

The Mott Hall School
Case Report from the
U.S.A. Exemplary Technology-Supported Schooling Case Studies Project

The Mott Hall School: A Laptop Pioneer

Ronald E. Anderson & Sara Dexter
Project Co-Directors
University of Minnesota

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For further information on the *U.S.A. Exemplary Technology-Supported Schooling Case Studies Project*, including additional case reports and papers with cross-case analysis, go to <http://www.education.umn.edu/edutech/exemplary>

U.S.A. Exemplary Technology-Supported Schooling Case Studies Project Team Members:

University of Minnesota



Ronald E. Anderson
Sara Dexter
Bobby Jeanpierre
Karen Seashore

SRI International

Carlos Espinoza
Robert Kozma
Christine Korbak
Raymond McGhee

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<p>International Association for the Evaluation of Educational Achievement</p>  <p>IEA's <u>Second International study of Technology in Education (SITES)</u> consists of three modules. SITES Module 2 (M2) is an international qualitative study of innovative pedagogical practices that use information and communication technology (ICT).</p> <p>The final project report and cases from participating countries can be found at http://www.sitesm2.org/</p>	<p>Organisation For Economic Co-Operation and Development</p>  <p>The OECD case studies project, <u>ICT and the Quality of Learning</u>, is a major international initiative organised by the Center for Educational Research and Innovation (<u>CERI</u>) within its work on Schooling for Tomorrow. This initiative is concerned with the profound implications that ICT has for education and learning and involves many of the 30 OECD member countries.</p> <p>The final project report and cases from participating countries can be accessed at http://iol3.uibk.ac.at/ICTandSchooling/caseStudies/</p>
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The Mott Hall School: A Laptop Pioneer

Case Overview

The Mott Hall School is a science, math, and technology magnet school in an impoverished area of New York City. During the 2000-2001 school year when this study was conducted, the school had 425 primarily Hispanic students in grades four through eight, nearly 80 percent of who qualified for free or reduced-price lunch. All of the school's students had laptop computers on a 24 hour, 7-day-a-week basis, which they used throughout the curriculum to support accessing information, and creating products that demonstrated what they had learned about topics under study.

The school began its laptop program in 1996 as a one-classroom pilot in grade five; its success led them to expand the program by grade level increments over a four year time period. The district helped to establish the lease or buy options and a repair process but the school staff members coordinated the curriculum in the computer and content area classes, extended network access to some classrooms, and provided professional development for teachers on the operation of computers and their integration, with some emphasis on project-based and a constructivist model of learning.

The laptops were also an important educational resource in the students' homes. While computers are not used everyday in every class in school, students were nearly always expected to prepare their homework assignments on the computer. School leaders recognized that this laptop was usually the only computer available in most students' homes, and offered educational opportunities to parents about its use.

Implementation Context

History of the Innovation

The pilot project began at The Mott Hall School when in 1995 the district Superintendent went to a meeting at Microsoft in Seattle, Washington. Upon his return, he announced that he wanted a school to participate in Microsoft's Learning Anytime, Anywhere program, which included providing a laptop to every student and teacher in a school. No one in the district volunteered, including, at first, Dr. Miriam Acosta-Sing, The Mott Hall School's principal. Soon after, when talking with a principal of an Australian school with a laptop program Dr. Acosta-Sing realized that her school's computer lab program wasn't providing enough access to students nor at the best time to support instruction and so she selected a Mott Hall teacher and class for a pilot in which a laptop was provided for the teacher and every student:

...she [the Australian principal whose school had a laptop program already] said "Get rid of that paradigm of having a computer lab." And I was like a little taken back, because that was the predominant mode of technology instruction all over the country! ...And then I realized she was right! And so she went on and talked about the laptops and how powerful the laptops were for classroom learning. I said, Why shouldn't we do this? ...We started out with a pilot program of 27 students with a teacher that I felt was really

comfortable, with a teacher who could withstand scrutiny---because everybody was going to be looking at her classroom--and somebody that felt comfortable with computers.

The principal paired this 5th grade teacher with Mr. Salcedo, one of the school's technology teachers, and with some help from other district and school staff established procedures for a leasing and a buy program, orientation for parents, a security agreement, and processes to distribute laptops and to send them in for repair. Mr. Salcedo, who has coordinated the laptop program at Mott Hall since its inception, reported that working out all these details while also teaching full time was very time-consuming and very nearly overwhelming. However, the immediate positive reactions they saw in the students assured them they were on the right track. The success the first year with the one class of fifth graders encouraged them to expand it to all of the sixth grade classes during 1997-98; in the subsequent years, as these students progressed on to the seventh grade, they expanded to that year's fifth and sixth grade classes as well as providing laptops to the entering fourth graders. When eighth grade students received laptops during the 1999-2000 school year, the laptop program was schoolwide. At this point, annually the incoming fourth graders lease or buy laptops, as well as any other students transferring into the school in the upper grades.

School Culture, Professional Community

The Mott Hall School was established in 1986 to provide advanced and rigorous and challenging instructional programs in math, science, and technology. Most of Mott's students are Hispanic and African-American, and the principal and staff's vision for the school is to really inspire and motivate its students to go into the professional fields of math, science, and technology.

From its inception, the school had computer resources and two teachers with full-time assignments to teach computer skills and applications to the students. Originally, all the school's computers were in a lab and students traveled there for their twice-weekly computer class. Early on, an important curricular application for students was to prepare presentation materials for their science fair project, a multi-month project. In the one to two years before they first piloted the laptops, the principal led efforts to move some computers into classrooms, to better integrate them. They also reached out to find a project partner who would help them provide some Internet access at the school, and succeeded in setting up a five-station computer lab with fast Internet access. Success with these classroom and computer resource efforts occurred at the same time the principal asked the staff to begin to implement interdisciplinary curriculum and project-based learning.

The school's computer facilities have always been viewed by the staff as an important resource for the students, in part because for so many students it is their only access to computers. The laptop program increased access to a 1:1 ratio and extended that access into the home. One teacher described how she felt that the laptop program helped to put their students on the "right side" of the digital divide:

I think it's very important that our kids have the laptop. Coming from a very poor community, that they have access to technology is extremely important---that digital divide that they are talking about. They're on the right side of the digital divide, and that's extremely important.

Dr. Acosta-Sing is a strong principal who advocates for particular programs in her building and implements them. While she believes strategic planning is important she is also willing to try new programs that come along if they appear to offer real benefit to children, which is how she felt about the laptop program. Staff members noted that her enthusiasm and openness was encouraging for them to try out new practices surrounding technology integration. They also noted that Dr. Acosta-Sing's support for technology use, in the form of staff development offerings, and public validation of their efforts were important as they took on this innovation. Dr. Acosta-Sing also related that she now sought out professional development opportunities for herself in order to learn more about technology and its potential role in and benefits to instruction. She felt it was extremely important to be able to serve as a model to staff and to learn enough to push the initiative forward.

Based on their regular meetings and discussion of collaborations, it appeared that the teachers at Mott Hall had a fairly strong professional community. There are regularly scheduled all-staff meetings in addition to weekly teaching staff meetings by grade level as well as by department. This allows the teachers to discuss the curriculum and how to work together on it. A math teacher described how through their hard work and coordination they are able to improve the students' learning experiences:

The teachers put in an enormous effort into this program....They just go the whole nine yards: they'll stay after work, they work through their lunch hours. It's a task to be able to do all of these things and to put all these programs together. We're not just teaching to a test in our school. We feel the students have to do well on these tests, but we're always working to do something more creative, we do interdisciplinary projects; we do all kinds of projects with the children to try to make it more interesting in math. We do lots of hands-on activities and discovery types of activities.

The year of our visit, the school had begun to use the services provided by eChalk, a company that sets up and hosts web site for schools. This provided the staff with email accounts and online space for their class, where they could post class activities and other information. A couple of staff members noted that these email accounts allowed them to extend their communication with other staff.

Technology and Technology Support Structure

At The Mott Hall School the students keep their assigned laptops during the four years they are enrolled at the school. At the outset, the lease to own cost was \$70 per month for three years. Through outside funding such as Chapter 1 and grants the district was able to pay for half of this, and the parents had to pay the other \$35 per month. At the time of the visit, the school had implemented another approach to the lease to own program wherein the district purchased the laptops and students paid a \$10 rental fee, which covered the cost of the insurance; however, at the end of three years they did not get to keep the laptops. If a student left the school to attend another in the district with a laptop program, they could keep the same machine. If they transferred out of the district or went to another district school without a laptop program, they had to return the computer to the district.

Each teacher has a laptop as well. In their classrooms teachers also have access to a TV and VCR. In addition, teachers have access to video projectors they could check out from the library. These allowed them to display their computer screen to the whole class in a larger view. The school also had a digital camera.

The school received technical support for the computers at the district level through a “laptop depot,” where students can take their machines if they malfunction. During the entire three-year lease the laptops were under warranty, and maintenance was included for the entire lease cycle. The district had technicians onsite who would try to fix it but if they could not, the warranty allowed for the machine to be sent back to the manufacturer for repair. If the machine was out for more than three weeks, students got a loaner machine. Students were not allowed to load any software onto their machines but any software that came with the machine was covered under warranty and would be reinstalled, if necessary.

There were several staff members who provided instructional support for the operation and integration of technology at Mott Hall. There were three full-time technology teachers at the school. These staff members’ main responsibilities were to teach the technology classes that all the students take twice a week. Several of the teachers to whom we spoke described how they coordinated with the technology teachers so that the computer skills they were being taught were going to soon be applied in the core content area classes. As an additional assignment, the three computer teachers divided up the different technical and administrative duties related to technology at the school. Mr. Salcedo serves as the laptop coordinator; he was a liaison to the district office for the laptops’ checkout and repair and for informing parents about the program. Mr. Munoz was the website administrator and Ms. Thai covered network administration. In addition, their expertise meant that oftentimes they were asked to help troubleshoot computer problems other teachers or students were having.

In addition, during the year we visited, the principal had assigned a teacher half time to the role of “curriculum and technology integration facilitator.” In this capacity the facilitator worked with other teachers on lesson plans and curriculum so as to enrich, extend, and enhance their curriculum by integrating technology.

The school also had a fulltime staff member in the role of staff developer. This role entailed planning the ongoing staff development for the staff as well as working with students in an advisor/advisee role to support their individual needs. He described his activities as revolving “in dozens of different directions that are all related to the particular goals set for the school.”

Even with these personnel willing or assigned to help with instructional support, every teacher we interviewed wished aloud for more opportunities to learn to use and integrate technology. Teachers acknowledged and appreciated the opportunities the school did arrange, but felt they still needed more in order to integrate technology more often into the classroom. One described how it was only through her husband and son donating their time and expertise that allowed she was able to get her entire class of students using the Internet. Another teacher wished for more professional development on applications specific to her content area.

Internet access in the school was a challenge for the staff. At the time of our visit, in the spring of 2001, the building did have a fast connection to the Internet through a technology project at a nearby university. The school benefited from this arrangement in that it was a faster connection than what they would probably have received from the district, and there is no filtering software installed. However, not all classrooms were wired to this connection. Even in classrooms where they had network access, the many Ethernet cables emanating from the router created quite a tangle of cords. In addition, some of the older laptops did not have a network connection in them so the teacher had to distribute to the class PC cards with Ethernet jacks. School leaders told us they hoped to complete extending out network access to all classrooms in the coming year, and were considering wireless access.

While teachers were genuinely pleased overall that students had access to a computer in their home, even when teachers had developed an essential use for them in the classroom, the laptops caused various logistical problems that diminished their satisfaction. For example, the desktops were too small to accommodate other learning materials along with the laptops. The laptop batteries would not last the entire day and their classrooms lacked sufficient outlets for everyone to be plugged in at once---not to mention the tangle of cords that produced. Internet access was seen as an added value the laptops made possible but implementing it was quite a burden for teachers to deal with (i.e. the network cards, routers and the many cables snaking through their classroom). When students' laptops were in for repair and they did not receive a loaner, it kept them from participating in computer-based class activities. In addition, several teachers we interviewed said that more professional development time to allow them to develop additional integrated uses would have made them feel more successful with the laptop program.

Both because of these logistical issues and the particular uses developed for the laptops, it appeared that the laptops were not essential to instruction every day for teachers. Teachers we interviewed indicated that they usually tell their students which days they should have them in class. While some students choose to bring them to class more often, and use them for taking notes, others do not---including forgetting to do so on the days they are asked to have them present. On the two days per week when students attend their computer class, they are to bring the laptop in with them. Outside of the regular school day the laptops are seen as an essential tool for supporting them in their research, study, and homework.

Context Beyond the School

Microsoft's Anytime Anywhere initiative was an inspiration for the laptop program at The Mott Hall School. This initiative was a partnership between Microsoft and Toshiba; it started in 1996 and offered hardware and software price advantages to schools that participated. In addition, a web site Microsoft sponsors allows participating schools or those considering participation to exchange information and classroom resources.

The District Superintendent who initiated the opportunity for a school to participate in the Anytime Anywhere program has since left the district and been replaced by an interim and then another interim acting Superintendent. During the initiating Superintendent's tenure the laptop program grew very quickly. The district website reported that there were 4,500 laptop students

and families in the district in grades four through eight. According to a district staff member in the role of technology facilitator, the program grew quickly and beyond the means of what the district staff could support for repairs and other infrastructure support, such as dealing with parents who defaulted on their leasing agreements. At the time of our visit, there was a moratorium on laptop program expansion in the district. At Mott Hall, however, the staff felt the laptop program was going well.

Improvement in Teaching & Learning

Curriculum and Assessment Aspects of the Improvement

The laptop program itself was not designed as a comprehensive curricular or assessment innovation. Its main goal was to provide students access to computer resources, and when possible, to the Internet. However, at the same time the laptops were being phased in, the school staff was encouraged by the principal to make teaching more interdisciplinary (especially in grades four through six) and employ the use of projects, as a way to get students to become more active in their learning and to construct their understanding of the material under study.

During the week of our visit, we attended an all day staff development session that was held at the school. The topic during the morning was constructivism. The school's staff developer, Mr. Briller, described to the group of teachers about that constructivism was a state of mind, a way of thinking about learning and was not merely a synonym for project work. He passed out some articles to the staff to read about constructivist learning environments. This teacher then described the topic and duration of her "constructivist project" and highlighted how technology was a support to her in its implementation.

The staff recognized ways that the technology tools could support what they were doing. Students could use the tool software programs to create their science fair projects or across the curriculum to support writing. They could use the Internet to participate in the Stock market Game, communicate with experts on a topic under study, or to look up information for research projects and assignments. The integration of the technology into curricular areas was facilitated by cooperation between the technology teachers and the classroom teachers. Staff members reported that in most instances the technology teachers and content area teachers coordinate so software learned in the technology course is relevant to some project or activity underway in a content area class. In math, one day per week is dedicated to using technology to support math teaching and learning.

Teacher Practices and Outcomes

Not all teachers use the laptops in the classroom. Instead, they might count on the students using their laptop to look up information, and prepare documents for homework assignments. For example, many of the teachers we interviewed described how they used web pages on the school's eChalk-hosted site to communicate with parents and students about class assignments and upcoming topics of study.

When teachers planned a “laptop lesson” and wanted all students to bring in their computer to class, they let everyone know a day or two ahead of time. One teacher indicated that the average number of students who would bring in their computers was about 60 percent; another teacher estimated that “nearly all” of her students would bring the laptops when she asked them to. From the examples the teachers described, very often the classroom-based laptop lessons were not just one time uses but rather particular points requiring a computer across the time span of a long term project or activity.

For example, in Ms. Einstein’s sixth grade communication arts class, students followed along with the journey of the Makulu II, the ship of the Reach the World non-profit organization. The organization’s mission was to develop interactive, expedition-based educational resources on the Internet for students and teachers. By following along online, Ms. Einstein’s class was able to trace the journey of the boat, read the weekly ship’s log, and email the crew. She used the boat crew’s exploration of the eastern hemisphere to enhance the class’ study of humanities in that part of the world by developing projects around the boat’s stops and the curriculum.

Ms. Garro, an eighth grade math teacher, used computers in class mainly in support of her classes’ participation in the Stock Market Game. The year of our visit marked the second year she had incorporated this into her curriculum. The Stock Market Game gives students a hypothetical fund of \$100,000 dollars to invest in Nasdaq, Amex, and NYSE-listed common stocks. The students were placed in teams and each group received an online stock portfolio. This simulation allowed Ms. Garro to reinforce the math curriculum as students studied how the financial markets worked and researched stocks to buy, managed their budgets, and compared their performance to other teams in their class. She teamed with the eighth grade computer teacher to ensure that the students were proficient in the use of spreadsheets and graphs to support their understanding of what was happening with their portfolio.

In seventh grade science, Ms. Herzog has made use of the Internet in ways she feels has deeply enriched her students’ study of science. She took part in several collaborative online projects sponsored by NASA. Through these, her students were able to interact with NASA scientists. In one instance they did write a question and designed an experiment for the Mir Space Station, uploaded their work, and received feedback from scientists. Through projects like these Ms. Herzog got to know some people at NASA to whom she could email questions that arose in her class. She described how thrilling this was for her and what a benefit it provided to the class:

I remember the first few times I would go in and send a mail and then I would sometimes, when I was online, I would actually get mail back from like important people at NASA. I would say, Oh my god! Oh my god! I can’t believe it! They are talking to this teacher in Harlem!...I had a question or something, I could ask them. You could never, ever before the Internet have an experience like that.

Ms. Herzog also had her students use various software programs such as Excel and PowerPoint to prepare their science fair projects. Such software was also a help to the students as they studied different curriculum topics, such as making graphs that compared the temperature and precipitation of two different biomes.

Other science teachers at the school also found the computers to be a helpful support to teaching and learning. Ms. Rosen, a teacher at both the seventh and eighth grades, used the online version

of the New York Times newspaper in her class to enrich and extend students' study of science. On Tuesdays a section of the paper focuses on science. The students were assigned to read an article within that section and report on it by the end of the week. In addition, Ms. Rosen can choose to use science lesson plans posted at the website, which each noted curriculum standards that are met by the described resources and activities and also provide discussion questions and ideas for interdisciplinary connections. But because she had to move throughout the day to different classrooms, some with Internet drops and some without, she had the students access the New York Times outside of her class; students without Internet access can also work with a hard copy version of the newspaper.

Mr. Haugenbraun, an eighth grade earth science teacher, described how his work with the NASA sponsored Institute on Climate and Planets (ICP) provided him with real data, simulation programs and numerous activities for students in the areas of global warming and the greenhouse effect. This allows him to provide students an opportunity to examine real data, visualize it by organizing it into spreadsheets and graphs, interpret these and then use the information to support their conclusions or to look at problems in a different way. Mr. Haugenbraun indicated that using such applications students used laptops in class on average about once a week.

The eighth grade social studies teacher, Ms. Chinnery, reported that students mostly used computers outside of class time, to complete assignments. She described an exit project for the year on the topic immigration that required that students make graphs and PowerPoint slides to present their findings. She also suggested Internet resources for them to use that contain primary source material. During an interdisciplinary unit called "Moving West" she had students use Oregon Trail, a computer-based simulation that allowed them to plan their wagon party's trip west on the Oregon Trail, including buying supplies, choosing team members, and selecting their route.

In summary, nearly all of the Mott Hall teachers expected the students to use their laptops at home, in support of research and other homework. As indicated by these examples, many of the teachers did find in-class uses for the laptops. The specific uses and the frequency of in-class use varied according to where the technology appeared to the teacher to enhance the curriculum, as well as their tolerance for less than ideal logistical conditions. Choosing to use the laptops in class meant that the teachers had to be willing to manage cramped desktop space, a tangle of cords, and for the Internet, dealing with network cards, routers, and cords.

Student Practices and Outcomes

When students used the computers in class, they usually all had their own laptop on which they worked. Because of limited desktop space and limited numbers of network connections, or if students did not bring their laptops, on occasion pairs of students shared a laptop. In the student focus group, the participants (all seventh and eighth graders who had had a laptop for several years) told us that on average they now carried the laptops into school about two to three days a week. They were sure to bring it on the two days they had computer class, and they usually complied when teachers requested they bring it for a particular use in a content area class. However, they could recall how when they first got their laptop, they were much more eager to carry it back and forth to school and eagerly used it for note-taking. It appeared that the novelty

had now worn off, and that the students viewed their laptop as an essential tool for some purposes but not so important for other class activities.

As implied through the descriptions of different uses for the laptops employed by the teachers, the most common practices for students' laptop use was conducting research and making documents for their homework assignments. In the student focus group, the participants told us that most often they used Microsoft Word, PowerPoint and Excel to produce reports or papers, presentations, and graphs, respectively. Several of the students described how since they had been writing with a word processor for several years now, they really preferred it to writing reports by hand and elaborated on the benefits of cut and paste, double spacing, margin controls, and formatting features. They felt they produced their work more quickly and were more pleased with the end product.

A couple of the focus group students had some Internet access at home, in which case they were able to go online to look up information to complete their assignments. They could access the public library's database of books and request titles be sent to their nearby library branch. Some students had explored other uses for it, like to produce materials for a scrapbook, or make greeting cards. One student described at length the impact on his family that his bringing home a laptop had made. His mother now makes her resume on it; his family got an Internet connection and they purchase things online and communicate with relatives who live far away. At his house they had even given the laptop the nickname Bongo.

Overall the students were very pleased that they were at a laptop school. But when asked at the end of the focus group if they had anything to add, the students quickly listed that they thought their laptops were too old, and needed to be faster and have more operating memory. They also wanted smaller, lighter laptops. Since they were seventh and eighth graders, the laptops they were using were now three to four years old. They did not think it was right that their lease cost was same as the incoming fourth graders who were receiving brand new computers.

The Mott Hall School is a science, math and technology magnet school for gifted and talented students. The students' score very well on the state and city tests relative to their peers. In language arts, a city test is administered to the school's students in grades, five, six and seven; the school's eighth graders take the state test. Results for the number of students meeting, below, or exceeding the standard level of achievement on these tests are compiled for all the community districts in the city and reported. At Mott Hall, in all tested grades in the spring of year 2000 93.3% of the students were either at the standard level of performance or exceeded it. Across the city's school districts, the percentage of students at these two performance levels was 37%. In mathematics, Mott Hall students also did very well in comparison to their peers. The city and state mathematics tests are administered at the same grade levels as the language arts tests. In all tested grades 91.8% of the students met or exceeded the state and city standards; comparatively, only 25.8% of the students in city schools performed at similar levels.

While Mott Hall students performed very well on these tests, the teachers we interviewed did not think that the laptops had directly raised the students' test scores. However, all of the teachers to whom we spoke felt that the technology provided benefits to students. Most often the benefits

were described in terms of minimizing the “digital divide” for their students. According to the principal, the school’s mission was to provide

...advanced and rigorous and challenging instructional programs in math, science, and technology. Because most of our students are Hispanic and African-American, the idea behind The Mott Hall School is to really inspire and motivate them to go into the professional fields of math, science, and technology.

Thus, the teachers viewed the laptops as providing students with access to tools they would be expected to know as they gained post-secondary education and moved on into professional fields. Teachers also mentioned that they thought students found technology as motivating and thought that students felt proud of the products they produced with them. The comments from students in classes we observed and in the focus group supported the teachers’ conclusions.

An external evaluation of the "Anywhere, Anytime" laptop program was sponsored by the New York City Board of Education and conducted by Metis Associates, Inc. The evaluation consisted of three phases: a pilot of one class at Mott Hall during 1996-98; 17 classes across several schools in 1998; and a summer program in 1998. The study evaluated three types of potential outcomes from the laptop program: (1) motivational and cognitive aspects as perceived by teachers, staff, and the students themselves, (2) student attendance, and (3) achievement test performance. Control or comparison classrooms were analyzed in the first two phases for attendance and achievement.

Students in the laptop program at Mott Hall and other schools across the district reported that they found school to be more interesting with the laptops and it helped them work more independently by improving their organizational and writing skills. The teachers said that the laptop program made the students more motivated to learn and more engaged. The evaluation study found that laptop program participation helped to maintain and increase daily attendance, even for Mott Hall students who already had high attendance rates. This impact continued at Mott Hall across three school years. It is safe to conclude that the advantage in student attendance probably came from their improved motivation.

The impact of the laptop program upon achievement in math was more complex. The mathematics test performance of the pilot class at Mott Hall was higher than the control classes for two years after the program was first implemented even though they were about the same level before the program. This pattern was not replicated in second phase for a broader range of classes and student abilities. Two plausible reasons given for this lack of consistency were that the achievement test may not have measured the types of skills that the teachers were emphasizing in conjunction with the laptop activities and secondly, most students required a significant amount of time during the first year to learn the computer skills necessary to be effective with the laptops and their software.

Lessons for the future

Noteworthy Outcomes

With constant access to a computer, students became very proficient at using a variety of programs. There was also high degree of computer literacy among the staff.

In addition, the laptops appeared to be a motivating factor for students, and made a positive impact on student attendance.

With little assistance from their school district, this school's staff members put school wide laptop program together that included a parent education component and a safety program. The school was able to establish 1:1 student to computer access for 100% of the students, who otherwise were unlikely to gain any computer access at all.

Added Value from Technology

The students' and teachers' laptops served as an important aid to them in completing work. Students were able to use programs such as word processors, presentation software, and spreadsheets to work with information and produce homework products. With network access, students were able to use a variety of resources on the Internet to aid them in their research and exploration. Teachers used laptops to search out information to enrich their curriculum, and with projection hardware, present information to students. Several teachers had just begun to use a web site to organize information about their class and make it available at anytime to students and parents.

Teachers and parents were both pleased that the students were developing their technology skills. The laptop access for all students helped this science, math and technology magnet school fulfill its mission to prepare students to go into those areas of study. The staff felt that developing students' technology skills was an important part of that overall preparation.

Key Implementation factors

Key to the laptop program getting underway was the leadership for it from the school principal. She grabbed onto the idea to bring laptops to The Mott Hall School and carefully selected staff to pilot and support it, thereby nurturing its implementation along.

Through extra effort from the staff, the school was able to work through the many logistical challenges of implementing a laptop program. While the school did have three computer teachers who had a strong computer background, they all taught classes full-time and put in extra effort to get the program up and running. Teachers, and in some cases their family members dedicated extra time to configure computers and complete the networking necessary to bring Internet into the school classrooms.

Challenges

While teachers and students alike identified the Internet as a useful instructional resource, providing access to it throughout the school proved to be quite a challenge. Even in classrooms with an Internet connection, getting the laptops configured for network cards, handing out and collecting again the cards each time they use Internet, and the tangle of power cords and Ethernet cables that were required produced a lot of extra work and logistical planning for teachers. At the time of our visit, the school was hoping they would be able to switch to wireless networks in the upcoming year.

Because Mott Hall School housed in a small building, the majority of teachers were not able to teach all day in the same room. For teachers who had to switch rooms once or more during the day, it made the classroom use of the technology more difficult for the teacher, as it meant moving equipment and perhaps adjusting a lesson plan for rooms that had an Internet connection and others that did not.

Occasionally, when a laptop failed, it left the student without a computer for long periods of time. While school staff members were pleased the district provided a laptop repair program, the time delay disrupted the student being able to prepare homework assignments or to have a computer available in class for use. The staff hoped to see improvements in the repair time turn-around.

While the area district superintendent's office did initiate the laptop program and coordinate the repair and leasing services, it does not provide networking or much budgetary assistance. District coordination on these two issues would likely add to the sustainability of the efforts at the school by addressing two areas of concern for the Mott Hall staff.