource tool several times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	14%	0%	0%	36%	50%
For team teaching	7%	0%	36%	21%	36%	0%
For cooperative /collaborative learning	0%	7%	0%	7%	43%	43%
In centers	7%	0%	43%	14%	21%	14%
For project-based learning	0%	0%	14%	43%	36%	7%
For sustained writing	7%	7%	29%	7%	21%	29%
For sustained reading	7%	7%	43%	7%	21%	14%
For independent inquiry/research	0%	0%	14%	29%	29%	29%
For student discussion/ communication	0%	0%	36%	14%	7%	43%
For instructional delivery	0%	14%	0%	0%	36%	50%
As a learning tool/resource	0%	0%	14%	0%	21%	64%
For student assessment	0%	0%	36%	21%	14%	29%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. Seventy-nine percent of teachers responded that their schools did not have on-site computer support specialists. In the schools involved with the *Leveraging Laptops* Program that did have on-site specialists in Gadsden County, teachers reported 1-2 technical support staff members were available. Twenty-one percent of the teachers reported the staff was full-time, and none of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff is shown in Table 4. (Note: 64% of the teachers did not respond because a support specialist was not available at their school).

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	0%	7%	7%	14%	7%
The on-site computer specialist is dedicated to helping teachers.	7%	0%	7%	14%	7%
I have adequate access to our on-site computer specialist.	7%	7%	14%	7%	0%
I have to contact our specialist several times before I get assistance.	0%	14%	7%	7%	7%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	0%	7%	14%	14%	0%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry (AR) project summaries

Context	– 8th grade life science
AR Question	– After a presentation of the science lesson utilizing technology, will a content related assessment, designed by the textbook publisher and issued to 8th grades students through their laptops, improve their test scores compared to students who are assessed on paper?
Data Collection Methods	– Test Scores
Results	– The group of computer test takers had the higher average test score (76), compared to the paper test takers which averaged (70).
Other Outcomes	– Students have more confidence going in to test time when be assessed on the computer. I also realized the students were able to read faster from the computer screen and finish their test much quicker than those students on paper. These results say that with technology, the students will increase their level of performance.

Context	– 8th grade life science with project based learning
AR Question	– Will a project-based learning activity, designed to engage 8th grade science students in research as well as enhance their understanding of the importance of food chains/ webs in Earth's biomes, support learning for students of various learning styles when paired with a peer?
Data Collection Methods	– Student artifacts
Results	– Students perform better and more comfortably when paired with a peer. For example, Rachel never asks questions or participate in class discussions. However, with the assistance of a peer she was able to complete her biome project via Powerpoint and explain to me some main points in the lesson. – The peer who assisted benefited from the experience as much as the student whom they assisted.
Other Outcomes	– I will continue allow students who find assignments challenging to receive assistance from a peer. – This was a worthwhile project.

Context	– 8th grade genetics with internet resources
AR Question	– Which sub-group will produce a quality multimedia presentation to present their findings of a DNA laboratory observation: Sub-Group 1--students using laptops computers to explore referenced science websites in our current text books or Sub-Groups 2: students who will use only handouts and textbooks?
Data Collection Methods	– Student artifacts – Reflective Journals
Results	– Analysis of student work suggests students working with their laptops received a better understanding of what DNA was and its structure – Students using laptops were more motivated and engaged in the work.
Other Outcomes	– Laptops provided opportunity for the students to enjoy the project they were working on, gain more knowledge in the particular subject area, and gain a better understanding of how to work the laptops and programs they used – Our team will incorporate the use of laptops in much more of the curriculum and stress to the other two teams how helpful integrating computers into the lessons really is.

Context	– 8th grade FL history with internet and publishing
AR Question	– How has the new available technology resources improved my students participation in learning Florida history?
Data Collection Methods	– Test scores – Student Artifacts

Results	– There was a relationship between increase in the student's grade scores and the participation of the Florida history project.
	– Those who used their laptops to complete their Florida History project were more enthused about completing the project.
	– Students using laptops were able to find more information using more resources. They were more creative with brochures than those student who completed boards.
Other Outcomes	– Students displayed greater interest in Florida history when using their laptop as a resource.
	– Our eighth grade team have met to discuss incorporating laptops into many assignments for students to gain and retain more information.

Context	– 8th grade writing with Inspiration
AR Question	– Will Inspiration software help my 8th Grade Language Arts students better plan their essays during the pre-writing process and will the more detail plan in turn, improve their final drafts?
Data Collection Methods	– Test scores
	– Student Artifacts
	– Rubrics
	– Reflective Journals
Results	– This strategy improved the writing of my 8th Grade Language Arts students
	– The greatest change noted was that the focus of the papers were very consistent. Students were able to remain on topic without adding extraneous information that did not relate to the topic.
	– Students that struggled with staying on focus used Inspiration as a planning device and had significant improvements.
	– Average and high achieving students used Inspiration to enhance their thoughts and had minor improvements.
Other Outcomes	– Inspiration was a tool that fascinated students with its many capabilities. Therefore they took interest and used it to organize their thoughts on the writing prompt.

Hendry

Thirteen teachers from two different high schools in Hendry County participated in the *Leveraging Laptops* Program, and 11(response rate of 85%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.

Setting

Teachers involved with the *Leveraging Laptops* Program from Hendry County reported an average of 25 (SD=5.06) students per class. The teachers reported an average of 26.27 (SD=8.04) laptops and average of 6.64 (SD=10.5) desktops in their classrooms.

Teachers involved in the program taught many different grade levels. Six teachers reported currently teaching 9th grade, 10 reported teaching 10th grade, 2 reported teaching 11th grade, 7 reported teaching 12th grade, and 4 reported teaching adult education. Two teachers reported currently teaching mathematics, and 3 reported other.

Technology Used

Teachers in Hendry County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, presentation, and Internet browsing one or more times a week. Authoring, database, spreadsheet and concept mapping software packages were used much less frequently by teachers. Fifty percent or more teachers reported their students use word processing, draw/paint/graphic, presentation, and Internet browsing software at least once a month. Fifty percent or more teachers reported their students did not use spreadsheet, database, authoring, and concept mapping software at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, problem-solving, and CD reference software at least once a month or more. More than 50% of teachers reported not using blogging, wiki, process tools, testing, ebooks, and podcasting software at all. Fifty percent or more teachers reported their students did not use planning, blogging, wiki, process tools, testing, ebook, or podcasting software at all. Forty percent or more teachers reported their students use CD reference, drill/practice/tutorial, and problem-solving at least once a month.

When looking at digital production software, both student and teacher use is much less frequent. Eighty percent of teachers or more report never using podcasting and digital story telling software packages. Fifty percent or more teachers report using digital audio, video and graphics organizer software once a month or more. Seventy percent or more teachers report their students never use digital audio, video, podcasting or digital story telling software. According to 50% or more of the teachers, students use graphics organizers at least once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Hendry County had different paths to professional certification. Four teachers came from approved college degree programs, 1 teacher earned college course certification, 3 earned district alternative certification, and 3 transferred from other states. Two of the teachers were actively teaching in mathematics, and 3 of the teachers reported teaching other areas.

The experience levels of the teachers involved in the *Leveraging Laptops* program were diverse. Teachers reported an average of 20.73 (SD=11.08) years in the education profession, and an average of 5.09 (SD=4.23) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Professional Education (1), Biology 6-12 (7), Chemistry 6-12 (3), Computer Science K-12 (2), Earth/Space Science 6-12 (4), Health K-12 (2), Mathematics 6-12 (3), Middle Grade Sciences 5-9 (1), Middle Grade Social Sciences 5-9 (1), Physical Education K-12 (3), and Physics 6-12 (3).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	18%	9%	27%	36%	9%
Professional Development	0%	0%	46%	36%	18%
Independent learning	18%	27%	18%	9%	18%
Interaction with other faculty/staff	18%	46%	9%	9%	9%
Distance Learning courses	73%	0%	9%	0%	9%
Teaching and Learning Summer Institute	0%	18%	64%	0%	9%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Ninety percent or more of the teachers responded as strongly agreeing or agreeing to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	0%	9%	55%
encourage me collaborate with my colleagues on technology integration.	0%	9%	0%	9%	55%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	0%	0%	18%	46%
help me think about how technology may change my teaching practices.	0%	0%	0%	9%	55%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	0%	0%	9%	73%
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	0%	0%	82%
focus on both the technical and instructional skills required to integrate technology.	0%	0%	0%	18%	64%
are traditionally in the form of after school workshops.	0%	0%	9%	46%	18%
are consistent and continual.	9%	0%	0%	27%	46%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Hendry County report using computers to support direction instruction, project-based learning, inquiry/research, and instructional delivery one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	27%	9%	9%	27%	27%
For team teaching	27%	64%	9%	0%	0%	0%
For cooperative /collaborative learning	0%	46%	9%	18%	18%	0%
In centers	27%	55%	9%	0%	0%	0%
For project-based learning	0%	18%	18%	36%	27%	0%
For sustained writing	0%	46%	9%	27%	9%	0%
For sustained reading	0%	36%	36%	18%	0%	0%
For independent inquiry/research	0%	9%	36%	36%	18%	0%
For student discussion/ communication	0%	64%	9%	18%	0%	0%

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For instructional delivery	9%	9%	9%	9%	27%	27%
As a learning tool/resource	0%	0%	36%	27%	18%	18%
For student assessment	0%	46%	18%	9%	18%	0%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All teachers responded that their schools had on-site computer support specialists. In the schools involved with the *Leveraging Laptops* Program in Hendry County, 2-3 technical support staff members were available. Eighty-two percent of the teachers reported the staff was full-time, and 63% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	0%	0%	0%	55%	46%
The on-site computer specialist is dedicated to helping teachers.	0%	0%	0%	55%	46%
I have adequate access to our on-site computer specialist.	0%	0%	0%	55%	46%
I have to contact our specialist several times before I get assistance.	46%	36%	0%	9%	9%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	0%	18%	9%	46%	27%

Student Achievement

The teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry project summaries

Context	– 10th grade biology: Cellular respiration simulation
AR Question	– Will a project based learning activity for 10th grade Biology students and interactive website simulations improve student understanding of cellular respiration when compared to the traditional reading and writing approach?
Data Collection Methods	– Test scores

Results	– Project-based learning activities increased student learning (PBL students average score was 82.4% while students taught in a traditional manner averaged 72.6%)
	– When the same test was administered to the second group of students after using the project-based approach, scores improved to an average of 82.4%.
Other Outcomes	– Students were able to individualize their instruction by selecting resources of interest to them and better fit their style of learning.
	– Extensive student interactions were evident during the development of the student poster projects.
	– Learning was student driven and not teacher driven.
	– Results were shared with colleagues at school and at NECC

Context	– 11-12th grade physics, probes, spreadsheets
AR Question	– Will a project based learning activity for a 11-12th grade Physics class using GLX technology combined with a laptop computer and Microsoft Excel improve student learning of the concepts associated with freefall motion and the graphical representations of the motion: Position, velocity, and acceleration vs. time?
Data Collection Methods	– Test scores
	– Student Artifacts
Results	– Students were observing, sharing and analyzing the results as the lab proceeded
	– The work done in this investigation was much more beneficial than the methods that had been used in the past.
	– Student interaction and knowledge retention was greater than in previous years
	– Project has improved the students learning progress.
Other Outcomes	– Project-Based Learning activities through technology increase student learning in a quicker timeline than tradition activities without technology
	– Materials placed on school website
	– Other teachers and parents have been involved
	– Made a presentation at NECC

Context	– Marine science, water quality with Internet research
AR Question	– How well can laptop technology use engage Marine Science students to learn and understand about local water quality conditions and how this natural resource is influenced, managed and regulated by local, regional and federal government agencies?
Data Collection Methods	– Focus group notes
	– Student artifacts
	– Informal interviews
Results	– Student comprehension and critical thinking skills were apparent by the educated questioning of our guest speaker.
	– Internet search engines proved to be an engaging fact finding mission
	– Knowledge on these subjects was learned exclusively by student research as guided by the questions researched on the net.
Other Outcomes	– The guest speaker commented after her presentation, "I am impressed by your student's knowledge of me, CERP and ACCELER8".

Hillsborough
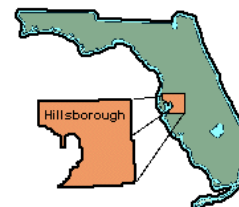
Twenty-six teachers from six different schools in Hillsborough County participated in the *Leveraging Laptops* Program, and 20 (response rate of 77%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools.

Setting

Teachers involved with the *Leveraging Laptops* Program from Hillsborough County reported an average of 24.16 (SD=14.53) students per class. The teachers reported an average of 9.94 (SD=11.65) laptops and average of 8 (SD=11.4) desktops in their classrooms.

Four teachers reported teaching media/technology, 6 in English, 2 in special education, 7 in mathematics, 7 in reading, 7 in science, 6 in social studies, 1 and 3 reported other. Three teachers reported teaching Pre-Kindergarten-K, 5 taught Kindergarten, 6 taught 1st grade, 6 taught 2nd grade, 10 taught 3rd grade, 9 taught 4th grade, 5 taught 5th grade, 1 taught 6th grade, 1 taught 7th grade, 4 taught 8th grade, 3 taught 9th grade, 3 taught 10th grade, 3 taught 11th grade, 3 taught 12th grade, and 1 taught adult education.

Technology Used

Teachers in Hillsborough County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, presentation, and Internet browsing software one or more times a week. Authoring, database, spreadsheet, and concept mapping software packages were used less frequently by teachers (30% of teachers or more reported not at all, except spreadsheets at 10%). Fifty percent or more teachers reported their students use word processing, draw/paint/graphic, and Internet browsing software at least once a week or more. Thirty percent or more teachers report their students do not use concept mapping, database, or spreadsheet software packages at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, blogging, and wiki software packages at least once a week. More than 30% of teachers reported not using process tools, CD reference, drill/practice/tutorial, problem-solving, testing, ebook, and podcasting software at all. Fifty percent of teachers or more reported that their students use drill/practice/tutorial software one or more times a week. Forty percent or more teachers report their students do not use planning, CD reference, blogging, wiki, ebook, podcasting, or process tool software packages at all.

When looking at digital production software, both student and teacher use is much less frequent. Fifty percent of teachers or more report using digital audio, and digital video software packages at least once a month. Forty-five percent of teachers report not using graphics organizers, podcasting, or digital story-telling software at all. Fifty percent or more teachers report their students never use digital audio, video, podcasting, graphics organizers, or digital story telling software packages at all. Graphics organizers were use more frequently, but most teachers report less than once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Hillsborough County had different paths to professional certification. Six teachers came from approved college degree programs, 7 teacher earned college course certification, 4 earned distinct alternative certification, and 2 transferred from other states. Teachers reported an average of 12.79 (SD=10.11) years in the education profession, and an average of 6.21 (SD=6.15) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Biology 6-12 (1), Computer Science K-12 (1), Ed. Media Specialist PK-12 (4), Elementary Education K-6 (9), English 6-12 (1), ESOL (3), Exceptional Student Ed. K-12 (3), General Knowledge (1), Mathematics 6-12 (1), Technology Education K-12 (2), Middle Grades General Sciences (1), Middle Grade Mathematics (1), Physics 6-12 (1), Pre-Kindergarten/Primary PK-3 (1), and Social Sciences 6-12 (1).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	20%	25%	40%	5%	5%
Professional Development	5%	30%	35%	20%	5%
Independent learning	0%	15%	40%	35%	5%
Interaction with other faculty/staff	5%	40%	30%	15%	5%
Distance Learning courses	40%	30%	20%	5%	0%
Teaching and Learning Summer Institute	25%	35%	10%	20%	0%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Fifty-five percent or more of the teachers responded as strongly agreeing or agreeing to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	5%	60%	25%
encourage me collaborate with my colleagues on technology integration.	0%	0%	15%	45%	35%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	5%	10%	45%	30%
help me think about how technology may change my teaching practices.	0%	0%	5%	55%	30%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	0%	5%	60%	30%
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	5%	60%	30%
focus on both the technical and instructional skills required to integrate technology.	0%	10%	10%	45%	30%
are traditionally in the form of after school workshops.	10%	10%	10%	45%	20%
are consistent and continual.	10%	20%	10%	35%	20%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Hillsborough County report using computers for direct instruction, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	20%	20%	15%	20%	20%
For team teaching	20%	40%	15%	15%	0%	5%
For cooperative /collaborative learning	5%	20%	35%	20%	5%	10%
In centers	0%	40%	10%	5%	10%	30%
For project-based learning	0%	15%	45%	15%	10%	5%
For sustained writing	0%	5%	50%	30%	5%	5%
For sustained reading	0%	20%	50%	10%	10%	5%
For independent inquiry/research	0%	15%	35%	25%	0%	15%
For student discussion/ communication	5%	45%	20%	5%	5%	10%
For instructional delivery	5%	10%	15%	25%	25%	15%
As a learning tool/resource	0%	5%	5%	25%	20%	40%
For student assessment	5%	25%	25%	15%	500%	20%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. Seventy-five percent of the teachers responded that their schools had on-site computer support specialists. In the

schools involved with the *Leveraging Laptops* Program in Hillsborough County, 0-2 technical support staff members were available with most teachers reported having 1 available. Fifty percent of the teachers reported the staff was full-time, and none of the teachers reported the computer support specialists were grant-funded, indicating the schools had permanent positions. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	5%	15%	20%	20%	25%
The on-site computer specialist is dedicated to helping teachers.	5%	20%	20%	15%	25%
I have adequate access to our on-site computer specialist.	10%	10%	15%	15%	30%
I have to contact our specialist several times before I get assistance.	20%	25%	10%	20%	5%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	15%	15%	5%	20%	25%

Lake

One hundred twenty-eight teachers from eight different schools in Lake County participated in the *Leveraging Laptops* Program, and 75 (response rate of 59%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.
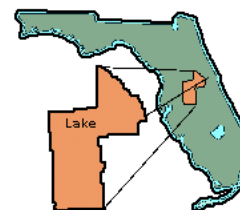
Setting

Teachers involved with the *Leveraging Laptops* Program from Lake County reported an average of 24.55 (SD=3.69) students per class. The teachers reported an average of 15.57 (SD=11.54) laptops and average of 4.61 (SD=6.0) desktops in their classrooms.

Four teachers reported teaching media/technology, 34 in English, 1 in special education, 18 in mathematics, 13 in reading, 22 in science, 20 in social studies, 1 in vocational education and 4 reported other. Seventeen teachers reported teaching 6th grade, 20 taught 7th grade, 21 taught 8th grade, 24 taught 9th grade, 29 taught 10th grade, 29 taught 11th grade, 28 taught 12th grade, and 2 taught adult education.

Technology Used

Teachers in Lake County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using word processing, spreadsheets, presentation, and Internet browsing software one or more times a week. Authoring, database, draw/paint/graphics, and concept mapping software packages were used less frequently by teachers (30% of teachers or more reported not at all). Forty percent or more teachers reported their students use word processing, and Internet browsing software at least once a week or more. Forty percent or more teachers report their students do not use spreadsheets, concept mapping, database, authoring or concept mapping software packages at all. Teachers reported student use of presentation and draw/paint/graphics was moderate (40% report 1 or more times a month).

Teachers and students also used other software packages. Forty-five percent or more teachers reported using planning, and problem-solving software packages at least once a week. More than 30% of teachers reported not using blogging, wiki, process tools, drill/practice/tutorial, testing, ebook, and podcasting software at all. Thirty percent of teachers or more reported that their students use drill/practice/tutorial, problem-solving, and testing software one or more times a week. Fifty percent or more teachers report their students do not use planning, CD reference, blogging, wiki, ebook, podcasting, or process tool software packages at all.

When looking at digital production software, both student and teacher use is much less frequent. Forty percent of teachers or more report using digital audio, and graphics organizer software packages at least once a month. Fifty percent of teachers report not using digital video, podcasting, or digital story-telling software at all. Fifty percent or more teachers report their students never use digital audio, video, podcasting,

or digital story telling software packages at all. Graphics organizers were use more frequently, but most teachers report less than once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Lake County had different paths to professional certification. Twenty-one teachers came from approved college degree programs, 29 teacher earned college course certification, 17 earned distinct alternative certification, 27 transferred from other states, and one did not provide a response. Teachers reported an average of 11.05 (SD=10.7) years in the education profession, and an average of 3.86 (SD=4.0) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Biology 6-12 (11), Business Education 6-12 (9), Drama 6-12 (1), Earth/Space Science 6-12 (2), Ed. Media Specialist PK-12 (1), Elementary Education K-6 (11), English 6-12 (26), ESOL (10), Exceptional Student Ed. K-12 (5), Family and Consumer Science (1), Health K-12 (1), Journalism 6-12 (1), General Knowledge (1), Mathematics 6-12 (10), Middle Grades English 5-9(4), Middle Grades General Sciences (11), Middle Grades Integrated Curriculum (7), Middle Grade Mathematics (8), Middle Grades Social Science 5-9 (4), Physical Education K-12 (4), Physics 6-12 (1), Pre-Kindergarten/Primary PK-3 (1), Reading K-12(3), Social Sciences 6-12 (12), and Speech 6-12 (2).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	23%	25%	19%	2,420%	6%
Professional Development	6%	34%	35%	23%	2%
Independent learning	6%	18%	21%	50%	5%
Interaction with other faculty/staff	2%	23%	35%	35%	5%
Distance Learning courses	62%	19%	7%	10%	2%
Teaching and Learning Summer Institute	44%	25%	21%	8%	1%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Fifty-five percent or more of the teachers responded as strongly agreeing or agreeing to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	2%	4%	12%	60%	21%
encourage me collaborate with my colleagues on technology integration.	2%	7%	17%	57%	16%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	3%	7%	26%	50%	13%
help me think about how technology may change my teaching practices.	2%	4%	8%	57%	25%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	3%	10%	18%	51%	18%
encourage me to consider how technology can be used to facilitate student learning of content.	2%	3%	13%	61%	20%
focus on both the technical and instructional skills required to integrate technology.	2%	7%	21%	54%	15%
are traditionally in the form of after school workshops.	8%	15%	24%	40%	12%
are consistent and continual.	2%	18%	30%	39%	11%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Lake County report using computers for direct instruction, independent inquiry/research, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	15%	17%	10%	38%	20%
For team teaching	22%	45%	15%	5%	2%	6%
For cooperative /collaborative learning	3%	19%	33%	22%	16%	6%
In centers	15%	41%	18%	12%	11%	2%
For project-based learning	1%	7%	48%	27%	15%	1%
For sustained writing	10%	42%	26%	8%	10%	2%
For sustained reading	8%	47%	22%	14%	4%	3%
For independent inquiry/research	0%	5%	43%	32%	15%	5%
For student discussion/ communication	2%	41%	25%	17%	6%	6%
For instructional delivery	0%	7%	17%	13%	36%	27%
As a learning tool/resource	0%	4%	24%	26%	28%	17%
For student assessment	0%	33%	22%	20%	14%	12%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All the teachers responded that their schools had on-site computer support specialists with exception of 1 teacher that was unsure. In the schools involved with the *Leveraging Laptops* Program in Lake County, 0-5 technical support staff members were available with most teachers reporting having 1-2 support staff available. Sixty-one percent of the teachers reported the staff was full-time, and about 10% of the teachers reported the computer support specialists were grant-funded, indicating that most schools had permanent positions. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	2%	5%	6%	41%	45%
The on-site computer specialist is dedicated to helping teachers.	2%	1%	6%	33%	58%
I have adequate access to our on-site computer specialist.	4%	6%	7%	47%	35%
I have to contact our specialist several times before I get assistance.	24%	44%	16%	8%	7%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	2%	2%	15%	40%	41%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry (AR) project summaries

Context	– 9th grade math project based learning with technology
AR Question	– Will a project-based learning activity designed to facilitate 9th grade students' understanding of "real life math" support learning at the higher levels of Bloom's taxonomy?
Data Collection Methods	– Informal interviews – Reflective journals

Results	– Students were forced to reconcile their conceptions of finances and schooling and the realities of how much it costs to live and how many years of schooling is required for certain professions.
	– Higher level thinking skills were truly evident when they realized (on their own) that they had to go back and re-prioritize their budget and lifestyle choices
	– Not only did this challenge their higher level thinking skills, but it also provides opportunities for rigor and relevance, and may have a motivating factor on their work ethic for the rest of their high school career.
Other Outcomes	– This was a motivational tool for students. Having access to such immediate research via the laptops allowed me to interject class discussion at all the right times, making the learning more meaningful to the students.
	– We are looking into spending more money on additional technology next year.

Context	– 6th grade reading and speaking with internet research and word processing
AR Question	– Will the opportunity to research and word process their speeches help my 6th grade Intensive Reading students with their public speaking skills?
Data Collection Methods	– Student artifacts
	– Rubric from the 4-H Tropicana Public Speaking Program
Results	– Students consistently received high marks in Choice of Material and Effective introduction, Effective body, and Effective conclusion. I attribute this success to their Internet access and time to adequately research and narrow their topics to a two or three-minute speech.
	– Their word processing time also gave them the chance to essentially write an essay and convert it into a succinct and interesting speech. The confidence of having written, typed, and then practiced their speeches also gave them high marks across the board in Audience bond, Delivery, Pronunciation, Articulation, Volume, and Speed.
Other Outcomes	– The use of laptop computers gave my students a real advantage in successfully researching, writing, and completing this speech project.
	– A definite pattern of success showed through in these speech scores.

Context	– 10th grade biology with project based learning, internet research and digital simulations
AR Question	– Will a project-based activity and simulation designed to facilitate students' understanding of biotechnology support learning in the various quadrants of the rigor/relevance framework?
Data Collection Methods	– Test scores
	– Informal interviews
	– Rubrics

Results	– Project increased the level of relevance for my students (i.e. Students involved in FFA found that biotechnology is being used to alter the nutritional value of rice so that it contains more vitamins. Students in the health academy found that biotechnology is being used to find cures for cancer by altering the way a cell is able to replicate.) – The project also increased the level of rigor in the classroom which is evident by the improvement in test scores. When all classes were combined the average test score increased from 65 on the pre-test to 71 on the post-test for an overall improvement of 6%.
Other Outcomes	– Project-based learning activities raise the level of rigor and relevance in the classroom. – I conducted an inservice for the teachers in our science department to present my findings and show how beneficial project-based learning is in Science.

Context	– 10th grade English with project based learning, range of production and media technology
AR Question	– Will the use of a technology-based project enhance low achieving students' comprehension of the concept of courtly love, an integral concept to the study of our unit on various King Arthur texts?
Data Collection Methods	– Test scores – Student artifacts – Rubrics
Results	– The use of technology based project as a means of helping students better understand the rules of courtly love was a successful practice – The entire King Arthur unit was enhanced due to the high level of engagement
Other Outcomes	– Many other teaching moments arose that I did not expect such as a discussion about what is appropriate and for which audience. – Targeting higher level thinking skills rather than using as a "baby-sitter" it can foster a deeper level of comprehension due to the interactive nature of it. – The kids were able to interact with one another thus fostering a sense of wholeness. – Kids and made connections between the King Arthur they were reading and King Arthur in modern pop-culture. – I applied for an inclusion grant wherein I requested a classroom set of laptops that will stay permanently in my room and was approved for it.

Context	– 8th grade math with project based learning and CPS
AR Question	– How does the infusion of a project-based laptop activity and classroom performance system allow 8th grade Algebra I students to develop a concrete understanding of the factoring polynomials process, measured with ongoing formative assessment?
Data Collection Methods	– Test scores – Focus group notes – Field notes

Results	– The students have demonstrated successful mastery of the factoring process. This was measured in multiple ways:
	- First, the use of the CPS clickers demonstrated each period that students were progressing towards mastery.
	- The second measure of success was the graphic organizers the students created in Publisher.
	- The last measure of success was the end of chapter assessment, when compared to last years students were on average, five points higher.
Other Outcomes	– The project-based activity with factoring positively impacted the find product-the chapter assessment. Although the assessment is aligned with the high stakes the students will be responsible for passing at year's end, the project helped further their learning and give an abstract concept a concrete meaning. Through the project, the students developed a deeper understanding of the factoring process and it will help them to retain the process for longer periods of time.
	– This research has just supported my desire to obtain more technology for my classroom.
	– It has made it clear the students learn well with he tools that they use in everyday life. Relevance is crucial for teaching a successful lesson, and the laptops truly exemplify that notion.
	– I observed throughout the context of the lesson that students were motivated, engaged and actively participating to create the final product.
	– I am sure that factoring will be one of the foremost topics that the students will perform well on with their end of year county exam.

Context	– Middle school writing with laptops
AR Question	– Will the use of laptop computers affect the quality and amount of writing produced by my middle school Language Arts students in grades 6-8?
Data Collection Methods	– Literature
	– Student artifacts
	– Informal interviews
	– Rubrics
Results	– My students are much more fluent writers as a result of having the laptops.
	– Electronic editing and review and feedback helped.
Other Outcomes	– I plan on using the writer's workshop next year using the laptops. I also will continue to have the students access sites on the Internet to help them with grammar and commonly confused words. In addition, we will do Webquests, now that I am more aware of what is available.

Context	– 7th grade science
AR Question	– Will integrating technology into the science curriculum for seventh grade students of all ability levels enhance their learning of science concepts?
Data Collection Methods	– Test scores
	– Student artifacts
	– Rubrics

Results	– Students were more engaged in the science concept and are motivated to complete the assignment.
	– Different types of students performed in different ways. The students in the gifted classes excelled in the assignments. The students that were in regular classes, but were high performers excelled as well. However, the students that were in remedial classes because of poor performance on the FCAT appeared more frustrated and not engaged in completing the assignments. They needed more instructional time on how to use the basic maneuvers on the computers.
Other Outcomes	– There is great need to start computer literacy courses for our younger students.
	– Laptops allow student to extend and reinforce concepts in project-based learning environment that promotes all learning styles and challenges the higher thinking skills.

Madison

Eleven teachers from five different schools in Madison County participated in the *Leveraging Laptops* Program, and 10 (response rate of 91%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.
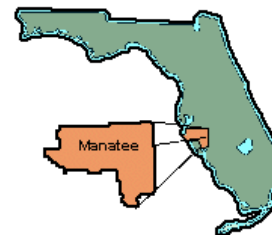
Setting

Teachers involved with the *Leveraging Laptops* Program from Madison County reported an average of 21.4 (SD= 2.41) students per class. The teachers reported an average of 25.3 (SD=4.7) laptops and average of 9.5 (SD=10.98) desktops in their classrooms.

The teachers taught in the areas of Media/Technology (1), English (3), Math (4), Reading (6), Science (7), Social Studies (6), and Vocational Education (1). Teachers reported the grades currently being taught: 4 teach 3rd grade, 2 teacher 4th grade, 3 teach 5th grade, 1 teaches seventh grade, 1 teaches 8th grade, 2 teach 9th grade, 2 teach 10th grade, 3 teach 11th grade, 2 teach 12th grade, and 1 teaches adult education.

Technology Used

Teachers in Madison County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using Word processing, spreadsheets, draw/paint/graphic , presentation, authoring concept mapping, and Internet browsing one or more times a week. Databases were used less frequently by teachers. Fifty percent or more teachers reported their students used Word processing, draw/paint/graphic, presentation software, concept mapping, and Internet browsing at least once a week or more. Forty-percent of teachers or more report their students did not use spreadsheet, database, and authoring at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, CD reference software, blogging and wiki, Drill/practice/tutorial, problem-solving, and testing software at least once a week or more. More than 50% of teachers reported not using process tools, ebooks, and podcasting software at all. Teachers reported that more than 50% of their students did not use CD reference, blogging, wiki, process tools, testing, ebook, or podcasting software at all. Fifty percent or more teachers reported their students use drill/practice/tutorial, testing, and problem-solving software once a week or more.

When looking at digital production software, both students and teachers use is much less frequent. Fifty percent or more teachers report never using podcasting, digital audio, and digital story telling software packages. Fifty percent or more teachers report using video and graphics organizer software once a month or more. Sixty percent of teachers or more report their students never use digital audio, video, podcasting or digital story telling software. According to 80% of the teachers, graphics organizer software is used once a week or more by their students.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Madison County had different paths to professional certification. Three teachers came from approved college degree programs, 4 teachers earned college course certification, 2 earned district alternative certification, and 1 transferred from another state. Two of the teachers were actively teaching in mathematics, and 3 of the teachers reported teaching other areas.

Teachers reported an average of 13.55 (SD=9.35) years in the education profession, and an average of 7.4 (SD=6.36) years of using computers in their classrooms for the delivery of instruction. Teachers involved were certified to teach in many areas including Ed. Media Specialist PK-12 (1), Biology 6-12 (2), Elementary Education K-6 (7), ESOL (4), Exceptional Student Ed. K-12 (1), Reading K-12 (2), and Social Science 6-12 (1).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	40%	30%	0%	30%	0%
Professional Development	0%	50%	20%	30%	0%
Independent learning	0%	0%	40%	40%	20%
Interaction with other faculty/staff	0%	40%	30%	30%	0%
Distance Learning courses	0%	20%	10%	20%	10%
Teaching and Learning Summer Institute	0%	20%	40%	10%	10%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Ninety percent or more of the teachers either strongly agreed or agreed to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	20%	40%	40%
encourage me collaborate with my colleagues on technology integration.	0%	0%	20%	50%	30%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	0%	30%	40%	30%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
help me think about how technology may change my teaching practices.	0%	0%	20%	40%	40%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	10%	30%	20%	40%
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	20%	40%	40%
focus on both the technical and instructional skills required to integrate technology.	0%	10%	20%	40%	30%
are traditionally in the form of after school workshops.	20%	10%	40%	20%	10%
are consistent and continual.	10%	10%	30%	30%	20%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Madison County report using computers to for direction instruction, cooperative /collaborative learning, sustained writing, independent inquiry/research, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	10%	10%	10%	40%	30%
For team teaching	20%	40%	20%	10%	10%	0%
For cooperative /collaborative learning	0%	0%	0%	10%	70%	20%
In centers	10%	40%	0%	0%	30%	20%
For project-based learning	0%	0%	0%	10%	70%	20%
For sustained writing	0%	20%	10%	20%	40%	10%
For sustained reading	0%	10%	10%	40%	40%	0%
For independent inquiry/research	0%	0%	0%	10%	80%	10%
For student discussion/ communication	10%	40%	20%	10%	20%	0%
For instructional delivery	0%		10%	30%	30%	30%
As a learning tool/resource	0%	0%	0%	0%	40%	60%
For student assessment	0%	10%	40%	30%	10%	10%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. Seventy percent of the teachers responded that their schools had on-site computer support specialists, and the remaining indicated the school did not. In the schools involved with the *Leveraging Laptops* Program in Madison County, 0-3 technical support staff members were available, with most teachers reporting having at least one on staff. Sixty percent of the teachers reported the support staff was full-time, and 10% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	0%	0%	10%	30%	30%
The on-site computer specialist is dedicated to helping teachers.	0%	0%	10%	20%	40%
I have adequate access to our on-site computer specialist.	0%	10%		40%	20%
I have to contact our specialist several times before I get assistance.	10%	20%	40%	0%	0%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	10%	0%	20%	20%	20%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry (AR) project summaries

Context	– Grades 3-5 project based learning with media and production tools
AR Question	– How can technology help my students learn the skill that are needed to do well on the FCAT?
Data Collection Methods	– Test scores – Journals – Student artifacts – Rubric
Results	– The Independent Investigation Method helped students become more responsible and enables teachers to better meet their needs. – When students have learn how to research a topic and can choose their product to demonstrate what they have learned, they acquire more knowledge and skills
Other Outcomes	– I am working on thematic units of study. – EETT is funding me to attend a conference on advanced technology

Context	– 10-11 grade physical science with concept maps
AR Question	– Will the use of Inspiration and IMM impact students' responses to "prompt questions" regarding the socio-scientific issues associated with energy?
Data Collection Methods	– Focus group notes – Anecdotal records – Rubrics – Reflective journals
Results	– Students displayed a better familiarity with the IIM method as we continued to use it in our research practices daily. – Student knowledge increased regarding the topic of ENERGY as demonstrated by their questioning and "comfort" with the topic. – There was increased student awareness of the topic of ENERGY and how it impacted their everyday lives.
Other Outcomes	– Students are motivated when they are asked to seek possible solutions to everyday problems.

Context	– 3rd grade social studies with project based learning
AR Question	– This project-based learning activity was designed to facilitate 3rd grade students' understanding of the climate, economy, culture, and geography layout of five different states.
Data Collection Methods	– Focus group notes – Anecdotal records – Rubrics – Reflective journals
Results	– Laptops provide opportunities for project-based learning activities that help foster higher level thinking skills. – My data confirmed that when students initiate learning, they retain the information longer.
Other Outcomes	– Wow - The students and I learned alot! Not only did we learn about the five different states, we learned to use new technology. The students were amazing! They learned how to use and master numerous programs on their laptops. What a wonderful experience for my class and myself. – Teaching and learning PowerPoint and Inspiration are tools that the students have had the most fun with. I believe that when learning is fun and exciting the students retain the information longer. I will continue to expose the students to more and more computer programs.

Context	– 6th grade reading with project based learning
AR Question	– Will a project-based research project, designed to facilitate 6th grade reading students' understanding of the ecosystems that exist in a given area, encourage students to use higher level thinking skills?
Data Collection Methods	– Reflective journals – KWL charts – Student artifacts

Results	– Students' knowledge of the subject area increased as demonstrated by KWL charts and newsletters produced.
Other Outcomes	– The laptops were an invaluable tool for students as they researched. The easy access to the Internet, online encyclopedias, united streaming, and other programs helped to make the research process easier. Programs such as PowerPoint, Inspiration, Microsoft Publisher, and Windows Movie Maker allowed the student to create interesting projects. – The use of laptops in my classroom will continue to facilitate student learning. – I will be working with another teacher next year, on the use of project-based learning.

Context	– 5th grade projects with media and production tools
AR Question	– Will using individual laptop computers increase on task behavior and motivate a 5th grade class, that consist of students with a wide range of abilities, to cooperatively plan, research, and produce final products that demonstrate diverse thinking and a strong understanding of Early Explorers?
Data Collection Methods	– Test scores – Student Artifacts – Literature – Reflective journals
Results	– The students thus were able to create and develop original presentations that exceeded my expectations. – Through this process, these 5th graders gained communication skills both in the classroom and with public speaking. – They used technology with remarkable ease and discovered new techniques that they were able to share with others in the classroom and with me that enlightened all of us and made learning more fun.
Other Outcomes	– This year has been a dream come true for me. – The results are magnificent-both the projects themselves, material learned, and standard performance tests such as DIBELS and SCANTRON in Reading and Science – I will use Brainchild.com and BrainPop.com more next year. – I will write local grants to purchase BrainPop.com. – My students will also make more videos to share with others in the learning computer with NextVista.

Context	– 11th grade chemistry with internet research
AR Question	– Will an Independent Investigative Method (IIM), project-based learning activity designed for 11th grade chemistry honor students aide the students in developing their research and technology skills using laptop computers and the Internet to discover a clean or green energy replacement to fossil fuels?
Data Collection Methods	– Test scores – Journals – Student artifacts – Reflective journals
Results	

Other Outcomes	– I will share my successes and failures with my peers and teach them to use the technology in their classes. I have also encouraged them to apply for more grants to get more technology in the classrooms.
	– I also plan to attend more conferences that help me teach students to think and be creative in order to foster higher-level thinking and reading skills.
	– Since I am a team leader for our school, we meet on a regular basis to share our ideas and talents with each other on what technology actually works best with our students to help them improve their lives by improving their skills.

Context	– 3rd grade social studies with PBL, concept mapping, internet resources
AR Question	– Will a project-based learning activity designed to facilitate 3rd grade students' understanding and help to identify and compare patriotic symbols of the US?
Data Collection Methods	– Focus group notes
	– Journals
	– Literature
	– Student artifacts
	– Anecdotal records
	– Rubrics
Results	– Laptops provide additional opportunities for project based learning activities and help foster higher level thinking skills.
	– Laptops are used in 3rd grade to enhance learning in whole groups and small groups.
	– When students initiate learning they retain the information longer.
Other Outcomes	– I will continue to partner with my 3rd grade colleagues to enhance future project-based learning projects.
	– My students and I were totally shocked at what we could do. The daily use of technology in the classroom has enriched my teaching and has proven to improve the test scores of my 3rd graders.

Manatee

Sixteen teachers from two different schools in Manatee County participated in the *Leveraging Laptops* Program, and all (response rate of 100%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology in classrooms.

Setting

Teachers involved with the *Leveraging Laptops* Program from Manatee County reported an average of 23.44 (SD=2.56) students per class. The teachers reported an average of 25.69 (SD=6.43) laptops and average of 9.38 (SD=12.4) desktops in their classrooms. Four teachers reported teaching English, 4 in mathematics, 4 in science, and 4 in social studies. All teachers involved in the program in Manatee County taught in 6th grade.

Technology Used

Teachers in Manatee County used productivity software packages more than other software classifications. Thirty-five percent or more teachers reported using Word processing, presentation, concept mapping, and Internet browsing software one or more times a week. Authoring, database, spreadsheet, and draw/paint/graphic software packages were used less frequently by teachers (once a month or not at all). Thirty percent or more teachers reported their students use Word processing, presentation, concept mapping, and Internet browsing software at least once a week or more. Twenty-five percent or more teachers report their students do not use database, authoring, or spreadsheet software packages at all, and draw/paint/graphic software is used at least once a month (or not at all).

Teachers and students also used other software packages. Thirty-five percent or more teachers reported using planning, drill/practice/tutorial, testing, and CD reference at least once a week. More than 40% of teachers reported not using process tools, ebook, testing, blogging, wiki, or podcasting software at all. Thirty-five percent of teachers or more reported that their students use drill/practice/tutorial, and testing software one or more times a week. Forty percent or more teachers report their students do not use planning, CD reference, blogging, wiki, ebook, podcasting, and process software packages at all.

When looking at digital production software, both student and teacher use is much less frequent. Twenty percent of teachers or more report using graphics organizer software packages at least once a week. Teacher use of digital video, audio, podcasting, and digital story telling software packages is much less frequent. Fifty percent or more teachers report their students never use digital video, audio, podcasting or digital story telling software packages. Graphics organizers software packages were use more frequently as most teachers report at least once a week.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Manatee County had different paths to professional certification. Four teachers came from approved college degree programs, 7 teachers earned

college course certification, 4 teachers earned district alternative certification, and 1 transferred from another state. Teachers reported an average of 14.03 (SD=10.76) years in the education profession, and an average of 3.75 (SD= 3.75) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Professional Education (1), Biology 6-12 (1), Media Specialist PK-12 (1), Elementary K-6 (10), English 6-12 (1), ESOL (4), Mathematics 6-12 (1), Middle Grades English (4), Middle Grades Mathematics (4), Middle Grades Social Science (2), Pre-Kindergarten-3 (1), and Social Sciences 6-12 (1).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	56%	19%	0%	19%	0%
Professional Development	0%	19%	25%	44%	13%
Independent learning	0%	25%	31%	38%	0%
Interaction with other faculty/staff	0%	13%	50%	38%	0%
Distance Learning courses	63%	6%	6%	6%	0%
Teaching and Learning Summer Institute	25%	31%	19%	19%	0%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Sixty percent or more of the teachers either strongly agreed or agreed to each of the positively stated categories with the exception that professional development opportunities are traditionally in the form of after school workshops.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	6%	0%	13%	44%	31%
encourage me collaborate with my colleagues on technology integration.	6%	0%	6%	63%	25%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	6%	0%	25%	63%	6%
help me think about how technology may change my teaching practices.	6%	0%	0%	69%	19%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	6%	6%	0%	69%	19%

Professional development opportunities...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to consider how technology can be used to facilitate student learning of content.	6%	0%	6%	63%	25%
focus on both the technical and instructional skills required to integrate technology.	0%	19%	6%	50%	19%
are traditionally in the form of after school workshops.	6%	38%	25%	31%	0%
are consistent and continual.	6%	0%	25%	56%	13%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Manatee County reported using computers for direct instruction, cooperative /collaborative learning, project-based learning, for sustained writing, independent inquiry/research, discussion and communication, instructional delivery, as a learning tool/resource, and student assessment one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	0%	19%	19%	50%	13%
For team teaching	13%	44%	19%	6%	13%	0%
For cooperative /collaborative learning	0%	6%	25%	19%	44%	6%
In centers	0%	44%	19%	6%	19%	0%
For project-based learning	0%	13%	19%	13%	50%	6%
For sustained writing	13%	19%	6%	19%	25%	19%
For sustained reading	6%	31%	25%	0%	25%	13%
For independent inquiry/research	0%	6%	13%	19%	63%	0%
For student discussion/ communication	0%	38%	6%	13%	44%	0%
For instructional delivery	0%	0%	19%	19%	44%	19%
As a learning tool/resource	0%	0%	13%	13%	44%	25%
For student assessment	0%	0%	19%	25%	50%	630%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All of the teachers responded that their schools had on-site computer support specialists. In the schools involved with

the *Leveraging Laptops* Program in Manatee County, 1-3 technical support staff members were available with most teachers reporting having 1 available. Sixty-three percent of the teachers reported the staff was full-time, and 25% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	0%	0%	6%	31%	63%
The on-site computer specialist is dedicated to helping teachers.	0%	0%	6%	25%	63%
I have adequate access to our on-site computer specialist.	0%	13%	6%	44%	31%
I have to contact our specialist several times before I get assistance.	0%	44%	6%	6%	44%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	0%	6%	6%	38%	50%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry (AR) project summaries

Context	– 6th grade social studies with e-portfolios
AR Question	– Has the use of laptop computers to construct e-portfolios this school year motivated 6th grade students to develop school related goals, create action plans to achieve those goals, and given the students a positive school experience?
Data Collection Methods	– Survey
Results	– 85.4% of the students stated that using the laptops this year resulted in a positive school experience this school year. – 73.6% of the students reported that having the laptop assigned to them was a motivation to create school related goals. – 65.4% of the students answered that having the laptop assigned to them was a motivation in creating an action plan for their school related goals. – Majority of students reported that the laptops had a positive effect on their school motivation, enjoyment and interest in an action plan.
Other Outcomes	– There is room for improvement when it comes to creating an action plan. – The laptop did not have as much influence as I would have hoped. I will need to examine this more before I start out next school year. – Will share with school and district.

Context	– 6th grade vocabulary with word games
AR Question	– Would using games such as "hangman" and "battleship"? be an effective way of teaching the definitions of high-level vocabulary words used in class work to those students not enrolled in advanced class?
Data Collection Methods	– Test scores
Results	– Student comprehension of vocabulary words increased. (Pre-median score = 36; post-median score = 76.5) – The students enjoyed playing the game while learning the definitions of the words. – Laptops provide a means to increase student vocabulary. – Using a game can be a fun and learning experience for the students.
Other Outcomes	– I will continue to use this method next year to teach students the words they need to know to understand elements of literature and other essential words used in language arts instruction.

Context	– 6th grade social studies with word processing
AR Question	– Will a project-based learning activity improved students civic competence as well a their communication skills?
Data Collection Methods	– Student artifacts
Results	– The students were able to produce a creative and useful product by using their word processing skills. – Students improved their literary skills.
Other Outcomes	– Students will continue to improve their communication skills as a result of using computer applications.

Pinellas
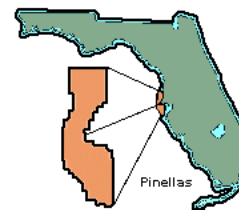
Sixty-two teachers from three different schools in Pinellas County participated in the *Leveraging Laptops* Program, and 56 (response rate of 90%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.

Setting

Teachers involved with the *Leveraging Laptops* Program from Pinellas County reported an average of 23.0 (SD=5.36) students per class. The teachers reported an average of 8.07 (SD=14.21) laptops and average of 5.0 (SD=5.58) desktops in their classrooms.

Two teachers reported teaching art/music, 2 in media/technology, 15 in English, 2 in special education, 25 in mathematics, 21 in reading, 37 in science, 20 in social science, and 8 reported other. Four teachers reported teaching in Kindergarten, 3 in 1st grade, 8 in 2nd grade, 7 in 3rd grade, 6 in 4th grade, 6 in 5th grade, 6 in 6th grade, 9 taught 7th grade, 9 taught 8th grade, 9 taught 9th grade, 14 taught 10th grade, 10 taught 11th grade, 8 taught 12th grade, and 1 taught adult education.

Technology Used

Teachers in Pinellas County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using Word processing, database, presentation, and Internet browsing one or more times a week. Authoring, spreadsheets, draw/paint/graphic, and concept mapping software packages were used less frequently by teachers. Fifty percent or more teachers reported their students used Internet browsing software at least once a week. Teachers reporting on the student use of word processing, spreadsheet, database, authoring, and concept mapping software were variable across the responses.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, blogging, wiki, and problem-solving software at least once a week. More than 30% of teachers reported not using process tools, testing, ebooks, and podcasting software at all. Thirty-five percent of teachers or more reported that their students used drill/practice/tutorial software once a week or more. Thirty-five percent of teachers or more report their students do not use planning, CD reference, blogging, wiki, process tools, ebook or podcasting software at all.

When looking at digital production software, both student and teacher use is much less frequent. Forty-five percent of teachers or more report never using podcasting and digital story telling software packages. Thirty-five percent or more teachers report using graphics organizer software once a week or more. Fifty-five percent or more teachers report their students never use digital audio, video, podcasting, or digital story telling software. According to 25% or more of the teachers, students use graphics organizers at least once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Pinellas County had different paths to professional certification. Twenty-three teachers came from approved college degree programs, 13 teacher earned college course certification, 10 earned district alternative certification, and 10 transferred from other states. Teachers reported an average of 13.84 (SD=10.77) years in the education profession, and an average of 5.65 (SD=4.77) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Professional Education (6), Agriculture 6-12 (1), Biology 6-12 (11), Chemistry 6-12 (6), Earth/Space Science 6-12 (1), Ed. Media Specialist PK-12 (1), Elementary Education K-6 (21), English 6-12 (6), ESOL (8), Exceptional Student Ed. K-12 (6), Hearing Impaired K-12 (1), Mathematics 6-12 (4), Middle Grade English 5-9 (1), Middle Grade Science 5-9 (9), Middle Grade Integrated Curriculum 5-9 (4), Middle Grade Mathematics 5-9 (2), Music K-12 (1), and Prekindergarten/Primary PK-3 (1).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	27%	36%	21%	14%	2%
Professional Development	2%	21%	36%	38%	4%
Independent learning	2%	18%	27%	52%	2%
Interaction with other faculty/staff	2%	14%	50%	30%	4%
Distance Learning courses	52%	21%	20%	4%	0%
Teaching and Learning Summer Institute	30%	21%	32%	14%	0%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Sixty percent or more of the teachers either strongly agreed or agreed to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	4%	4%	68%	25%
encourage me collaborate with my colleagues on technology integration.	0%	5%	9%	61%	25%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	2%	13%	66%	18%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
help me think about how technology may change my teaching practices.	0%	2%	5%	64%	29%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	16%	5%	55%	23%
encourage me to consider how technology can be used to facilitate student learning of content.	2%	2%	2%	61%	34%
focus on both the technical and instructional skills required to integrate technology.	0%	11%	7%	61%	20%
are traditionally in the form of after school workshops.	0%	11%	20%	59%	11%
are consistent and continual.	7%	13%	16%	59%	4%

Teaching and Instructional Practices: Student-Centered and Tool-based Teaching Practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Pinellas County report using computers for direct instruction, cooperative/collaborative learning, in centers, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	2%	5%	20%	18%	25%	30%
For team teaching	20%	32%	18%	14%	9%	7%
For cooperative /collaborative learning	4%	13%	29%	20%	23%	11%
In centers	11%	21%	23%	7%	18%	20%
For project-based learning	2%	9%	41%	20%	20%	7%
For sustained writing	11%	27%	20%	25%	11%	5%
For sustained reading	7%	36%	14%	16%	14%	11%
For independent inquiry/research	2%	7%	43%	21%	14%	13%
For student discussion/ communication	9%	45%	16%	14%	11%	5%
For instructional delivery	2%	7%	13%	20%	25%	34%
As a learning tool/resource	2%	4%	21%	20%	21%	32%
For student assessment	7%	27%	20%	23%	5%	16%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. Ninety-seven percent of the teachers responded that their schools had on-site computer support specialists and the remaining were unsure. In the schools involved with the *Leveraging Laptops* Program in Pinellas County, 1-3 technical support staff members were available with most teachers reporting having 1 or 2 available. Eighty-four percent of the teachers reported the staff was full-time, and 11% percent of the teachers reported the computer support specialists were grant-funded, indicating permanent positions were available. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	4%	13%	14%	43%	25%
The on-site computer specialist is dedicated to helping teachers.	4%	11%	9%	38%	38%
I have adequate access to our on-site computer specialist.	4%	16%	11%	52%	16%
I have to contact our specialist several times before I get assistance.	23%	20%	21%	27%	710%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	11%	16%	9%	34%	29%

Student Achievement

The teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom inquiry project summaries

Context	– 4-5 grade EH project based learning
AR Question	– Does the use of laptop technology increase 4th and 5th grade student's ability to perform better on assessments? – Are there greater learning gains made when technology is used as a reteaching tool for students who need learning interventions?
Data Collection Methods	– Test scores

Results	– Mean student test scores were higher for those students utilizing laptop technology. (Laptop = 6.25 vs. Board lecture = 5.5)
	– Time required to teach the lessons with laptop and standard board lecture were similar (20-35 min.).
	– Behavioral measures of students being off-task were similar for laptop and board instruction lessons (Laptop = 17 off-task events vs. Board = 20 off-task events).
	– Some lower functioning students became frustrated with manipulating the keyboard and mouse when participating in the laptop lesson.
Other Outcomes	– Lower functioning students or students less familiar with the technology actually struggled both on their testing and behaviorally.

Seminole

Seventy-eight teachers from four different schools in Seminole County participated in the *Leveraging Laptops* Program, and 54 (response rate of 69%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.

Setting

Teachers involved with the *Leveraging Laptops* Program from Seminole County reported an average of 22.91 (SD=3.68) students per class. The teachers reported an average of 4.08 (SD= 6.39) laptops and average of 3.24 (SD=3.48) desktops in their classrooms.

Two teachers reported teaching media/technology, 3 in special education, 24 in mathematics, 29 in science, and 5 reported other. Twenty-six teachers reported teaching 6th grade, 31 taught 7th grade, and 27 taught 8th grade.

Technology Used

Teachers in Seminole County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using Word processing, spreadsheet, presentation, and Internet browsing software one or more times a week. Authoring, database, draw/paint/graphic, and concept mapping software packages were used much less frequently by teachers (25% teachers reported not at all). Forty percent or more teachers reported their students use Word processing, presentation, and Internet browsing software at least once a month or more. Nearly 50% of teachers report their student do not use spreadsheets, database, draw/paint/graphic, authoring, and concept mapping at all.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning and CD reference at least once a week. More than 40% of teachers reported not using process tools, blogging, wiki, ebooks, testing and podcasting software at all. Fifty percent of teachers or more reported that their students did not use planning, CD reference, blogging, wiki, process tool, testing, ebook or podcasting software at all. Thirty-five percent of teachers or more report their students use Drill/practice/tutorial, and problem-solving at least once a month.

When looking at digital production software, both student and teacher use is much less frequent. Forty percent of teachers or more report using digital audio, video, and graphics organizer software packages at least once a month. Forty-five percent or more teachers report never using digital audio, video and podcasting software packages. Sixty percent or more teachers report their students never use digital audio, video, podcasting, and digital story telling software. According to 36% or more of the teachers, their students use graphics organizers at least once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Seminole County had different paths to professional certification. Nineteen teachers came from approved college degree programs, 21 teacher earned college course certification, 8 earned district alternative certification, and 6 transferred from other states.

Teachers reported an average of 13.56 (SD=9.56) years in the education profession, and an average of 5.65 (SD= 4.89) years of using computers in their classrooms for the delivery of instruction.

Teachers involved were certified to teach in many areas including Professional Education (1), Biology 6-12 (14), Business Education 6-12 (2), Chemistry 6-12 (2), Computer Science K-12 (1), Earth/Space Science 6-12 (1), Ed. Media Specialist PK-12 (2), Elementary Education K-6 (8), English 6-12 (1), ESOL (1), Exceptional Student Ed. K-12 (7), Guidance and Counseling PK-12 (1), Health K-12 (1), General Knowledge (1), Marketing 6-12 (1), Mathematics 6-12 (8), Middle Grade English 5-9 (2), Middle Grade Science 5-9 (21), Middle Grades Integrated Curriculum (4), Middle Grade Mathematics 5-9 (16), Physics 6-12 (1), Pre-Kindergarten/Primary PK-3 (1), and Social Sciences 6-12 (2).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	26%	26%	24%	19%	4%
Professional Development	4%	26%	32%	33%	6%
Independent learning	2%	15%	35%	37%	930%
Interaction with other faculty/staff	0%	30%	37%	28%	6%
Distance Learning courses	59%	20%	11%	6%	2%
Teaching and Learning Summer Institute	0%	26%	24%	19%	32%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Ninety percent or more of the teachers either strongly agreed or agreed to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	0%	9%	55%
encourage me collaborate with my colleagues on technology integration.	0%	9%	0%	9%	55%

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	0%	0%	18%	46%
help me think about how technology may change my teaching practices.	0%	0%	0%	9%	55%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	0%	0%	9%	73%
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	0%	0%	82%
focus on both the technical and instructional skills required to integrate technology.	0%	0%	0%	18%	64%
are traditionally in the form of after school workshops.	0%	0%	9%	46%	18%
are consistent and continual.	9%	0%	0%	27%	46%

Teaching and Instructional Practices: Student-Centered and Tool-based teaching practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Seminole County report using computers for direct instruction, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	15%	22%	11%	26%	26%
For team teaching	19%	56%	13%	6%	4%	4%
For cooperative /collaborative learning	2%	15%	4,440%	20%	17%	2%
In centers	17%	44%	26%	7%	4%	2%
For project-based learning	2%	15%	48%	22%	9%	4%
For sustained writing	15%	63%	13%	4%	4%	2%
For sustained reading	15%	65%	9%	4%	2%	6%
For independent inquiry/research	0%	19%	43%	22%	7%	9%
For student discussion/ communication	4%	35%	22%	17%	15%	7%

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For instructional delivery	2%	13%	15%	11%	37%	22%
As a learning tool/resource	0%	6%	30%	11%	28%	26%
For student assessment	0%	35%	17%	9%	17%	22%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All teachers responded that their schools had on-site computer support specialists with the exception of one stating they were unsure. In the schools involved with the *Leveraging Laptops* Program in Seminole County, from one to three technical support staff members were available with most teachers reporting having one or two. Ninety-one percent of the teachers reported the staff was full-time, and only 4% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff are shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	6%	6%	9%	43%	35%
The on-site computer specialist is dedicated to helping teachers.	4%	6%	9%	43%	37%
I have adequate access to our on-site computer specialist.	7%	7%	15%	41%	28%
I have to contact our specialist several times before I get assistance.	19%	39%	20%	15%	6%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	9%	13%	35%	32%	9%

Student Achievement

The teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. District Classroom Inquiry (AR) Topics and Results

Context	– 6th grade science fungus with internet research and presentation
AR Question	– Does the use of in-class laptop technology enable my three Magnet classes of sixth grade science students to more effectively conduct guided internet research about the Amphibian Chytrid Fungus Crisis, and if so, does this in-class technology foster increased critical thinking skills among my students using cooperative learning strategies and the team approach to create power point reports?

Data Collection Methods	– Student Artifacts
Results	– Groups varied in their group dynamic and their skill – It is difficult to make any final judgments about this since the project was interrupted and restarted due to issues beyond my control. – I do believe it is necessary and cost-effective to have this technology, but I also know that it is going to take time to fully actualize the investment made.
Other Outcomes	– Technology and group methods will take time to refine, but are necessary. – Students vary in their preparation to do group work and technical work. – I will keep using this technology and will keep trying. I also will be looking for ways to make the process run more smoothly. – I will offer my principal my recommendations for training other teachers at my school.

Context	– 7th grade science digital stories
AR Question	– Does using laptops and Excel to complete a nutrition activity, traditionally done with paper, pencils and calculators result in increased motivation?
Data Collection Methods	– Survey
Results	– Groups using computers enjoyed the activity more. (On the survey, Group 1 did not have an attitudinal rating over 7 while group 2 had much higher ratings from 7 to 10.) – Open-ended survey responses showed that students preferred computer-related activities because the methods are new and exciting and because of the opportunity to work with friends.
Other Outcomes	– The research indicates that students remain on task better when using laptop computers. – It also indicates that they like learning new things.

Context	– 6th grade science ocean floor modeling with motion sensors
AR Question	– Does small groups of sixth grade Science students using motion detectors to map a model of the ocean floor increase the students' ability to write detailed descriptions of how sonar is used to explore the ocean?
Data Collection Methods	– Student artifacts
Results	– 29% of the students added one detail to their description of how sonar can be used. – 60% percent added two or more details to their description of how sonar can be used. – Small groups of sixth grade Science students using motion detectors to map a model of the ocean floor did increase the students' ability to write detailed descriptions of how sonar is used to explore the ocean.

Other Outcomes	– Laptops give students the opportunity to experience simulations that would not be possible without the technology and software.
	– These first hand experiences help provide background knowledge for students to base future learning.
	– Students' writings improved with the use of more vivid vocabulary and detailed descriptions.
	– I will offer to hold workshops to familiarize my colleagues with the use of laptops and associated hard and software to enhance learning in their classrooms.

Context	– 8th grade physical science with webquests and presentations
AR Question	– Does using laptops to gather information by completing web quests help increase 8th graders understanding of Newton's laws of motion?
Data Collection Methods	– Test scores
	– Student artifacts
	– Informal interviews
	– Anecdotal records
Results	– Only two students knew about Newton's first law of motion on the pre-test.
	– There were differences in post-test scores based on strategies used (traditional instruction =57%; Webquest =64%, Webquest & student-created presentation = 70%)
	– The use of laptops both to gather information and present knowledge motivated students.
Other Outcomes	– While using laptops and the Internet are helpful for both motivation and information gathering they can't entirely take the place of textbooks.
	– I will work with the other teachers on my team to both give them ideas and use their ideas about how to further integrate technology in my lessons.

Context	– 6th grade science weather data with Inspiration
AR Question	– Will using Inspiration improve analysis of data collection with 6th grade gifted students?
Data Collection Methods	– Test scores
	– Student artifacts
Results	– The students used technology to organize their data used more detail in the written portion of their test.
	– The average overall test score was 2% higher for the students using technology.
Other Outcomes	– Time and access to technology could be limiting factors to successful technology use.

Context	– 7th grade math with spreadsheet
AR Question	– Will the use of Microsoft EXCEL increase the ease and ability of 7th grade advanced math students in Pre-algebra to analyze data and generate a circle graph?
Data Collection Methods	– Student artifacts

Results	– Student results and attitudes regarding this activity ranged from very positive to negative.
	– The level of frustration was very high with some of the students who were using the laptops to complete the same activity. In part, this could be attributed to their inexperience in using Microsoft EXCEL, or that they had to share the laptops.
Other Outcomes	– I would restructure this inquiry to provide the students with some time in getting acclimated to the software.

Context	– 7th grade at-risk behavior with probes, doc cam, and laptops
AR Question	– How do the use of Laptops, Elmos and Probes increase the desired classroom behaviors of at risk students in my 7th grade level class?
Data Collection Methods	– Field notes
	– Reflective journal
Results	– I found that the students were enthusiastic and stayed on task.
	– Students viewed me as a partner taking direction as a fellow collaborator.
	– Students also took on ownership of their learning and started directing their own learning
	– My "At Risk" students who were normally disinterested became very interested in the lessons. They displayed more positive behaviors including taking on leadership roles in a group and helping others.
Other Outcomes	– Technology does reach students who normally tune out of school.
	– The technology does not eliminate negative behaviors but it does get the students attention
	– Student lessons were shared in a school fair
	– I plan to use the skills I have learned to create a project using laptops and other technology on Invasive species to focus learning on a critical problem that faces our state.

Context	– 4th grade gifted math with Blackboard
AR Question	– Can a cooperative group of 4 gifted students (one seventh grade, three eighth grade) achieve mastery of complex mathematical concepts through independent, accelerated study using BlackBoard?
Data Collection Methods	– Test scores
	– Journals
	– Student artifacts
	– Informal interviews
	– Reflective journals
Results	– This research demonstrates that mastery of a difficult mathematical concept (solution of quadratic equations including use of the quadratic formula and its discriminant) can be attained through independent, accelerated group study.
	– The availability of assistive technology such as laptops with wireless internet access and the TI 84 calculator proved invaluable in helping these students achieve high results (mid to upper nineties) on their unit tests.
	– This level of mastery is compared to the results in the rest of the class (teacher assisted learning) which, for any comparable group of 4 students, was 6 to 8 points lower on a simpler test.

Other Outcomes	– Wireless networked laptop assistive technology made it feasible to look at BlackBoard as a vehicle to enable independent study in the appropriate setting during regular class time.
	– There is still a time investment requirement by the teacher to set up the modules in BlackBoard. However once that is complete, only maintenance will be required for future classes.
	– I will develop a series of independent study modules in BlackBoard for the acceleration of the mathematically talented students in my Algebra I Honors classes.

Taylor

Twenty teachers from two different schools in Taylor County participated in the *Leveraging Laptops* Program, and 18 (response rate of 90%) of these teachers responded to a survey pertaining to teacher professional development experiences and perceptions, and use of computers in the classroom. Additionally, schools were observed with the School Observation Measure (SOM) and Survey of Computer Use (SCU). Classroom observations were made in the fall and spring semesters at the schools. Student performance information is provided as a result of the work of the teachers who completed classroom inquiry projects. The summaries of these projects document the effects of classroom technology on a range of students.

Setting

Teachers involved with the *Leveraging Laptops* Program from Taylor County reported an average of 24.33 (SD=5.1) students per class. The teachers reported an average of 31.11 (SD= 17.59) laptops and average of 5.78 (SD=17.34) desktops in their classrooms. Four teachers reported teaching English, 1 in special education, 7 in mathematics, 13 in reading, 6 in science, and 4 in social science.

Technology Used

Teachers in Taylor County used productivity software packages more than other software classifications. Fifty percent or more teachers reported using Word processing, database, presentation, and Internet browsing one or more times a week. Authoring, spreadsheets, draw/paint/graphic, and concept mapping software packages were used much less frequently by teachers. Fifty percent or more teachers reported their students used Word processing, draw/paint/graphic, presentation, and Internet browsing software at least once a week or more. Teachers reporting on the student use of spreadsheet, database, authoring, and concept mapping software were variable across the responses.

Teachers and students also used other software packages. Fifty percent or more teachers reported using planning, CD reference, blogging, wiki, Problem-solving and testing software at least once a week or more. More than 50% of teachers reported not using process tools, ebooks, and podcasting software at all. Fifty percent of teachers or more reported that their students did use CD reference, Drill/practice/tutorial, and problem-solving software once a week or more. Thirty-five percent of teachers or more report their students do not use planning, blogging, wiki, process tools, ebook or podcasting software at all.

When looking at digital production software, both student and teacher use is much less frequent. Seventy percent of teachers or more report never using podcasting and digital story telling software packages. Fifty percent or more teachers report using digital audio, video and graphics organizer software once a month or more. Fifty percent or more teachers report their students never use graphics organizers, podcasting, or digital story telling software. According to 50% or more of the teachers, students use digital audio and graphics organizers at least once a month.

Professional Development

Teachers involved with the *Leveraging Laptops* Program from Taylor County had different paths to professional certification. Seven teachers came from approved college degree programs, seven teachers earned college course certification, three earned district alternative certification, and one transferred from another state.

Teachers reported an average of 9.25 (SD= 7.96) years in the education profession, and an average of 3.19 (SD= 3.46) years of using computers in their classrooms for the delivery of instruction. One teacher reported teaching 6th grade, one taught 7th grade, 9 taught 8th grade, 9 taught 9th grade, 1 taught 10th grade, and 1 taught 11th grade.

Teachers involved were certified to teach in many areas including Professional Education (3), Biology 6-12 (3), Business Education 6-12 (2), Chemistry 6-12 (3), Earth/Space Science 6-12 (1), Elementary Education K-6 (4), English 6-12 (2), ESOL (1), Exceptional Student Ed. K-12 (3), General Knowledge (1), Mathematics 6-12 (1), Middle Grade English 5-9 (2), Middle Grade Science 5-9 (1), Middle Grade Mathematics 5-9 (4), Middle Grade Social Sciences 5-9 (1), Reading K-12 (4), and Social Sciences 6-12 (2).

Teachers reported acquiring their computer skills from a variety of sources, including as part of their college coursework, professional development, independent learning, interaction with other faculty and staff, distance learning courses, and the teaching and learning summer institutes. Table 1 shows the responses.

Table 1. Source of computing skills.

Computer Skills Source	Not at all	To a small extent	To a moderate extent	To a great extent	Entirely
As part of your college coursework	22%	22%	28%	22%	6%
Professional Development	0%	17%	22%	61%	0%
Independent learning	6%	22%	22%	50%	0%
Interaction with other faculty/staff	0%	33%	39%	28%	0%
Distance Learning courses	28%	22%	39%	11%	0%
Teaching and Learning Summer Institute	11%	22%	28%	39%	0%

Teachers were asked to provide their attitudes towards their professional development opportunities. Table 2 illustrates the responses. Overall attitudes were positive. Ninety percent or more of the teachers either strongly agreed or agreed to each of the positively stated categories.

Table 2. Teacher attitudes toward professional development opportunities.

Professional development opportunities…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to think about how technology can support my teaching goals.	0%	0%	0%	9%	55%
encourage me collaborate with my colleagues on technology integration.	0%	9%	0%	9%	55%
encourage me to think about the contextual factors in my school that support or hinder my technology integration efforts.	0%	0%	0%	18%	46%
help me think about how technology may change my teaching practices.	0%	0%	0%	9%	55%
provide me with relevant knowledge, skills and abilities I can immediately use in my classroom.	0%	0%	0%	9%	73%

Professional development opportunities...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
encourage me to consider how technology can be used to facilitate student learning of content.	0%	0%	0%	0%	82%
focus on both the technical and instructional skills required to integrate technology.	0%	0%	0%	18%	64%
are traditionally in the form of after school workshops.	0%	0%	9%	46%	18%
are consistent and continual.	9%	0%	0%	27%	46%

Teaching and Instructional Practices: Student-Centered and Tool-based Teaching Practices

Teachers involved with the *Leveraging Laptops* Program reported the various teaching methods supported by the computers. Table 3 illustrates the responses. Fifty percent or more of teachers involved with the program in Taylor County report using computers for direct instruction, cooperative/collaborative learning, project-based learning, for sustained reading, independent inquiry/research, instructional delivery, and as a learning tool/resource one or more times a week.

Table 3. Instructional method supported by computers.

Teaching method	NA	Not at all	Once a month or less	Once a week	Several times a week	Every day
For direct instruction	0%	11%	11%	17%	50%	11%
For team teaching	17%	28%	22%	22%	11%	0%
For cooperative /collaborative learning	0%	22%	17%	17%	44%	0%
In centers	11%	50%	17%	0%	17%	6%
For project-based learning	0%	17%	22%	17%	33%	11%
For sustained writing	6%	22%	33%	28%	11%	
For sustained reading	0%	28%	17%	33%	17%	6%
For independent inquiry/research	0%	22%	6%	22%	39%	11%
For student discussion/ communication	0%	28%	22%	28%	17%	6%
For instructional delivery	0%	22%	6%	11%	44%	17%
As a learning tool/resource	0%	6%	11%	17%	33%	33%
For student assessment	0%	22%	39%	22%	17%	0%

Support

Teachers responded to a number of survey items pertaining to technical and instructional support. All teachers responded that their schools had on-site computer support specialists. In the schools involved with the *Leveraging Laptops* Program in Taylor County, 1-3 technical support staff members were available with most teachers reporting having one available. Seventy-eight percent of the teachers reported the staff was

full-time, and 50% percent of the teachers reported the computer support specialists were grant-funded. Responses about the type of support provided by the technical staff is shown in Table 4.

Table 4. Teacher perception of technical support.

Teacher perspective	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The on-site computer specialist adequately assists me in problem solving and trouble shooting.	11%	0%	22%	22%	44%
The on-site computer specialist is dedicated to helping teachers.	6%	6%	22%	22%	44%
I have adequate access to our on-site computer specialist.	6%	11%	22%	28%	33%
I have to contact our specialist several times before I get assistance.	39%	39%	11%	6%	6%
Our computer specialist demonstrates techniques to integrate computer technology into classroom instruction.	11%	0%	33%	28%	28%

Student Achievement

The five teachers who completed classroom inquiry projects each focused on a different aspect of the effects of classroom technology on student performance. Their questions, data collection methods, and results are summarized in Table 5.

Table 5. Classroom Inquiry (AR) Topics and Results

Context	– 9th grade research and reference in history with Internet
AR Question	– When given a project topic to investigate will 9th grade level 2 FCAT students use research and reference skills to make a report and presentation?
Data Collection Methods	– Student artifacts – Rubrics Literature
Results	– Students did a wonderful job of using the internet and other research tools such as Encarta to complete research on a variety of topics.

Context	– 9th grade study skills with internet research and tutorials
AR Question	– Has providing 9th grade students with laptops helped to motivate them to learn more and improve their study skills in the hope of improving their FCAT achievement levels?
Data Collection Methods	– Test scores – Student artifacts – Anecdotal records – Rubrics
Results	– Math scores improved after tutorials – Reading scores improved after internet research and presentation – Engagement and motivation appeared to improve

Other Outcomes	– Students were able to access more information and make more appropriate analysis of data. It enabled students to take more ownership of their overall learning process.
	– We do not have a say in who uses laptops for next year. This decision is to be made by the principal and other administrators. I recommend to keep technology with high need students.

Context	– 9th grade earth science
AR Question	– How does the use of laptop computers (and Internet access in particular) influence recall, engagement, and time on task in a population of 9th grade earth space science students?
Data Collection Methods	– Test scores – Journals – Student artifacts – Informal interviews – Anecdotal records – Rubrics
Results	– Students test scores have improved by 10% since implementing computer based instruction. – Students have become much more stimulated to be involved in classroom activities (anecdotal records). – Students look forward to assignments, and work that they turn in continues to improve (anecdotal records, sample assignments).
Other Outcomes	– The basic conclusion from my findings is that student engagement increases from using technology. The corollaries to this conclusion are that time on task increases, and retention and/or ability to manipulate material learned in other environments improve as well.·I intend to expand my coursework in this area to better help me to implement technology in the classroom. – I have advocated expanding this program to include other grade levels. – I have served as a mentor teacher to other instructors wishing to implement similar programs in their classrooms.

Appendix E. Project Outcome Dissemination Outlets

Practitioner based articles and presentations

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
Florida Educational Technology Conference (FETC) January 22-25, 2008 Orlando	**http://www.fetc.org/fetc2007/index.cfm**	July 13, 2007 http://cfp.fetc.org/submitinstructions.cfm	**Michael Eason, Executive Director Application available online**
National Educational Computing Conference June 24-June 27, 2007 Atlanta, Georgia	http://center.uoregon.edu/ISTE/NECC2007/glance/welcome.php	**San Antonio, TX June 29-July 2, 2008 Submission Due October 3, 2007**	**http://center.uoregon.edu/ISTE/NECC2008/program/neccprogram@iste.org**
K-12 Conference and Innovation Fair Oct. 2-5, 2007 Orlando	http://www.fldoe.org/k12/conference/	**July 16, 2007 breakout sessions**	**Registration Deadline 9/11/2007**
FL League of Middle Schools	**http://www.flms.org/conf.htm**	**TBA**	Kathy Shewey ks8184@aol.com (352)955-7650
Florida Association of District School Superintendents Leadership Conference September 19-21, 2007 Tampa	http://www.fadss.org/	Deadline Passed	**William J. "Bill" Montford, III, Chief Executive Officer**
Florida Association for Media in Education Literacy Rocks October 10-12 Orlando	http://www.floridamedia.org/conference/conference.html	Deadline Passed	Co-Chairs Sandra McMicheal Email: SandyMc@bellsouth.netVic Burke Email: Vic.Burke@marion.k12.fl.us
National Association for Supervision and Curriculum Development Conferences	http://www.ascd.org/portal/site/ascd/menuitem.d81fa51cf13ac9dd12c7c91061a001ca/;jsessionid=G4kAYc1EpBz78WGl6bmbJqnEAq7MYBnvGKLOdW194LUVdPlacVJd!-91809162	Conference Connecting Instruction and Assessment Atlanta Georgia Oct. 19-21, 2007 National Conference New Orleans, LA March 15-17, 2008	Deadline: For National Conference generally late May, early June
Florida Association of Science Teachers Oct. 25-27 2007 Orlando, FL	http://www.fastscience.org/	Presentation deadline Link: http://www.fastscience.org/dl/forms/conference/FAST_2007/FAST_2007_Call_for_Presenter.pdf No date listed	Lori Braga 2700 Crooked Antler Drive Melbourne, Fl 32934

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
Nat'l Middle School Assoc. Conference November 8-10, 2007 Houston, TX	http://www.nmsa.org/annual/	Sep 1, 2007	dherlensky@nmsa.org
National Science Teachers Association March 27–30, 2008 Boston, MA	http://www.nsta.org/	National : New Orleans, LA: March 19–22, 2009 Regional: Birmingham, AL Dec. 6-8, 2007 Charlotte, NC Oct. 30,2008	Proposals Generally accepted one year prior in the late Summer / Early Fall for regional and National Conferences
Florida Council of Teachers of Mathematics Conference October 11-13, 2007 Orlando, FL	http://www.fctm.net/	Math Rocks Orlando, FL	Proposal Due: July 31, 2007
National Council of Teachers of Mathematics	http://www.nctm.org	Regional Conferences are available: http://www.nctm.org/conferences/default.aspx?id=52 National Conferences: Salt Lake City April 2008 Washington, DC April 22-25, 2009	Proposals: Generally Open Late October/Early November with Submission Due by April/May Be A Speaker information: http://www.nctm.org/conferences/content.aspx?id=450
Article I. National Council of Teachers of Mathematics Research Committee and AERA Special Interest Group/Research in Mathematics Education	http://www.nctm.org/conferences/content.aspx?id=9550	Research Pre-Session April 7-9, 2008 Salt Lake City, Utah Deadline for Submission: August 1, 2007	http://www.nctm.org/conferences/content.aspx?id=3744&ekmensel=c580fa7b_14_550_btnlink
Florida Council of Teachers of English October 18-20 Orlando, FL	http://www.fcte.org/	Generally May	See yearly calendar for more important info: http://www.fcte.org/Calendar.htm
National Council of Teachers of English	http://www.ncte.org/	Convention: April 2-5, 2008 Deadline generally in May	Proposal Info not yet available Pdf of 2007 Convention Info: http://www.ncte.org/cccc/conv
Florida Council for Social Studies October 10 – 13, 2007 Orlando	http://www.fcss.org/	Contact via online form at@http://www.fcss.org/index.cfm/fuseaction/Contact.Home	Presentation deadline May Facilitator Deadline Sept. 1, 2007
National Council for the Social Studies Nov. 30-Dec. 2, 2007 San Diego, CA	http://www.ncss.org	Upcoming Conference Houston, TX November 14-16, 2008	Submission Info: Generally December for the upcoming year. Deadlines end of January/Early February

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
International Reading Association	http://www.reading.org/	Annual Convention Atlanta 2008 Info forthcoming; http://www.reading.org/association/meetings/annual.html	Generally Due one year in advance
Florida Reading Association September 6 – 9, 2007 Orlando, FL	http://www.flreads.org/	http://www.flreads.org/Annual%20Conference/45thConference/45th_conference.htm	Generally Due Early March
Florida League of Middle Schools	http://www.flms.org/member.htm	Call for Articles:http://etc.usf.edu/laptops4learning/index.html Prelim. Proposals Due August 15	Kara Dawson dawson@coe.ufl.edu
The Core (FL DOE)	For more information on this electronic newsletter, please e-mail thecore@fldoe.org.	Archived Issues available at http://www.fldoe.org/newsletter/	
The Digital Educator	http://etc.usf.edu/fde/index.htm		
Learning and Leading with Technology	http://www.iste.org/Content/NavigationMenu/Publications/LL/Submit_Articles/LL-SubmissionKit.pdf	Innovative Learning Technologies Sept. 4, 2007 Envisioning the Future December 10,2007	Kate Conley kconley@iste.org.
T.H.E. Journal	http://www.thejournal.com	Editorial Calendar http://thejournal.com/the/magazine/editorialcalendar/	Wendy LaDuke Publisher (949) 265-1520 wladuke@1105media.com
Florida Association for Supervision and Curriculum Development	http://www.fascd.org/	Dimensions Online Deadline ongoing	Kim Pearson, Executive Director, 11225 Kapok Grand Circle Madeira Beach, FL 33708 727-871-1112 fascd@fascd.org
Educational Leadership	http://www.ascd.org/portal/site/ascd/menuitem.a4dbd0f2c4f9b94cdeb3ffdb62108a0c/ Published by ASCD Association for Supervision and Curriculum Development	Themes 2007-2008: http://www.ascd.org/portal/site/ascd/menuitem.92eee03dd834935fb85516f762108a0c/#07-08 Submission Guidelines http://www.ascd.org/portal/site/ascd/menuitem.38ad86a43cee884fb85516f762108a0c/	Marge Scherer, Editor in Chief Educational Leadership 1703 N. Beauregard St. Alexandria, VA 22311-1714

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
Middle School Journal National Middle School Assoc.	http://www.nmsa.org/ Publications/ MiddleSchoolJournal/ Articles/tabid/109/ Default.aspx	Publ. 5 times yearly: Sept 1,2007 call for manuscripts – Integrating Technology	Cheri Howman at howmanc@nmsa.org.
Middle Ground National Middle School Assoc. Conference	http://www.nmsa.org/ Publications/ MiddleGround/ GuidelinesforAuthors/ tabid/629/Default.aspx	On-going	Patricia George, Editor Middle Ground 37864 Alberts Farm Dr Purcellville, VA 20132
Research in Middle Level Education Online	http://www.nmsa.org/ Publications/ RMLEOnline/tabid/ 426/Default.aspx	Submission Guidelines http:// www.nmsa.org/Publications/ RMLEOnline/ GuidelinesforContributors/ tabid/592/Default.aspx	Micki Caskey Portland State University caskeym@pdx.edu
Florida Council for the Social Studies Social Studies Trends and Issues	http://www.fcss.org/ index.cfm/fuseaction/ Publications.Home	Contact : publications@fcss.org	Dr. Hillary Landorf Florida International University landorfh@fiu.edu
National Council for the Social Studies	http:// www.socialstudies.org /publications/teachers/ http:// www.socialstudies.org /publications/	Guidelines include call to teachers to write as well as publishing info * New call to authors http:// www.socialstudies.org/ publications/teachers/ Social Studies and the Young Learner Challenge Due July 1,2007 http:// www.socialstudies.org/ teachers/smallworld	The Editors National Council for the Social Studies 8555 Sixteenth Street, Suite 500 Silver Spring, Maryland 20910 Voice: 301 588-1800 ext 122 Fax: 301 588-2049 E-mail: publications@ncss.org Social Education E-mail both Michael Simpson and Jennifer Bauduy at msimpson@ncss.org and jbauduy@ncss.org Middle Level Learning E-mail Steve Lapham, slapham@ncss.org Social Studies and the Young Learner E-mail Linda Bennett ssyl@missouri.edu
Florida Council of Teachers of English	http://www.fcte.org/ Publications.htm	Deadlines Vary; publications Include online FCTE Newsletter and The Florida English Journal	Contact cglaeser77@msn.com with ideas or questions
National Council of Teachers of English	http://www.ncte.org/ pubs/journals	Voices from the Middle: Call for Manuscripts: September 1, 2007 http://www.ncte.org/ pubs/journals/vm List of Journals: http:// www.ncte.org/pubs/journals	Submission Information http://www.ncte.org/pubs/ publish/journals

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
International Reading Association	http://www.reading.org/publications/index.html	The Reading Teacher & Journal of Adolescent & Adult Literacy varies; published 8 times yearly	The Reading Teacher or the Journal of Adolescent & Adult Literacy Submission Guidelines http://www.reading.org/publications/for_authors/rt_jaal.html
Florida Reading Association	http://www.flreads.org/Publications/publicat.htm	Florida Reading Quarterly August 1, October 1, February 1 FRA Teachers on the Cutting Edge April FRA Newsletter Sept. 15, Dec. 15, Feb. 15, May 15	Florida Reading Association at FRA Membership Post Office Box 12187, Tallahassee, Florida 32317
Florida Science Teachers Association	http://www.fastscience.org/journal.php	F.A.S. T. Journal Deadline: Ongoing	Karen Malesky 9501 SR 64E Bradenton, Fl 34202 (941) 714-7240x255 (w) (941) 714-7245 fax
National Science Teachers Association	http://www.nsta.org/	Science and Children (elementary) *Methods & Strategies—On-going Deadlines Aug. 1-Nov.1, 2007* Jan. 2008: Properties of Materials * Feb. 2008: Powers of Observation * March 2008: Force and Motion *April/May 2008: Assessment/Classroom-Based Professional Development Science Scope (middle level) Math and Science Integration— Deadline: July 31, 2007 The Science Teacher (high school)	Author Information and Call for Proposals http://www.nsta.org/publications/journals.aspx#authors
Florida Council of Teachers of Mathematics Conference National Council of Teachers of Mathematics	http://www.nctm.org	*Teaching Children Mathematics Mathematics Teaching in the Middle School Mathematics Teacher 2010 Yearbook Special Edition The K–12 Mathematics Curriculum: Issues, Trends, and Future Directions Submissions Due December 1 Call for Manuscripts http://www.nctm.org/publications/content.aspx?id=9404&ekmensel=c580fa7b_116_118_btnlink	General Guidelines: http://www.nctm.org/publications/default.aspx?id=218

Conferences	Website	Upcoming Topics/deadlines	Contact/General Information
American Association of School Librarians	http://www.ala.org/ala/aasl/schlibrariesandyou/k12students/k12students.cfm	Knowledge Quest http://www.ala.org/ala/aasl/aaslpubsandjournals/kqweb/aboutkq/authorguide.cfm	Knowledge Quest Debbie Abilock kq@abilock.net Associate Editor Gayle Bogel gbogel@gmail.com
Florida Media Quarterly	http://www.floridamedia.org/fmq/fmqauthors.html	Emergent Trends in Media Programs August 1 Promoting Your Media Program November 1 Evaluating Your Media Program February 1 Tips for a Successful Media Program May 1	Pat Dedicos, FMQ Editor, at dedicosp@educationcentral.org