

Mississippi Teacher Leadership Project

Year 1 Evaluation Report

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Fouts & Associates, L.L.C

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EXECUTIVE SUMMARY

The Mississippi Teacher Leadership Project is a program designed to assist teachers in their efforts to integrate technology into the curriculum. Funded by the Bill & Melinda Gates Foundation and administered by the Mississippi State Department of Education, the primary goal of the program is to encourage and facilitate teachers in their efforts to provide technology expertise and leadership in and beyond their own schools. During the first year of the project 27 teachers were awarded MSTLP grants, and it is expected that an additional thirty teachers will be selected to participate during the 2003-2004 school year. Data were gathered from several different sources to answer four evaluation questions. Sources included reflective journal responses, classroom observations, teacher interviews, a pre-post Technology Use Survey for Teachers, and a Technology Use Student Survey.

Evaluation Questions

Evaluation Question 1: *Are Mississippi TLP teachers integrating and using the technology in their classrooms as intended?*

It appears that after their first full year of training, Mississippi teachers are indeed making progress in using technology to support teaching and learning. Although teachers' efforts were influenced by a number of variables, including level of experience, administrative and technical support, and availability of functional hardware and appropriate software, evidence from journals, surveys, and observations suggests that teachers did find ways to provide students with meaningful, technology-enhanced learning experiences. While there was a tendency among these teachers to integrate technology into traditional lessons plans and projects, it is likely that as they become more experienced in using computers to support teaching and learning, their efforts will become more highly developed.

Evaluation Question 2: *What successes and challenges have the Mississippi teachers experienced?*

Mississippi teachers and their students experienced many successes, as well as many challenges during the year, according to journal responses. Specific curriculum lessons and projects, student and parent reactions, and personal and professional growth were among the positive outcomes shared by teachers. They were generally pleased with their attempts to design and teach integrated lessons and suggested that the technology had a positive impact on student attitudes and behavior. On the other hand, time pressures, technical glitches, and student management issues proved frustrating and challenging to teachers. Despite these challenges, however, teachers were consistently positive about the benefits of using technology in the classroom and were optimistic about the impact on teaching and learning.

Evaluation Question 3: *What effect has training had on teaching and the classroom?*

The impact of the Mississippi Teacher Leadership Project on teaching and learning and on the classroom was positive according to a majority of MSTLP participants. Teachers found that their students were more motivated to learn when technology was present, and there was also evidence that students were more collaborative, more self-directed, and more often on task. And while teachers were cautious in suggesting that technology led to higher achievement, they did share the general opinion that students were academically richer because of their exposure to technology. The fact that students had anytime access to current information through the Internet was powerful, according to teachers, and encouraged them in their research efforts. Teachers were also convinced that students were being better prepared for the “real world” in becoming skilled users of technology.

Evaluation Question 4: *What leadership activities have the teachers performed during the year?*

Mississippi TLP participants were most likely to provide leadership by offering technical assistance and informal instruction to their building colleagues. In rare instances they offered formal classes, in-services, and presentations outside of their own buildings. The relatively limited degree to which MSTLP teachers assumed leadership responsibilities is understandable. Research on technology training programs suggests that teachers’ initial efforts to integrate the computers and related technology into the curriculum are intense and leave little time for additional responsibilities. For many teachers this changes during the second year and beyond as they become more proficient and their integration efforts become more natural. This may well be the case for Mississippi teachers.

Conclusions and Recommendations

The Mississippi Teacher Leadership Project, funded by the Bill & Melinda Gates Foundation and administered by the Mississippi State Department of Education, provided training to twenty-seven teachers during the 2002-2003 school year to further their efforts in integrating technology into the curriculum. The training was intended to support and encourage teachers in the appropriate use of technology to support teaching and learning. The evaluation of the MSTLP was designed to determine the extent to which these goals were met. Data from teacher’s reflective journals, classroom observations, and teacher and student surveys were used to address four general evaluation questions.

Findings revealed that the Mississippi Teacher Leadership Project offered teachers a sound, practical training program to assist them in using educational technology in the classroom. The structure and content of the MSTLP is consistent with many of the conditions identified in research literature as being critical to successful integration. These include in-depth and ongoing training, hands-on learning experiences, and a focus on curriculum design and integration. Teachers were enthusiastic about the training sessions and particularly about the expertise of the trainers. Once back in their

classrooms the MSTLP teachers were challenged, yet confident, as they began their efforts to use technology to support teaching and learning.

Their integration efforts resulted in several important outcomes. First, teachers were both more deliberate and more creative in planning curriculum lessons. Their classrooms tended to be more student-centered, and in implementing technology projects they were more likely to facilitate student learning rather than to direct it. Teachers suggested several benefits to students as well. Motivation, on-task behavior, self-directed learning, and collaboration all increased for students in technology-rich classrooms. Students themselves reported being more interested in their school assignments and felt that they took more responsibility for their own learning. And while there was little hard evidence that student achievement increased in MSTLP classrooms, there was a general sense among participants that when students were more engaged in their tasks, they were indeed learning more.

Mississippi teachers experienced several challenges during the year beginning with the late arrival of their computers and software. As the year progressed and they were able to use their equipment on a more consistent basis, their efforts were compromised by a lack of time to explore programs and plan lessons, as well as technical glitches and student management issues. Still, they remained positive about the benefits of technology for improving teaching and learning and believed the successes outweighed the challenges.

A goal of the Mississippi Teacher Leadership Project is to support and encourage teachers to share their training and expertise with their colleagues, and results of this evaluation suggest that this goal was realized to some extent. Most of the MSTLP teachers provided technical support and advice at the building level, and many of them offered informal training in the use of Power Point and the Internet for research. Students were part of this collaboration as well, often sharing their Power Point presentations with other classes across the school. Several teachers participated in school or district technology planning committees, and some teachers recruited colleagues to participate in the next round of MSTLP training.

Mississippi teachers made important progress in their beginning efforts to integrate technology into the curriculum. Some teachers were most comfortable using the technology to teach the curriculum in fairly traditional ways, while those with more computer experience were able to design lessons that maximized the power of the technology. The range of their implementation efforts is consistent with research findings on the process of technology integration which suggests that there is “no quick path to fully mature teaching with technology” (Martin, Gersick, Nudell, & Culp, 2002, p. 10). While most MSTLP teachers will continue to develop their technical skills over the next several years, both teacher and students found first-year benefits to having access to technology in the classroom.

Recommendations

1. The Mississippi Teacher Leadership Project, based on Washington's Teacher Leadership Project, is a strong professional development model that provided 27 Mississippi teachers with a sound foundation in technology integration. The focus on curriculum, the expertise of the instructors, and the follow-up training sessions are key to the program's success. It is highly recommended that the program continue to emphasize curriculum design and to provide numerous opportunities for teachers to share their questions and accomplishments.
2. The Mississippi State Department of Education did a commendable job of administering the Mississippi Teacher Leadership Project, providing the support and resources necessary to facilitate a positive experience for teachers and trainers. It is expected that this level of support will continue as a new cohort of teachers is trained beginning in the summer of 2003. Beyond that, the degree to which they can provide ongoing support to these teachers will increase the likelihood that their progress is sustained. Research suggests that while educational innovations are relatively simple to embrace, they are much more difficult to institutionalize. In fact, experience indicates that it often takes three to five years of support and continuing education to ensure that reforms become part of the fabric of the school. "Perhaps the greatest challenge of training lies in recognizing that the need for it never ends. Just as computers and Internet connections require continual upgrades to function at their best, human resources must also be updated to stay current and functional" (Franklin, 2001, p. 5). Continued training and opportunities for sharing beyond the first year of involvement would almost certainly strengthen teachers' efforts.
3. One of the goals of the Teacher Leadership Project is to encourage teacher participants to take on leadership roles, sharing their expertise with colleagues in their schools, districts, and beyond. The extent to which teachers were able to do this during their first year was limited by the enormous amount of time teachers spent learning how to use the technology, how to design lessons, and how to facilitate student use of the computers. As teachers become more skilled, they will have more time to take on leadership roles. Providing a list of local and statewide presentation and publication opportunities may be useful to teachers as they look to expand their leadership efforts.
4. The acquisition of computers and related technology is only the first step in enriching a student's educational experience. Teacher training is critical to the appropriate use of technology, and the Mississippi Teacher Leadership Project provides a sound experience in that regard. Still, student management issues challenged teachers. Providing additional assistance to teachers in managing a technology-rich classroom would certainly be beneficial.

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INTRODUCTION

The Mississippi Teacher Leadership Project is a program designed to assist teachers in their efforts to integrate technology into the curriculum. Funded by the Bill & Melinda Gates Foundation and administered by the Mississippi State Department of Education, the primary goal of the program is to encourage and facilitate teachers in their efforts to provide technology expertise and leadership in and beyond their own schools. During the first year of the project 27 teachers were awarded MSTLP grants, and it is expected that an additional thirty teachers will be selected to participate during the 2003-2004 school year. Data were gathered from several different sources to answer four evaluation questions. Sources included reflective journal responses, classroom observations, teacher interviews, results of a pre-post Technology Use Survey for Teachers and results of a Technology Use Survey for Students.

Description of the Program

The Mississippi Teacher Leadership Project is the result of a funding request made to the Bill & Melinda Gates Foundation by the State Department of Education to continue the technology training begun in 1996 with the TeachNETT program. TeachNETT was designed to “create a human infrastructure of teachers who are familiar with educational technology and their uses in the classroom setting” and to assist those teachers as they “provide leadership to others through modeling, mentoring, and motivating their peers.” Thus it was intended that the MSTLP would continue their efforts to train and support teachers in their use of technology to improve teaching and learning and in sharing their expertise with colleagues.

During the 2002-2003 school year, 27 teachers were selected to participate in the Mississippi Teacher Leadership Project. Funds from the Bill & Melinda Gates Foundation provided training and support for teachers in their efforts to integrate technology into the curriculum, including a five-day summer session (July 2002) and three two-day follow-up sessions during the school year (October, January and April). Instructors from Washington State’s Teacher Leadership Project delivered the training, which was intended to help teachers (1) develop their technical skills; (2) design curriculum that utilized technology and was aligned with state standards; and (3) identify leadership opportunities for sharing their knowledge and skills. Each participant was additionally awarded a grant of up to \$16,500 from federal technology funds to ensure that their classroom was equipped with the required hardware and software. This included a laptop computer, student computers at a ratio of 4:1, a printer, a presentation station, and software to include the Microsoft Office Suite.

Background

The presence of computer technology in K-12 classrooms nationwide continues to grow. For example, it has been estimated that the ratio of students per instructional computer was 3.8 in 2002 compared to 4.2 in 2001. Even more remarkable is the increase in student access to the Internet. In 1998 there were 20 students for every Internet-connected computer while in 2002 that ratio had dropped to 5.6 students per connected computer (Ansell & Park, 2003, p. 43). Furthermore, according to statistics provided by Market Data Retrieval, access to computers is increasing in high poverty and high minority schools. Between 2001 and 2002 the ratio of students to computer decreased from 8.1 to 6.3 in high poverty schools and from 8.5 to 6.7 in high minority schools.

However, as schools dedicate more of their financial resources to technology, questions remain about the impact of this technology on teaching and learning. Larry Cuban, for one, continues to challenge the optimism placed in technology as a means of transforming education.

The question is: with so much money invested in wiring schools, buying hardware, and constantly upgrading software across the country in hope of transforming teaching and learning why are the majority of public school teachers serious home-users but at school infrequent classroom users? Furthermore, when teachers do use technologies in their classrooms, why does their use tend to sustain rather than alter existing teaching practices? (Cuban, 2000, p. 2)

And according to administrators of one school district's technology integration program, "Although teachers now have the advantage of unprecedented access to technology in their classrooms and schools, we find, paradoxically, little evidence to indicate that teachers systematically integrate technology into classroom instruction" (Eastwood, Harmony, & Chamberlain, 1998, p. 1). It has further been suggested that technology, and the Internet in particular, has had relatively little impact on education because educators do not maximize its power. It is too often used for routine tasks and thus "a most powerful and innovative technology [the Internet] is taken and domesticated, or if you want—trivialized, such that it does more or less what its predecessors have done, only it does it a bit faster and a bit nicer . . ." (Solomon, 2002, p. 72). Others share this view. "Computers can motivate students to take more interest in and control of their learning," according to a recent report on technology and learning. On the other hand, "the potential for technology to increase student achievement goes largely untapped" (Allen, 2001, p. 2).

One reason for this may be the limited number of teachers who receive in-depth training in technology integration. Currently, states allocate much of their funding to hardware and software, leaving relatively little for professional development despite the fact that teachers still recognize this as a serious need (Ansell & Parker, 2003, p. 44). According to Meyer (2001) a majority of teachers surveyed indicated they are not given enough time to learn how to use technology as an instructional tool, and a report by the National Center for Education Statistics (NCES) found that only one in three teachers felt

prepared to use the Internet for teaching and learning (NCES, 2000). Similar findings have emerged from a number of evaluation studies: training and time are critical factors in the success of any technology integration program (Brown, Fouts, & Rojan, 2001; Brown & Rojan, 2002; Culp, Shankar, Gersick, & Pederson, 2001; Martin, Gersick, Nudell, & Culp, 2002; Stuen & Fouts, 2000).

The Promise of Technology¹

Developments in the use of educational technology reflect the changes in understanding over the last two decades about how the mind works and how children actually learn. Research derived from work done in developmental psychology, cognitive psychology, linguistics, and neuroscience coupled with the philosophical ideas of constructivism (Duffy & Cunningham, 1996) serves as the basis for many of the current beliefs about what and how children should learn in school.

Our understanding of human learning has...evolved based on a wealth of evidence collected over a wide range of different domains and media from which a process based on the passive assimilation of isolated facts to one in which the learner actively formulates and tests hypotheses about the world, adapting, elaborating, and refining internal models that are often highly procedural in nature. (Shaw & President's Committee of Advisors on Science and Technology, 1998).

The National Research Council's Committee on Developments in the Science of Learning articulated an idea central to this new understanding of human learning: "A fundamental tenet of modern learning theory is that different kinds of learning goals require different approaches to instruction; new goals for education require changes in opportunities to learn. . . . These new learning opportunities should take place in learning environments that are student centered, knowledge centered, assessment centered, and community centered..." (Bransford, et al., p. xvi)

Their conclusions suggest that

- Because many new technologies are interactive, it is now easier to create environments in which students can learn by doing, receive feedback, and continually refine their understanding and build new knowledge.
- Technologies can help people visualize difficult-to-understand concepts, such as differentiating heat from temperature. Students are able to work with visualization and modeling software similar to the tools used in nonschool environments to increase their conceptual understanding and the likelihood of transfer from school to nonschool settings.
- New technologies provide access to a vast array of information, including digital libraries, real-world data for analysis, and connections to other people who

¹ Taken from Fouts, J. T. (2000). *Research on Computers in Education: Past, Present and Future*.

provide information, feedback, and inspiration, all of which can enhance the learning of teachers and administrators as well as students. (Bransford, et al., pp. xviii-xix)

Of particular importance to those involved in the field of educational technology is the potential for computers and related technological tools to be used in transforming the classroom, such that a student's educational experience is qualitatively improved. In the past decade the use of computers has expanded from use primarily as an instructional delivery medium to use as a transformational tool and integral part of the learning environment. In fact, many proponents of the current reform efforts see technology as a vital component of a new educational paradigm in which the curriculum, teaching methods, and student outcomes are reconceptualized (Means, 1994). This view was adopted by the U. S. Department of Education at least as early as 1993. In *Using Technology to Support Education Reform* (United States Department of Education, 1993) it was stated that "technology supports exactly the kinds of changes in content, roles, organizational climate, and affect that are at the heart of the reform movement."

Critical Factors in Technology Integration

As more schools across the country commit themselves to some sort of technology agenda, greater efforts are being made to determine the impact of such technology on teaching and learning. Are computers and related technologies being used to transform student learning? Cuban argues that computers are a mismatch with the requirements and conditions of teaching (Cuban, 1986, 2000), and even those who are convinced that we are "on the verge of the dawn of a golden age for educational technology" suggest that technology has not yet lived up to its promise (Goldberg, 2002, p. 32). Still, clear patterns are emerging that document the benefits of technology-rich environments, including positive changes in student attitude and behavior, classroom dynamics, the role of the teacher, student learning, and student work.

Teacher Training

The benefits of integrating technology into the curriculum are not the result of simply placing large amounts of technology in the classroom. Researchers are discovering a number of conditions that are critical to a sound technology program, and when such conditions are not met the chance of realizing these benefits is greatly reduced. At the heart of a successful technology integration program is teacher training. Researchers, administrators, and teachers have found that training in using computers is essential when attempting to infuse technology into the curriculum. According to Becker,

Teachers who have a reasonable amount of technical skill and who use computers to address their own professional needs use computers in broader and more sophisticated ways with students than teachers who have limited technical skills and no personal investment in using computers themselves. (2000, p. 7)

A review of research conducted by Sivin-Kachala & Bialo documented the benefits of technology in improving student achievement, students' attitudes, and the learning environment. They observed, however, that "The decisions made by well-trained

educators [necessarily] determine the computer's ultimate instructional effectiveness" (1995, p. 17). Other researchers agree.

The focus of integration is on pedagogy—effective practices for teaching and learning. Teachers need to be able to make choices about technology integration without becoming technocentric by placing undue emphasis on the technology for its own sake without connections to learning and the curriculum. For both preservice and inservice professional development, this means providing experiences, primarily in instructional design, media selection, modeling exemplary practices, clinical activities, resource sharing, and extensive and sustained training and practice. (Earle, 2002, p. 10)

In an effort to clarify the importance of effective teaching in technology integration, a study was conducted to determine how teachers at various levels of technology use and teaching abilities actually used computers and related technology (Pierson, 2001). Findings indicated that in addition to possessing technical skills, teachers needed to be knowledgeable of content and pedagogy to maximize the potential of technology. Pierson explained her conclusions as follows:

Researchers (Berliner, 1986; Leinhardt & Greeno, 1986; Shulman, 1986; Wilson, Shulman, & Richert, 1987) agree that expert teachers possess both *content knowledge* and *pedagogical knowledge*, the intersection of which is described as *pedagogical-content knowledge*, or knowledge about specific learning, curriculum, and the various and most useful ways to represent the particular subject matter being taught. The findings of the present study suggest another component to the model, that of *technological knowledge*. This knowledge would include not only basic technology competency but also an understanding of the unique characteristics of particular types of technologies that would lend themselves to particular aspects of the teaching and learning processes. A teacher who effectively integrates technology would be able to draw on extensive content knowledge and pedagogical knowledge, in combination with technological knowledge. The intersection of the three knowledge areas, or *technological-pedagogical-content knowledge* would define effective technology integration. (p. 427)

Pierson goes on to propose that “unless a teacher views technology use as an integral part of the learning process, it will remain a peripheral ancillary to his or her teaching. True integration can only be understood as the intersection of multiple types of teacher knowledge and, therefore, is likely as rare as expertise”² (p. 427).

² “Expertise” or “Exemplary teaching” is defined by Pierson based on a framework from Berliner (1994): “Identifies seasoned teachers who possess the intuition to recognize patterns across unrelated activities and have contingency plans for the unexpected. Exemplary also describes those few highly motivated learners who interpret their environment in fluid, almost subconscious ways and act in anticipation of what is needed”.

Time and Support

While teacher training is clearly one of the most important elements in technology integration, other conditions have been identified as well. Time for teachers to collaborate and plan, adequate technical and administrative support, and access to hardware, software, and funding are essential to a sound technology plan. The importance of time cannot be overstated. It has been reported that “82% of teachers said they were not given enough time outside their regular teaching duties to learn, practice, or plan how to use the computers and other technologies” (Meyer, 2001, p. 50). In a study of laptop classrooms, Windschitl and Sahl found that one of the most powerful ways in which teachers increased their proficiency in using technology for teaching and learning was through regular collaboration with their peers (2002, p. 202).

The importance of adequate hardware and technical support is becoming clear as well. When schools do not make provisions for maintaining and replacing technology, the promise of long-term success is greatly reduced. According to those involved with one district’s technology integration program:

It is not surprising that only about five percent of instructional technology programs succeed or endure beyond a three-to-five year period. Several factors erode efforts a district might make to sustain an effective technology program: a focus on hardware rather than on processes, the recurring obsolescence of hardware, a weak planning process that fails to meet the needs of teaching and learning, little or no staff development, and no long-range plan for sustained effort. (Eastwood, Harmony, & Chamberlain, 1998, p. 1)

It has been suggested, in fact, that the hardware itself is a barrier to true transformation.

To have a truly transformational impact on education, technology must become ubiquitous. It must be always available, mobile, and flexible. It must be intuitive, reliable, and user-friendly to the point of being no more difficult to operate than a chalkboard, textbook, or overhead projector. It must be seamless and nearly invisible. At the moment, educational technology isn’t any of these things” (Goldberg, 2002, p. 32).

Summary

While many believe that progress is being made in the effective integration of technology into the classroom, there is general agreement among educators and researchers that such efforts are still in their infancy. As Goldberg noted in a discussion of the future of educational technology:

It may take a few more years for attitudes and technologies to mature to the point that the transformation is possible- but it will happen. Ubiquitous technology will have such an explosive impact on education that its results will become clearly visible to the naked eye, in stark contrast to today’s inconclusive empirical studies. (2002, p. 34)

And in response to Larry Cuban's contention that computers will play a minor role in changing student learning, Becker acknowledges that

. . . in a certain sense Cuban is correct – computers have *not* transformed the teaching practices of a majority of teachers, particularly teachers of secondary academic subjects. However, under the right conditions – where teachers are personally comfortable and at least moderately skilled in using computers themselves, where the school's daily class schedule permits allocating time for students to use computers as part of class assignments, where enough equipment is available and convenient to permit computer activities to flow seamlessly alongside other learning tasks, and where teachers' personal philosophies support a student-centered, constructivist pedagogy that incorporates collaborative projects defined partly by student interest – computers are clearly becoming a valuable and well-functioning tool. (Becker, 2000, p. 29)

Research on educational technology, including qualitative studies, anecdotal reports, program evaluations, and a limited number of relevant quantitative studies, suggests that there are benefits when technology is integrated into the curriculum. Students' attitudes, work products, and learning, as well as classroom dynamics and the role of the teacher are changed when technology is infused into the teaching and learning process (Brown, Fouts, & Rojan, 2001; Fouts & Stuen, 1997, 1999; Stuen & Fouts, 2000; Tiene & Luft, 2001-2002). On the other hand, there is mounting evidence of certain critical conditions that must be met for technology to be successfully integrated into the curriculum (Becker, 2000; Earle, 2002; Eastwood, Harmony, & Chamberlain, 1998; Solomon, 2002). These include teacher training, time to collaborate and plan, administrative and technical support, and specific hardware and software applications. The Mississippi Teacher Leadership Project was designed to train and support teachers in Mississippi to use technology for the transformation of student learning. The degree to which the program is effective can be measured in part by the degree to which they successfully address these conditions. The evaluation of the MSTLP is intended to assess their efforts in this regard.

EVALUATION DESIGN

Evaluation Questions

The first year evaluation of the Mississippi Teacher Leadership Project focused on the following four research questions:

1. Are the teachers integrating and using the technology in the classrooms as intended?
2. What challenges and/or successes have the Mississippi teachers experienced?
3. What effect has the training had on the teaching and the classroom?
4. What leadership activities have the teachers performed during the year?

Data Sources

Data were gathered from several sources to answer the evaluation questions, including teachers' reflective journals, classroom observations, teacher interviews, a pre-post Technology Use Survey for Teachers, and a Technology Use Survey for Students. Brief descriptions of each are provided.

Teacher Reflective Journals

Twice during their first year in the program teachers submitted journals in which they reflected on their technology integration efforts. Twenty-three teachers submitted January journals and 15 submitted May journals. Teachers were asked to respond to the following specific questions:

Questions for Journal 1 (January 2003)

1. How have you integrated technology into the curriculum so far this year? *(Consider subject areas, projects or units of study, programs and applications)*
2. What has been the response from students, parents, colleagues, and/or administrators to your technology integration efforts?
3. What has gone well in your integration efforts? *(Consider specific projects and activities, student reaction and participations, support, etc)*
4. What challenges have you faced? *(Consider technical issues, time and space issues, student management, support, etc)*
5. What aspects of your MSTLP training have been most helpful as you've integrated technology into the curriculum? What additional training would be useful?

Questions for Journal 2 (May 2003)

1. Please briefly describe any lessons or projects you've done since your last journal that were particularly successful.
2. What challenges have you faced since your last journal response? (*Consider technical issues, time and space issues, student management, support, etc.*)
3. In what, if any, leadership or sharing activities have you and/or your students been involved? (*Consider presentations, demonstrations, classes taught, committee membership, etc.*)
4. What evidence, if any, do you have that suggests students are learning differently and/or more because of the addition of technology to the curriculum; that is, how is their educational experience better because of their access to technology?
5. Has your teaching and/or your classroom changed because of your participation in MSTLP? If so, how?
6. Has your school or your school district changed because of your participation in MSTLP? If so, how?
7. What further training would be useful as you move ahead with your technology integration efforts next year?

Classroom Visits and Teacher Interviews

In order to better understand the integration process, including teacher and student use of the technology, visits were made to three MSTLP classrooms in April 2003. Both teachers and students were asked to share their perceptions of educational technology and the impact it has on teaching and learning.

Technology Use Survey for Teachers

All MSTLP teachers were asked to complete a Technology Use Survey during their summer training session and again at their spring follow-up training. The survey was designed to assess teacher attitudes, use, and expertise related to educational technology. Return rate for both pre and post versions of the survey was 100%.

Technology Use Survey for Students

In the spring of 2003, ten MSTLP teachers were asked to have their students complete a student version of the Technology Use Survey. Of the 222 surveys that were completed and returned, 25 were discarded due to irregular response patterns. This left a total of 197 usable student surveys.

RESULTS

A total of twenty-seven teachers received MSTLP grants and attended the summer 2002 training in Jackson. By January 2003, twenty-four 4th and 5th grade teachers were still involved in the project. They had an average of 13 years teaching experience and represented 20 schools and 13 school districts from across the state.

Evaluation Question 1: Are Mississippi TLP teachers integrating and using the technology in their classrooms as intended?

Journal responses indicated that Mississippi TLP participants found a variety of ways to use their technology and training in the classroom. Computers and related technology were used most often to support social studies, science, and language arts lessons and least often for math lessons. In social studies, computers were used primarily for gathering information and for preparing Power Point presentations. For example, when students were assigned a report on an American president, a U.S. State, or a famous Mississippian, they would typically gather information from Internet sources, compile the information into a written report, and summarize it in a Power Point presentation.

In addition to Internet research and Power Point presentations, teachers had students use the computers to complete Webquests (the 13 colonies, for example), for word processing (book reviews, poems, letters, and stories), and for practicing various skills (math facts, as an example). Skill development activities were accomplished with subject-specific software or with interactive websites such as coolmath.com. Several teachers used the computers for Accelerated Reader testing as well.

The following examples from teachers' journals illustrate a few of the ways in which teachers supported student learning with technology.

- *After reading about how laws may possibly be changed in regards to the dolphin safe label and an essay contest sponsored by Defenders of Wildlife, my students took on a special assignment. They researched current methods of fishing for tuna, the dolphin-safe label, and what were the current considerations for changes in laws affecting these. Each of my students in fifth grade wrote an essay in the form of a letter to President Bush regarding this matter, typing them and an accompanying title page using Microsoft Word.*
- *My students researched various topics including a number of questions I gave them in regards to the killer whale and the solar system, including the sun, planets, comets, and stars; and electricity.*

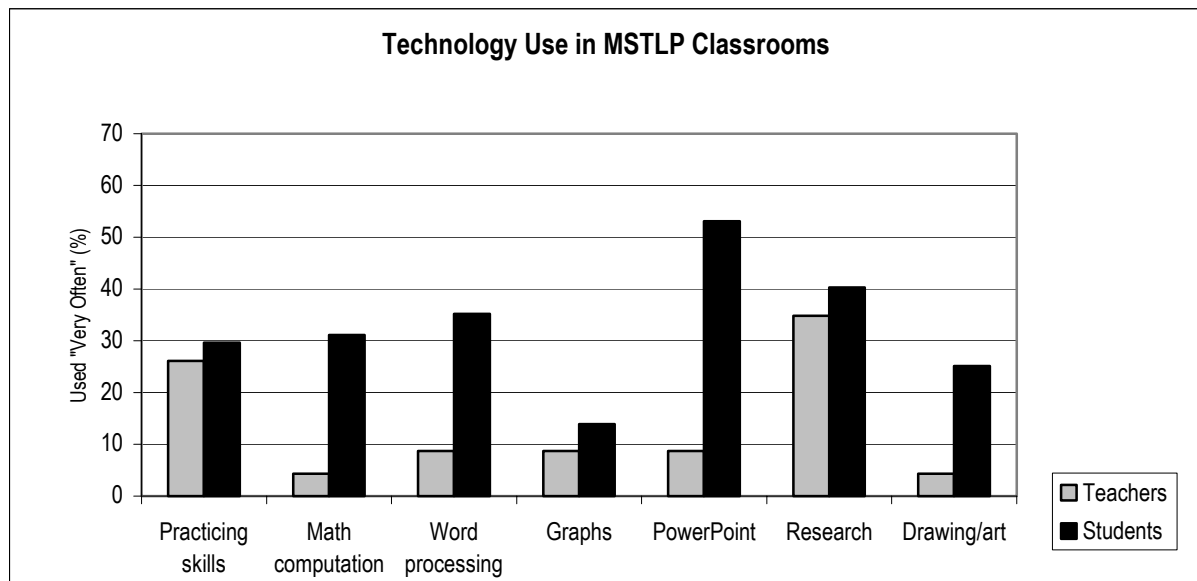
- *Students practiced various skills as needed to prepare for our achievement in the spring, including math practice, editing, writing, and grammar practice, etc.*
- *Students constantly have many questions as we study various subjects in science. They have learned to go to the computer and internet and to find answers to their questions.*
- *I have integrated technology into the Reading and Language curriculum. In reading, my students have learned how to put a book report together using PowerPoint. The books reports allow the students to practice summarizing books which they have read from the Library. As part of the book report, the students must identify certain story elements. I set up a book report template which gives the students specific directions for setting up their report. Language is incorporated in this activity. The students must proofread their work on the slides of the presentation for mistakes. We work of building sentences that others viewing the presentation will find interesting. The technology of PowerPoint and the fact that others will be viewing their presentation helps the students to understand why their report must contain interesting sentences with no mistakes.*
- *Every student in my class produced a PowerPoint presentation on a famous person in history or science. They read a biography and searched the internet for information. They also created time-lines in the presentation. They presented these in class to the principal and to me. Some students used their presentations as a book-share in reading.*

Teachers also used the technology as an instructional tool. This included presenting lessons with Power Point, using projection devices to demonstrate skills and directions, and sharing Internet resources. They found that students were more inclined to pay attention and to process the information when it was presented with the aide of technology. Furthermore, teachers themselves found that lesson planning and even teaching was more interesting when they had access to various technology options.

- *I have started with myself. I want the students to see that technology can be fun and that I enjoy incorporating it into the curriculum. I have made several PowerPoint presentations. I made PowerPoint presentations on the following: "The Solar System", "The States of the Southeast", "Where I Live", and "Action Verbs". I used the Solar System to give information. I used Where I Live as a review game. I used the "States of the Southeast" to teach recognition of the states and their capitals . . . I used action verbs to introduce action verbs and to give a clear understanding . . . I used Encarta to teach continents, scale, and the physical appearance of the moon.*
- *I created PowerPoint presentations for every geometry skill. I used these lessons to introduce objectives and to review them. The visual effects were great.*

Results of the Technology Use Survey supported much of what teachers reported in their journals (Figure 1). Computers were used most often for student research and for skill development, according to teachers, and were used least often for math computation, drawing, and art tasks. Student perceptions of technology use were somewhat different, specifically regarding the frequency of use. For example, just over half of the students surveyed (53.1%) reported that they used Power Point “very often” compared to only 8.7% of teachers. Similar discrepancies in teacher and students perceptions were found regarding the frequency with which they utilized computers for word processing, math computation, drawing, and art. Regardless of these discrepancies, student responses indicated that they used computers most often for skill development and Power Point presentations, and least often for constructing graphs.

Figure 1



Over the course of the year there was an increase in teachers’ use of technology to support teaching and learning in different subject areas. For example, the use of computers and related technology in social studies increased almost 22% during the year, while there was a 20% increase in science and a 15% increase in language arts. Conversely, there was only a 1.4% increase in the area of math (Table 1). These findings are not particularly surprising. Elementary teachers are generally more comfortable focusing their beginning integration efforts on social studies and language arts lessons (Internet research, Power Point, and word processing), while math is often the most challenging subject to integrate.

Table 1. Changes in Technology Use

Increase in Use of Technology (%)	
Science	+29.3%
Social studies	+21.9%
Language arts	+15.8%
Math	+1.4%

Summary

Are Mississippi teachers using the technology as intended? It appears that after their first full year of training they are indeed making progress in using technology to support teaching and learning. Although teachers' efforts were influenced by a number of variables, including level of experience, administrative and technical support, and availability of functional hardware and appropriate software, evidence from journals, surveys, and observations suggests that teachers did find ways to provide students with meaningful technology-enhanced learning experiences. Some teachers were more comfortable using computers primarily for skill development (practicing math facts, for example), while for others technology became an essential tool to support the learning process. This is consistent with other research on teachers' beginning efforts with technology integration. A growing body of evidence on the process of technology integration suggests that it often takes several years for a teacher to develop the expertise and skills to maximize the potential of technology. As noted in a report on the Intel© Teach to the Future program, "Teachers first have to become comfortable with technology by using it to teach in ways that are already familiar to them. Only then can teachers begin to think critically about new learning opportunities that technology might provide their students" (Martin, Gersick, Nudell, & Culp, 2002, p. 10). This being the case, it would be unrealistic to expect a majority of Mississippi TLP teachers to transform their instructional practices over the course of one year. The fact is that they were well-intentioned in their efforts to use the technology to strengthen their teaching and to improve student learning. While there was a tendency among these teachers to integrate technology into traditional lessons plans and projects, it is likely that as they become more experienced in using computers to support teaching and learning their efforts will become more complex.

Evaluation Question 2: What successes and challenges have the Mississippi teachers experienced?

Mississippi teachers and their students experienced many successes and many challenges during the year, according to journal responses. Specific curriculum lessons and projects, student and parent reactions, and personal and professional growth were among the positive outcomes shared by teachers. On the other hand, time pressures,

technical glitches, and student management issues proved frustrating and challenging to teachers.

Successes

Teachers were particularly pleased with students' efforts to use the Internet for information access, and to use that information in reports and Power Point presentations. Jeopardy-type activities were useful in helping students review for tests, and a number of teachers were convinced that students' reading skills were improved when they had access to the Accelerated Reader program. And not surprisingly there was agreement among teachers that students were developing necessary technical skills that will be critical to them as they enter the world of work. Comments from teacher journals reflected these sentiments.

- *My students completed a research project about endangered species that was very successful. We were studying this in Science and also reading stories about animals in Reading. I provided a list of some endangered species but did not limit their choice to the list. The students worked in small groups (5 to a group) usually two days a week. I gave the students certain things I wanted them to find out, such as habitat, scientific name, reasons for endangerment, steps being taken to protect the species, etc. They were also asked to create a poem/provide a visual. The students decided how to divide up the responsibilities. I was impressed with the way the groups worked. The students used reference sources and the Internet for their research. They were very enthusiastic. Some groups even had parents who became very involved. They were not required to do a Powerpoint presentation, but of course they all did. Their presentations were much better than the last ones. All groups became skilled at transferring pictures from the Internet. They were extremely proud of the finished products. We viewed them all using the AverKey.*
- *I believe the use of the Jeopardy game has gone well. The students love doing this type of review rather than pen and pencil work. I also believe it reaches some of my students that do not do as well when they are doing regular oral and written reviews. The use of Encarta to enrich the text has also gone very well. The illustrations and pictures seem to add so much more interest for the students.*
- *My class did 2 PowerPoint lessons that I believe were beneficial. During the week of Presidents' Day, they were assigned a president. They got on the internet and used the library to research him. Then they created a 3 slide show presentation on his life, presidency, and how he made his mark on today's society. They did the same for a famous Mississippian they chose. I believe it helped them learn facts about people they would not have learned other wise.*

-
- *Their educational experience is better first of all, because they are exposed to technology and will be less apprehensive about using it. I have seen the students' confidence in themselves improve especially when they see that they can produce a great work.*

Challenges

While they reported notable successes, Mississippi teachers faced several challenges in their efforts to integrate technology into the curriculum as well. First and foremost was a lack of time. Results of the survey revealed that 80% of teachers strongly agreed or agreed that they did not have enough time to use the computers. Data gathered from journal reflections indicated that teachers struggled to find time to explore materials, to plan integrated lessons, to teach the required curriculum, and to learn the various software programs as thoroughly as they would like. Furthermore, some teachers found that it took longer for students to complete projects when they used technology, which exacerbated the time problem. And finally, the time needed to prepare students for state testing limited teachers' technology integration efforts. The following excerpts are representative of their concerns.

- *The challenges have been those that one might expect: time and student management. This second semester of the school year seemed to have a day or two out of many of the weeks due to school being out for snow, ice, or flooding conditions in our area. We also prepare and give achievement tests in the spring. Therefore, it was difficult to have time to do anything extra or to develop ways of using technology to teach.*
- *The biggest challenge I face is time. I have to teach reading, spelling, English, social studies, and writing to two classes during the day. It is hard for me to fit all of that in and include computer time. Each student has a day they can get on when they have finished their work. Some students are slow workers, so they don't get on as much. I have to allowed students to carry other work home or work during recess time in order to finish on time.*
- *My challenge has been time. With the end of the year and state testing, all of my TLP stuff kind of got put on the back burner.*
- *. . . annual testing, which occurs in early May, put a substantial strain on time. The statewide criterion referenced test is held as a top priority by school administrators and teachers are expected to spend a great deal of time on review and test preparation. Spending time getting ready for testing took away time that could have been used on lesson incorporating technology.*

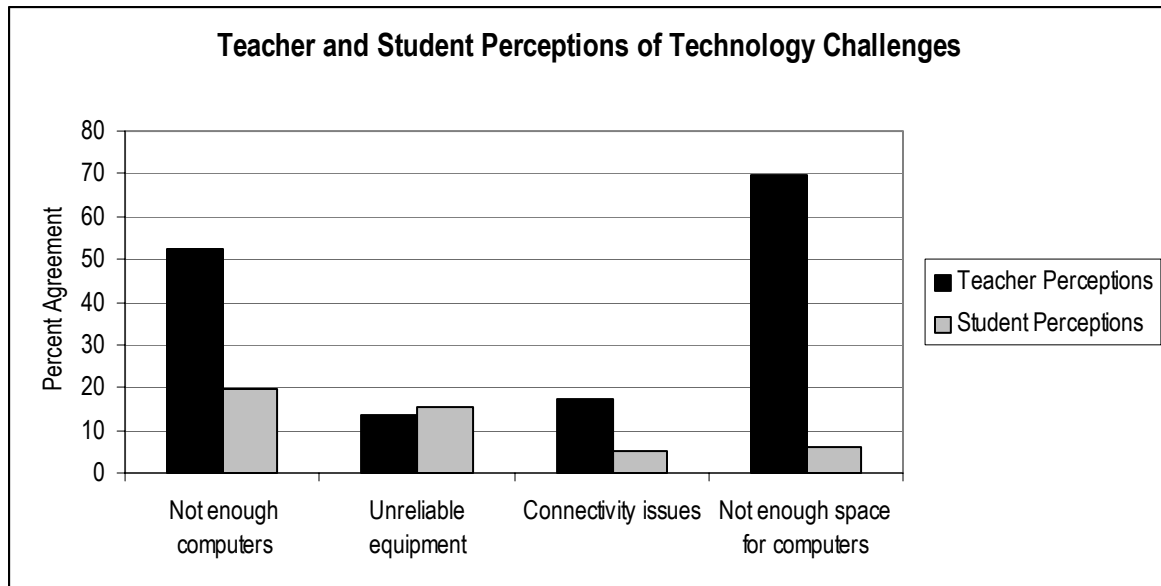
There were also those teachers who struggled with student management. With a limited number of computers in the classroom, teachers found it difficult to provide all students with adequate and equitable computer time. This challenge was compounded by the fact that students often took longer to complete projects on the computers. In some

cases teachers found it easier to take their students to the lab than to try and deal with the 4:1 classroom configuration. In addition to student access, some found it difficult to manage an integrated classroom. While Mississippi TLP participants were beginning to change their teaching practices, including the use of more group projects, few were ready to embrace student-centered, constructivist teaching and learning practices on a day-to-day basis. This being the case they sometimes found themselves in the uncomfortable position of single-handedly teaching a lesson to one group, monitoring students on the computers, solving technical glitches, and responding to any other situations that might arise. Teaching an integrated curriculum requires at least some degree of pedagogical shift and depending on a teacher's level of experience with technology, this can be overwhelming in the beginning. Teaching practices do not necessarily change simply because of increased access to computers in the classroom. In the case of the MSTLP, those teachers who were already somewhat comfortable with technology were more likely to have begun this shift and were thus better able to provide challenging learning experiences for their students. As described by one research team, “. . . teachers move through a multi-step process of experimenting with and gradually mastering a series of steps. Technology integration by itself is not synonymous with teaching that enhances student learning” (Martin, Gersick, Nedell, & Culp, 2002, p. 10). Mississippi TLP teachers are themselves at different places in this “multi-step process.”

- *Student management is another big issue. It is extremely difficult to have five children working on the computers while 15 to 18 others are behind you and usually not doing what they are supposed to be doing. In an ideal situation my school would have a computer lab with 20 or 22 workstations where I could talk my class to work on projects. Having the computers in the classroom is very convenient, but management is difficult.*
- *I have problems with student management when I use the computers. I spend more time trying to manage those who are not on the computers. Generally, students will not remain on task independently or within groups for any real length of time. It becomes very challenging keeping students on meaningful tasks when I'm working with five or ten students on the computers.*

Finally, there was some frustration with technical glitches and equipment malfunctions, although these problems were relatively few when compared to the constraints presented by time and student management. As one teacher noted in her journal, “The three new computers are working great. The two older computers keep breaking down or won't connect to the Internet. The tech people are good about fixing them, but sometimes it takes a month or more before they show up.” Nevertheless, results of the survey indicated that technical glitches were not a major concern (Figure 2). On the other hand, teachers saw a need for more computers and for more space to set up the computers. And finally, 39% agreed that they lacked relevant and appropriate software.

Figure 2



Response to Rich Technology Classrooms

Teachers agreed overwhelmingly that their students were excited to have access to computers in the classroom, and they suggested that this excitement had a direct impact on classroom attitude. For example, teachers shared examples of students being more engaged in their learning, more collaborative in their group work, and more self-directed in completing classroom tasks. In addition, students enjoyed using and sharing their skills at home, teaching their parents how to use Power Point or practicing skills on interactive websites. Reactions from their colleagues, on the other hand, were mixed. Some were jealous, some were disinterested, and some “just aren’t ready for this level of involvement yet,” according to one participant. Still, at least a few TLP teachers found that their efforts inspired others to begin experimenting with technology.

- *My students have enjoyed using the technology. I have had only positive comments from my students: “I like this, can we do this again.” “Are we going to do the same thing tomorrow?”*
- *The students love the powerpoint presentations and Jeopardy Game. They are very excited when I am getting ready to use the laptop and boxlight. They seem to pay attention better. There are less outbursts and more on-task students.*
- *Most students love working on the computer whether it is doing research on the internet, developing presentations, or playing educational games.*
- *My parents expressed the level of excitement in the class. Several commented that they enjoyed visiting and said they were learning along with their*

children. My parents also told me they would be back for more. Parents were also pleased with the improvement in their child's work.

- *The parents have made encouraging comments. Some parents have let their students research at home and bring extra material about the subject we are studying.*
- *My colleagues have noticed me doing powerpoint presentations and using the internet with my students. They are very interested and want to me to show them how to use the boxlight. I have shown a couple of teachers how to use the boxlight. They were wanting to show the whole class something on the internet.*

All in all, while Mississippi teachers faced a number of challenges in their technology integration efforts, these were outweighed by the benefits. They were generally pleased with their attempts to design and teach integrated lessons and suggested that the technology had a positive impact on student attitudes and behavior.

Evaluation Question 3: *What effect has the TLP training had on teaching and the classroom?*

Responses from teacher journals and results of the Teacher and Student Technology Use Surveys suggest that the MSTLP training has in fact had an impact on teaching and learning in several different ways. These include changes in the role of the teacher and changes in students' motivation and approach to learning.

Effects of Technology on Teaching

A majority of MSTLP participants believe that teaching in a rich-technology environment influenced their position as instructional leader, and in fact 96% of teachers agreed or strongly agreed that, "Technology integration has changed my role as a teacher." Reflections from their journals provided insight about these changes. As one teacher noted, "My classroom has become much less teacher dominated." Another commented that she used lectures less often, relying more on student projects and group learning lessons. Their reflections are consistent with other research findings. For example, a study of the Ameritech program reported that teachers "spent less time in front of the class and more time working with small groups or individuals" (Tiene & Luft, 2001-2002, p. 3). Furthermore, "It fostered a shift in teaching style from 'sage on the stage' to 'guide on the side,' and in fact one teacher reported spending more time learning with the students than teaching them" (p. 3). The following comments from MSTLP teachers' journals provide evidence of this shift.

- *My students have become self-learners. Instead of depending on me for all the answers, they know they can use technology to learn for themselves.*

- *My classroom has become less teacher dominated and more student involved. I allow the students to find out for themselves instead of telling them the answer.*
- *One of my major concerns was trying to figure out the best way to instruct my students in how to best utilize the different types of software. What I discovered was that all I had to do was show them one or two things and they took it from there, lots of self-teaching and sharing with each other as new things were discovered. It was awesome to watch! I just stood back and facilitated when needed.*
- *My teaching has changed because I now am emphasizing looking for answers and understanding as opposed to memorizing a bunch of facts as I once did in science. I have felt a renewed sense of excitement for teaching. My classroom now looks and feels different.*

Teachers also generally agreed that their lessons were much more interesting and creative when they had access to computers and other technology tools such as projectors and digital cameras. As one teacher shared, “When I am preparing a lesson, I can use a Power Point presentation, I can include pictures and examples from the Internet, I can choose to have students gather and share information . . . there are so many options when you have access to technology.” Survey data indicated that over 80% of both teachers and students agreed or strongly agreed that assignments were more interesting when they involved technology.

- *I am much more excited and creative in the classroom since my participation in the MSTLP. I look for creative, fun and meaningful learning projects for my students to complete. These projects go far beyond anything I would have done without the use of technology and the education I have received.*
- *I find myself looking for the most interesting way to present a lesson. It might involve a PowerPoint presentation, or it might just involve a picture presentation or information on something like the Statue of Liberty.*

Effects of Technology on Learning

Mississippi teachers also noted a number of ways in which technology has had an impact on student learning. Students were more motivated, they say, and were more likely to “take charge” of their learning. One participant observed that “The students became more involved because of technology. They took ownership . . . I think that when students are enthused they learn more.” Beyond that, teachers suggested that when students were engaged in technology projects their collaborative skills were improved, they were more often on-task, and they were more apt to exceed the requirements of an assignment. Several teachers found that students were much less reluctant to do research when they had access to the Internet and various software programs. Finally, there was a general sense that students were more attentive to directions and to teacher-directed

lessons when technology was utilized. The following excerpts from teacher journals are representative of responses received.

- *The students love working on the computer. They also pay better attention when I use PowerPoint presentations.*
- *The students in my room are really open and responsive to using computers. They need no motivation to get them working on a computer . . . They can't wait to learn more.*
- *My students love everything about working with technology. They enjoyed doing the research and especially enjoyed making the PowerPoint slides. Infact they begged to work on it all the time.*
- *The attention span greatly increases when I present a powerpoint presentation. The students can't wait to do research and print material to use. They are very excited when I am getting ready to use the laptop and box light. They seem to pay attention better. There are less outbursts and more on-task students.*
- *The students learn better because the learning is first hand. They discover it. The teacher isn't just preaching facts, the students are discovering facts. They are more engaged in learning because it is fun and exciting. They want to use the computers. They don't actually realize they are learning until asked to recall what they have discovered.*

Results of the survey confirmed teachers' journal reflections. Eighty percent of teachers and 70% of students agreed or strongly agreed that students took more responsibility for their learning in a technology-rich classroom (Tables 2 and 3). Furthermore, 95% of the MSTLP teachers agreed that having access to computers in the classroom improved student motivation and resulted in more on-task behavior. A majority of teachers also agreed that students were more collaborative when they had access to computers.

Although teachers did not have hard evidence to show that students made academic gains when they had access to technology, there was nevertheless a general sense among them that this was the case. Over 90% of Mississippi TLP teachers agreed that "Using computers can improve students' writing skills." A few teachers also suggested that some of their students performed better on tests after participating in jeopardy-type review exercises, although for the most part teachers did not see much difference in test performance. Examples of these and other learning benefits were shared in teachers' journals.

- *When writing on the computer I have noticed that my students pay better attention to what they are saying and how it sounds. Getting students to*

carefully proofread something they have written on paper is very difficult; this seems to be a little easier for them on the computer.

- *Students type their own work on the computers, too. This again allows them to see any errors the software picks up. Students access spell check and grammar functions to edit their work. They really enjoy using technology in creating and revising their work.*
- *It has become very simple for them to do research on the computer. It has helped them to look for the most important information when researching which is very similar to summarizing.*
- *I think using technology as a teaching tool gives the students a clearer understanding. It also captures the attention of the students longer. I used Encarta to teach continents, scale, and the physical appearance of the moon. I have observed that the students are drawn into the teaching when technology is used.*
- *Any subject becomes a hands on experience. I could have never covered all of the presidents or 43 famous Mississippians, but by giving them these assignments and sharing they learned about all of them from their peers.*

Survey results support teachers' journal reflections about the relationship between technology and student learning. For example, all MSTLP teachers (100%) agreed or strongly agreed that "Computers can increase students' higher order thinking skills" and that "Technology integration in my classroom improves student learning." And more than 80% of teachers agreed that their students "showed more creativity when using computers."

There is some evidence that students found this to be true as well. Seventy-two percent of students agreed that "When I use computers and other technology I understand complicated ideas more clearly" and 85% of students indicated that "I learn more" when using computers.

Table 2. Teacher Perceptions of the Impact of Technology on Teaching and Learning

	Strongly Agree	Agree	No Difference
Using computers can improve students' writing skills.	69.6%	26.1%	4.3%
Computers can increase students' higher order thinking skills.	39.1%	60.9%	0%
Technology integration in my classroom improves student learning.	39.1%	60.9%	0%
Technology integration has changed my role as a teacher.	39.1%	56.5%	4.3%
Student motivation is higher.	34.8%	60.9%	4.3%
Students show more creativity when using computers.	30.4%	56.5%	13.0%
Students are more interested in school.	30.4%	52.2%	17.4%
Students are more frequently on task.	21.7%	73.9%	4.3%
Students are more collaborative.	17.4%	65.2%	17.4%
Students are more self-directed in their learning.	13.6%	68.2%	18.2%
Quality of student work is better.	4.3%	65.2%	30.4%
Students are better problem-solvers.	0%	52.2%	43.5%

Table 3. Student Perceptions of the Impact of Technology on Teaching and Learning

When I use computers and other technology...	Strongly Agree	Agree	No Difference
I learn more.	46.2%	39.0%	10.3%
The assignments are more interesting.	46.4%	35.2%	7.7%
I like doing schoolwork better.	39.3%	29.6%	8.2%
My schoolwork looks better.	41.5%	35.9%	16.4%
I am more responsible for my own learning.	39.6%	32.0%	20.8%
My work is more accurate.	37.1%	37.6%	18.8%
I get to work with other students more often.	27.9%	31.5%	18.3%
I can finish my work faster.	31.0%	30.5%	18.8%
I understand complicated ideas more clearly.	21.7%	73.9%	4.3%
I am a better problem solver.	17.4%	65.2%	17.4%

Teachers reported that at the end of their first year of technology integration, some aspects of the classroom remained relatively unchanged (Table 4). For example, they did not find student behavior to be noticeably changed because of the technology. Data showed that although 43% agreed that they experienced fewer discipline problems during the year, 52.2% suggested the technology made no difference in discipline issues. Similarly, a majority of teachers indicated that access to technology made no difference in the amount of homework students completed (78.3%), in parent involvement in their child's education (73.9%), or in students' test scores (73.9%). And while 50% of the teachers agreed that "It would be difficult to accomplish my learning objectives and goals without the technology," 27.3% disagreed with this statement and another 22.7% were unsure if this was true.

Table 4. Additional Teacher Perceptions of the Impact of Technology

	Strongly Agree	Agree	No Difference	Disagree
There are fewer discipline problems.	13.0%	30.4%	52.2%	4.3%
Students complete more homework.	4.3%	17.4%	78.3%	0
Parents are more involved in their child's learning.	4.3%	17.4%	73.9%	4.3%
Scores on traditional tests are higher.	4.3%	21.7%	73.9%	0
More time is available to help individual students.	18.2%	27.3%	36.4%	18.2%
It would be difficult to accomplish my objectives and goals without technology.	18.2%	31.8%	22.7%	27.3%
It takes a lot of time to use computers for teaching and learning.	30.4%	47.8%	0	21.7%
There are fewer discipline problems.	13.0%	30.4%	52.2%	4.3%

Additional Changes

A comparison of pre-post survey results revealed several other changes that took place in MSTLP classrooms. For example, group projects, cooperative learning groups, performance assessments, and integrated curriculum were all used with greater frequency over the course of the school year when teachers and students had access to technology (Table 5).

Table 5. Change in Classroom Practice

Classroom Practices	Change in Frequency of Use (%)
Cooperative learning groups	+23.2%
Integrated curriculum	+13.9%
Teaming with another teacher	+11.3%
Performance assessments	+11.3%
Group projects	+8.9%
Individualized instruction	-7.4%

Summary

The impact of the Mississippi Teacher Leadership Project on teaching and learning and on the classroom was positive, according to a majority of MSTLP participants. Teachers found that their students were more motivated to learn when technology was present, and there was also evidence that students were more collaborative, more self-directed, more often on task. And while teachers were cautious in suggesting that technology led to higher achievement, they did share the general opinion that students were academically richer because of their exposure to technology. The fact that students had anytime access to current information through the Internet was powerful, according to teachers, and encouraged them in their research efforts. Teachers were also convinced that students were being better prepared for the “real world” in becoming skilled users of technology.

Evaluation Question 4: *What leadership activities have the teachers performed during the year?*

Mississippi TLP participants were most likely to provide leadership by offering technical assistance and informal instruction to their building colleagues. For example, it was not unusual for a TLP participant’s class to share their Power Point presentations with other classes in the building or for TLP teachers to help their grade-level colleagues learn to use the Internet for student research assignments. Teachers also shared academic websites and other curricular resources with interested colleagues. In addition, TLP teachers (and in some cases students as well) provided technical assistance in their building, and there was some level of teacher participation on building and district technology planning committees (Table 6). Several teachers also recruited participants for the next round of TLP training. On the other hand, it was relatively rare for teachers to offer formal classes, in-services, or presentations outside of their own buildings.

Table 6. MSTLP Leadership Activities

	Teacher Involvement
Technical support in building/district	40.7%
School/district technology committee	22.2%
After school classes/clubs	18.5%
Building classes/In-services	14.8%
District classes/In-services	14.8%

The following journal reflections give insight into the various ways in which MSTLP teachers and their students were able to share their technology knowledge and skills with others.

- *A teacher who is not comfortable working with computers comes to me frequently for help. I help her with the things I know how to do. She has also seen me working with the students on PPT and asked me to teach her how to use it. I've only had two opportunities to work with her since we don't have our conference periods at the same time.*
- *Several of my students have become peer helpers. I teach them and then they show everyone else. Also, I have joined the District Technology Committee.*
- *I ended up helping many of teachers in my faculty with their computer questions and sharing ideas with them for use with the classroom. A couple of teachers in my area began taking courses towards a Masters degree in January. I helped them to research various topics and to develop PowerPoint presentations to present in their college classes. Twice I went with them to their night class and was the clicker as they were afraid of not being able to get the presentation to run on the laptop and presentation device properly. I also helped them present one of these on Inclusion at one of our faculty meetings.*
- *Students did powerpoint presentations at PTA meetings to demonstrate their use of computers and to state their opinion on school policy.*
- *The students wanted to share their presentations with anyone who came in the door. My principal's son was in my class, and she would come in to see the progress being made. She brought the interim superintendent in right before school was out. We also shared presentations with several teachers.*

The relatively limited degree to which MSTLP teachers assumed leadership responsibilities is understandable. Research on technology training programs suggests

that teachers' initial efforts to integrate the computers and related technology into the curriculum are intense and leave little time for additional responsibilities. For many teachers this changes during the second year and beyond as they become more proficient and their integration efforts become more natural. This may well be the case for Mississippi teachers.

CONCLUSIONS AND RECOMMENDATIONS

The Mississippi Teacher Leadership Project, funded by the Bill & Melinda Gates Foundation and administered by the Mississippi State Department of Education, provided training to 27 teachers during the 2002-2003 school year to further their efforts in integrating technology into the curriculum. The program was intended to train and encourage teachers in the appropriate use of technology to support teaching and learning. The evaluation of the MSTLP was designed to determine the extent to which these goals were met. Data from teacher's reflective journals, classroom observations, and teacher and student surveys were used to address four evaluation questions.

Findings revealed that the Mississippi Teacher Leadership Project offered teachers a sound, practical training program to assist them in using educational technology in the classroom. The structure and content of the MSTLP is consistent with many of the conditions identified in research literature as being critical to successful integration. These include in-depth and ongoing training, hands-on learning experiences, and a focus on curriculum design and integration. Teachers were enthusiastic about the training sessions and particularly about the expertise of the trainers. Once back in their classrooms, the MSTLP teachers were challenged, yet confident, as they began their efforts to use technology to support teaching and learning.

Their integration efforts resulted in several important outcomes. First, teachers reported that they were both more deliberate and more creative in planning lessons. Their classrooms tended to be more student-centered, and in implementing technology projects they were more likely to facilitate student learning rather than to direct it. Teachers suggested several benefits to students as well. Motivation, on-task behavior, self-directed learning, and collaboration all increased for students in technology-rich classrooms. Students themselves reported being more interested in their school assignments and felt that they took more responsibility for their own learning. And while there was little hard evidence that student achievement increased in MSTLP classrooms, there was a general sense among participants that when students were more engaged in their tasks, they were learning more.

Mississippi teachers experienced several challenges during the year beginning with the late arrival of their computers and software. As the year progressed and they were able to use their equipment consistently, their efforts were compromised by a lack of time to explore programs and plan lessons, as well as technical glitches and student management issues. Still, they remained positive about the benefits of technology for improving teaching and learning and believed the successes outweighed the challenges.

A goal of the Mississippi Teacher Leadership Project is to support and encourage teachers to share their training and expertise with their colleagues, and results of this evaluation suggest that this goal was realized to some extent. Most of the MSTLP teachers provided technical support and advice at the building level, and many of them

offered informal training in the use of Power Point and the Internet for research. Students were part of this collaboration, often sharing their Power Point presentations with other classes across the school. Several teachers participated in school or district technology planning committees, and some teachers recruited colleagues to participate in the next round of MSTLP training.

Mississippi teachers made important progress in their beginning efforts to integrate technology into the curriculum. Some teachers were most comfortable using the technology to teach the curriculum in fairly traditional ways, while those with more computer experience were able to design lessons that maximized the power of the technology. The range of their implementation efforts is consistent with research findings on the process of technology integration, which suggests that there is “no quick path to fully mature teaching with technology” (Martin, Gersick, Nudell, & Culp, 2002, p. 10). While most MSTLP teachers will continue to develop their technical skills over the next several years, both teacher and students found first-year benefits to having access to technology in the classroom.

Recommendations

1. The Mississippi Teacher Leadership Project, based on Washington’s Teacher Leadership Project, is a strong professional development model and provided 27 Mississippi teachers with a sound foundation in technology integration. The focus on curriculum, the expertise of the instructors, and the follow-up training sessions are key to the program’s success. It is highly recommended that the program continue to emphasize curriculum design and to provide numerous opportunities for teachers to share their questions and accomplishments.
2. The Mississippi State Department of Education did a commendable job of administering the Mississippi Teacher Leadership Project, providing the support and resources necessary to facilitate a positive experience for teachers and trainers. It is expected that this level of support will continue as a new cohort of teachers is trained beginning in the summer of 2003. Beyond that, the degree to which they can provide ongoing support to these teachers will increase the likelihood that their progress is sustained. Research suggests that while educational innovations are relatively simple to embrace, they are much more difficult to institutionalize. In fact, experience indicates that it often takes three to five years of support and continuing education to ensure that reforms become part of the fabric of the school. “Perhaps the greatest challenge of training lies in recognizing that the need for it never ends. Just as computers and Internet connections require continual upgrades to function at their best, human resources must also be updated to stay current and functional” (Franklin, 2001, p. 5). Continued training and opportunities for sharing beyond the first year of involvement would almost certainly strengthen teachers’ efforts.
3. One of the goals of the Teacher Leadership Project is to encourage teacher participants to take on leadership roles, sharing their expertise with colleagues in

their schools, districts, and beyond. The extent to which teachers were able to do this during their first year was limited by the enormous time demands of learning how to use the technology, designing lessons, and facilitating student use of the computers. As teachers become more skilled in these areas, they will have more time to take on leadership roles. Providing a list of local and statewide presentation and publication opportunities may be useful to teachers as they look to expand their leadership efforts.

4. The acquisition of computers and related technology is only the first step in enriching a student's educational experience. Teacher training is critical to the appropriate use of technology, and the Mississippi Teacher Leadership Project provides a sound experience in that regard. Still, student management issues challenged teachers. Providing additional assistance to teachers in managing a technology-rich classroom would certainly be beneficial.

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**Appendix A Technology Use Survey for Teachers
(Pre Survey)**

Section 1: General and Demographic Information

Name: _____

Grade Level: _____

Years of Teaching Experience: _____

Years teaching your current grade level: _____

Previous technology training experiences: _____

Section 2: Computer Attitude

Please circle the response that most closely represents your feeling about technology.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. Computers help students learn better.	5	4	3	2	1
2. It is fun to use computers.	5	4	3	2	1
3. Using computers can improve students' writing skills.	5	4	3	2	1
4. It takes a lot of time to use computers for teaching and learning.	5	4	3	2	1
5. Using computers in the classroom makes me apprehensive.	5	4	3	2	1
6. Using computers can develop students' higher order thinking skills.	5	4	3	2	1
7. Computers are boring.	5	4	3	2	1
8. It is difficult to use computers well for teaching and learning.	5	4	3	2	1
9. Computers can increase student learning.	5	4	3	2	1
10. Using computers is an unproductive use of school time.	5	4	3	2	1
11. Students show more creativity when they use computers	5	4	3	2	1

Section 3: Your Use of Technology at School

Please circle the response that most closely matches your school use of technology.

	Never	Occasionally	Once a month	Once a week	Daily
12. Word Processing	1	2	3	4	5
13. E-mail	1	2	3	4	5
14. Internet	1	2	3	4	5
15. Paint or draw software	1	2	3	4	5

16. Graphing/calculation spreadsheet software	1	2	3	4	5
17. Database for organizing information	1	2	3	4	5
18. Video camera	1	2	3	4	5
19. Digital camera	1	2	3	4	5
20. Scanner	1	2	3	4	5
21. Presentation software (Power Point)	1	2	3	4	5
22. Subject specific software	1	2	3	4	5
23. Projector	1	2	3	4	5

Section 4: Technology and Teaching

With which of the following classroom practices and in which curriculum areas did you use technology *during the past school year*?

Please circle the number that most closely matches your response.

	Never Use	Infrequent Use	Moderate Use	Frequent Use	Use most of the time
24. Group Projects	1	2	3	4	5
25. Use of textbooks	1	2	3	4	5
26. Cooperative Learning	1	2	3	4	5
27. Lectures	1	2	3	4	5
28. Individualized instruction	1	2	3	4	5
29. Performance assessment	1	2	3	4	5
30. Integrated curriculum	1	2	3	4	5
31. Independent studies for students	1	2	3	4	5
32. Focus on higher order thinking skills	1	2	3	4	5
33. Heterogeneous grouping for instruction	1	2	3	4	5
34. Homogeneous grouping for instruction	1	2	3	4	5
35. Use of portfolios for student assessment	1	2	3	4	5
36. Teaming with another teacher	1	2	3	4	5
37. Math	1	2	3	4	5
38. Language Arts	1	2	3	4	5
39. Social Studies	1	2	3	4	5
40. Science	1	2	3	4	5

Section 5: Your Technology Skills
Please circle the response that most closely matches your skill in using various technologies.

- 1 = I don't know how to do this
 2 = I can do this but I might need some help
 3 = I can do this on my own
 4 = I could teach others how to do this

	Don't Know How	With Help	Independent Use	Teach Others
41. Use word processing program to create documents.	1	2	3	4
42. Enter and calculate numerical information using spreadsheet.	1	2	3	4
43. Create graphs using spreadsheet program	1	2	3	4
44. Use database to organize information.	1	2	3	4
45. Use paint/draw program to create graphics.	1	2	3	4
46. Use digital camera.	1	2	3	4
47. Use video camera.	1	2	3	4
48. Use scanner.	1	2	3	4
49. Use presentation software (Power Point).	1	2	3	4
50. Use printer.	1	2	3	4
51. Use e-mail.	1	2	3	4
52. Use the Internet for information access.	1	2	3	4
53. Create a web page.	1	2	3	4
54. Install new programs.	1	2	3	4
55. Organize, copy, delete, manage files.	1	2	3	4
56. Use CD ROMs.	1	2	3	4
57. Troubleshoot computer glitches.	1	2	3	4
58. Use subject specific software (Africana, etc.).	1	2	3	4

**Appendix B Technology Use Survey for Teachers
(Post Survey)**

Section 1: General and Demographic Information

Name: _____

Grade Level: _____

Years of Teaching Experience: _____

Years teaching your current grade level: _____

Previous technology training experiences: _____

Section 2: Computer Attitude

Please circle the response that most closely represents your feeling about technology.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. Computers help students learn better.	5	4	3	2	1
2. It is fun to use computers.	5	4	3	2	1
3. Using computers can improve students' writing skills.	5	4	3	2	1
4. It takes a lot of time to use computers for teaching and learning.	5	4	3	2	1
5. Using computers in the classroom makes me apprehensive.	5	4	3	2	1
6. Using computers can develop students' higher order thinking skills.	5	4	3	2	1
7. Computers are boring.	5	4	3	2	1
8. It is difficult to use computers well for teaching and learning.	5	4	3	2	1
9. Computers can increase student learning.	5	4	3	2	1
10. Using computers is an unproductive use of school time.	5	4	3	2	1
11. Students show more creativity when they use computers	5	4	3	2	1

Section 3: Your Use of Technology at School

Please circle the response that most closely matches your school use of technology.

	Never	Occasionally	Once a month	Once a week	Daily
12. Word Processing	1	2	3	4	5
13. E-mail	1	2	3	4	5
14. Internet	1	2	3	4	5
15. Paint or draw software	1	2	3	4	5

16. Graphing/calculation spreadsheet software	1	2	3	4	5
17. Database for organizing information	1	2	3	4	5
18. Video camera	1	2	3	4	5
19. Digital camera	1	2	3	4	5
20. Scanner	1	2	3	4	5
21. Presentation software (Power Point)	1	2	3	4	5
22. Subject specific software	1	2	3	4	5
23. Projector	1	2	3	4	5

Section 4: Technology and Teaching

With which of the following classroom practices and in which curriculum areas did you use technology *during the past school year?*

Please circle the number that most closely matches your response.

	Never Use	Infrequent Use	Moderate Use	Frequent Use	Use most of the time
24. Group Projects	1	2	3	4	5
25. Use of textbooks	1	2	3	4	5
26. Cooperative Learning	1	2	3	4	5
27. Lectures	1	2	3	4	5
28. Individualized instruction	1	2	3	4	5
29. Performance assessment	1	2	3	4	5
30. Integrated curriculum	1	2	3	4	5
31. Independent studies for students	1	2	3	4	5
32. Focus on higher order thinking skills	1	2	3	4	5
33. Heterogeneous grouping for instruction	1	2	3	4	5
34. Homogeneous grouping for instruction	1	2	3	4	5
35. Use of portfolios for student assessment	1	2	3	4	5
36. Teaming with another teacher	1	2	3	4	5
37. Math	1	2	3	4	5
38. Language Arts	1	2	3	4	5
39. Social Studies	1	2	3	4	5
40. Science	1	2	3	4	5

Section 5: Your Technology Skills
Please circle the response that most closely matches your skill in using various technologies.

- 1 = I don't know how to do this
 2 = I can do this but I might need some help
 3 = I can do this on my own
 4 = I could teach others how to do this

	Don't Know How	With Help	Independent Use	Teach Others
41. Use word processing program to create documents.	1	2	3	4
42. Enter and calculate numerical information using spreadsheet.	1	2	3	4
43. Create graphs using spreadsheet program.	1	2	3	4
44. Use database to organize information.	1	2	3	4
45. Use paint/draw program to create graphics.	1	2	3	4
46. Use digital camera.	1	2	3	4
47. Use video camera.	1	2	3	4
48. Use scanner.	1	2	3	4
49. Use presentation software (Power Point).	1	2	3	4
50. Use printer.	1	2	3	4
51. Use e-mail.	1	2	3	4
52. Use the Internet for information access.	1	2	3	4
53. Create a web page.	1	2	3	4
54. Install new programs.	1	2	3	4
55. Organize, copy, delete, manage files.	1	2	3	4
56. Use CD ROMs.	1	2	3	4
57. Troubleshoot computer glitches.	1	2	3	4
58. Use subject specific software (Africana, etc.).	1	2	3	4

Section 6: Support for Technology Use at School

Please mark the response that most closely matches the level of support you receive.

	Not Available	Sometimes Available	Usually Available	Always Available
59. Help with selecting hardware and software.	1	2	3	4
60. Help with set-up, maintenance and repairs.	1	2	3	4
61. Help with troubleshooting glitches.	1	2	3	4

Section 7: Impact of Technology

Please circle the response that most closely identifies the extent to which you believe technology has influenced each of the following elements of teaching, learning, and the classroom environment.

	Strongly Agree	Agree	Unsure/ No difference	Disagree	Strongly Disagree
62. Student attendance is better.	5	4	3	2	1
63. There are fewer discipline problems.	5	4	3	2	1
64. Students complete more homework.	5	4	3	2	1
65. Students are more interested in school.	5	4	3	2	1
66. Quality of student work is better.	5	4	3	2	1
67. Lesson planning is easier.	5	4	3	2	1
68. Student motivation is higher.	5	4	3	2	1
69. Parents are more involved in their child's learning.	5	4	3	2	1
70. Scores on traditional tests are higher.	5	4	3	2	1
71. Students are better problem-solvers.	5	4	3	2	1
72. Students are more collaborative.	5	4	3	2	1
73. Students are more frequently on-task.	5	4	3	2	1
74. Students are more self-directed in their learning.	5	4	3	2	1
75. Management of students is easier.	5	4	3	2	1
76. More time is available to help individual students.	5	4	3	2	1

Section 8: Technology and Instruction
Circle the response that most closely identifies your perception of your integration efforts.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
77. It would be difficult to accomplish my learning objectives and goals without technology.	5	4	3	2	1
78. Technology integration in my classroom improved student learning.	5	4	3	2	1
79. Technology integration has changed my role as a teacher.	5	4	3	2	1
80. Students in my classroom focus on learning, not the technology.	5	4	3	2	1
81. I can easily explain how technology improved or enriches any lesson in which it is used.	5	4	3	2	1
82. Integrating technology into the curriculum is a natural component of my teaching	5	4	3	2	1

Section 9: Student Use of Technology
Mark the response that most closely matches your use of technology.

To what extent do your students use computers for each of the following types of activities?

	Never	Very Little	Moderate Use	Extensive Use
83. Practicing skills (math facts, etc.)	1	2	3	4
84. Solving problems/analyzing data	1	2	3	4
85. Word processing	1	2	3	4
86. Creating graphs	1	2	3	4
87. Presentations and/or demonstrations	1	2	3	4
88. Research using the Internet/CD ROM	1	2	3	4
89. Communication using e-mail or the Internet	1	2	3	4
90. Drawing/artwork	1	2	3	4

Section 10: Challenges
 How much of a problem is each of the following? Please circle the number that most closely matches your response.

	Not a problem	Seldom a problem	Often a problem
91. Not enough computers	3	2	1
92. Not enough time to use computers	3	2	1
93. Not enough room to easily use the computers	3	2	1
94. Unreliable/broken equipment	3	2	1
95. Internet is not easily accessible	3	2	1
96. Not enough relevant/appropriate software	3	2	1

Section 11: Leadership Activities
 Please indicate (X) any / all areas in which you have taken a leadership role since receiving your TeachNETT2 grant.

- 97. Building classes/in-service _____
- 98. District classes/in-service _____
- 99. School board presentations _____
- 100. Community classes/service _____
- 101. After school classes/clubs _____
- 102. Processional conferences _____
- 103. TLP training sessions _____
- 104. Technical support in building/district _____
- 105. School/district technology committee _____
- 106. Other _____

Appendix C Technology Use Survey for Students

Section 1: General and Demographic Information

Your Grade:

3rd

4th

5th

6th

7th

8th

About how often do you use computers at school?

Every day

Once or twice a week

Once or twice a month

Section 2: Mark the response that most closely matches how you feel about using technology at school.

When I use computers and other technology...

Strongly Agree

Agree

No difference

Disagree

Strongly Disagree

1. my schoolwork looks better.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I <i>learn</i> more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I understand complicated ideas more clearly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. school is more interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am more responsible for my own learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I like doing schoolwork better.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I get higher grades on my report card.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I get to work with other students more often.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. the assignments are more interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I am a better problem solver.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I can finish my work faster.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. my work is more accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 3: Mark the response that shows how you use technology at school.
--

How often do you use computers for the following kinds of schoolwork?

	Never	Hardly Ever	Sometimes	Very Often
13. Practicing skills such as math facts or grammar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Solving math problem/analyzing data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Writing stories, book reviews, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Making graphs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Doing Power Point presentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Research using the Internet or CD ROMs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Communicating using e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Drawing/artwork	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How much of a problem is each of the following issues in your classroom?

	Not a problem	Sometimes a problem	Often a problem
22. We don't have enough computers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. We don't have enough room for all the computers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. The computers don't work as well as they should.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. It is hard to connect to the Internet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. I don't know how to use the computers very well.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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