EARLY EVIDENCE FROM THE FIELD

THE MAINE LEARNING TECHNOLOGY INITIATIVE:

IMPACT ON THE DIGITAL DIVIDE

OCCASIONAL PAPER #2

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Abstract

The Maine Learning Technology Initiative (MLTI) is a statewide program that, according to the Task Force on Maine's Learning Technology Endowment, is intended to:

> "…transform Maine into the premier state for utilizing technology in kindergarten to grade 12 education in order to prepare students for a future economy that will rely heavily on technology and innovation." (Task Force on Maine's Learning Technology Endowment, 2001, p. vi).

One of the strategies Maine is using in preparing youth for the future economy is a statewide program to provide every seventh and eighth grade student and their teachers with laptop computers, and to provide professional development and training for helping teachers integrate them into their classroom instruction. This paper examines the impact that the distribution of laptops to students in Maine is having on students and their learning in relation to the digital divide. Seventh and eighth grade students who had received laptops in the 2002/2003 school year, as well as their teachers were the focus of this evaluation. Data from surveys, case studies, interviews, classroom observations, and document analysis have been examined in order to more closely identify the laptop initiative's impact on student learning. Preliminary findings in this report indicate the beginnings of bridging the digital divide in Maine at least for 7th grade students and teachers as a result of the Maine Learning Technology Initiative.

The Maine Learning Technology Initiative:
Impact on the Digital Divide

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Introduction

This report presents mid-year evidence from the Year One evaluation of the Maine Learning Technology Initiative. The Maine Learning Technology Initiative (MLTI) is a statewide program that, according to the Task Force on Maine's Learning Technology Endowment, is intended to:

> "…transform Maine into the premier state for utilizing technology in kindergarten to grade 12 education in order to prepare students for a future economy that will rely heavily on technology and innovation." (Task Force on Maine's Learning Technology Endowment, 2001, p. vi).

The initiative was established on the premise that technology and innovation will play key roles in Maine's economic future. Nearly 70% of business and information technology (IT) professionals nationwide report that their companies are concerned about the Digital Divide because they, and the U.S. economy in general, need more IT talent. According to the Children's Partnership (2002), by 2010, jobs in the computer and mathematical fields are expected to increase by 67%. However, Maine currently ranks 44th in the United States in the number of high-tech workers. New Hampshire, on the other hand, ranks 28th and Massachusetts ranks 4th. In terms of average high tech wages, Maine ranks 43rd, while New Hampshire and Massachusetts rank 14th and 3rd respectively.

Implementation of the Laptop Program

One of the strategies Maine is using in preparing youth for the future economy is a statewide program to provide every seventh and eighth grade student and their teachers with laptop computers, and to provide professional development and training for helping teachers integrate them into their classroom instruction. A pilot project using this strategy was undertaken in Spring 2002, in which seventh grade students and their teachers in nine Exploration Schools were provided laptops. A program of professional development for teachers that introduced teachers to the laptop and basic computer skills also began during this time and is continuing, with increasingly sophisticated training focused more specifically on teachers' academic content areas. In the fall of the 2002-2003 academic year, the first full implementation phase of the MLTI began. In this current phase, over 17,000 seventh graders and their teachers

in over 240 schools across the state have received laptop computers. Concurrently, the Department of Education has initiated a professional development network consisting of several new roles and regional positions.

Each of the 243 middle schools in the state nominated a Teacher Leader who then received training that would enable them to serve as a leader within their school for the MLTI. These Teacher Leaders now serve as contact and support personnel for the classroom teachers in the buildings where they teach. A second role that has been created is that of Regional Integration Mentors (RIM). A RIM is a teacher within each of the nine superintendent regions in the state who, in addition to their regular teaching responsibilities, assists MLTI staff in the development of a statewide network of professional development related to technology integration in middle schools and within each region.

The most recent roles created in the MLTI professional development network are Content Mentors and Content Leaders. Content Mentors are specialists and statewide leaders in specific content areas; mathematics, science, language arts and social studies. Content Leaders are content specialists within each of the nine superintendent regions. These individuals serve as resources, along with the RIMs and teacher leaders within each region, to help organize, establish, and maintain the MLTI professional development network within each region and the state. These positions have been created to facilitate greater integration of curriculum and technology and as support for the transformation of teaching and learning in Maine's classrooms.

This report presents some early evidence on the effectiveness and impact of the implementation of the Maine Learning Technology Initiative (MTLI) on students and their learning. These findings are the result of work which began in June 2002 when Commissioner J. Duke Albanese, Maine Department of Education, asked the Maine Education Policy Research Institute (MEPRI) to conduct the first year evaluation of MLTI.

MEPRI was created in 1995 by the Maine State Legislature. It is a non-partisan research institute funded jointly by the Maine State Legislature and the University of Maine System. The Institute conducts education policy research for the Legislature, and under grants and contracts, conducts a variety of studies and evaluations on education topics. Each year it publishes a Condition of Maine K-12 Education report, a report which documents changes in over 50 education indicators, and a Legislative District Education Report which describes school systems within each legislative district.

Methods and Procedures

<u>Research Questions</u>

In the area of students and learning, three core long-term questions exist. These questions include:

> *What is the impact on students' skills in acquiring and constructing new knowledge?*
>
> *What is the impact on student achievement?*
>
> *What is the impact on Maine's digital divide?*

Obtaining answers to these core questions will require a multiple-year evaluation. However, preliminary research has focused on determining how, and to what extent, pre-conditions or forerunners for long-range achievements are occurring in the Initiative. In other words, are the laptops being used at this early stage in such a fashion that will lead to greater student learning and achievement in the future? For example, greater engagement in the learning process increases student learning, so one foci of the Year One evaluation is to determine if student engagement has increased with the laptops, and if so, how, and why. To that end, this report will focus on the third core question:

> *What is the impact on Maine's digital divide?*

How can technology help the education and achievement of our children? The CEO Forum School Technology and Readiness Report (2001) provided specific examples of how technology in education can improve student achievement and help children to develop 21st century skills. Technology can help improve student achievement by improving scores on standardized tests; increasing application and production of knowledge for the real world; increasing the ability for students to manage learning; increasing the ability to promote achievement for special needs students; and improving access to information that increases knowledge, inquiry and depth of investigation.

Technology can help develop 21st century skills by improving basic skills (e.g., math, writing); improving digital age literacy skills (e.g., technological, cultural, global awareness); improving inventive thinking skills (e.g., creativity, problem solving, higher order, sound reasoning); improving effective communication and interpersonal skills (e.g., writing, public speaking, teamwork, collaboration); and improving productivity skills (e.g., create high quality products). Therefore, while it is necessary for children to have access to quality education, it is just as important for them to have the technology needed to succeed in the 21st century.

Subsequently, the importance of bridging the digital divide becomes critical in order to provide all the technology tools needed for success to all the students in Maine.

What is the digital divide? The Office for Information Technology Policy defines the digital divide as "disparities/differences based on economic status, gender, race, physical abilities, and geographic location between those who have or do not have: (1) access to information, the Internet, and other information technologies and services, and (2) the skills, knowledge and abilities to use information, the Internet, and other technologies". Therefore it is essential that all children be given the access and skills to use the technologies they will need when they enter the workforce.

A recent study by the Corporation for Public Broadcasting does show a change throughout the country in the digital divide with a major increase in the use of the internet among children regardless of age, income, or ethnicity. In fact, the report, "Connected to the Future" (2003), indicates that 65% of American children between the ages of two to seventeen are now able to use the internet either from school, home, or some other location. This constitutes a 59% growth rate since 2000. However, there is still a significant gap in access to the internet based on income, race and ethnicity, location, and education level in the United States. The Children's Partnership reported that 75% of households earning less than $15,000 per year do not have Internet access, compared to 21% of households earning more then $75,000 per year. Approximately 47% of rural households do not have access to the Internet. And, 87% of adults (age 25+) with less than a high school education, and 60% of adults with only a high school diploma do not use the Internet. In Maine, 37% of households do not own a computer and 47% do not have Internet access. However, 68% of households in Maine earning less than $15,000 per year do not own a computer, and 78% do not use the Internet at home. This clearly illustrates a digital divide related to poverty in Maine.

Data Sources

Because collecting extensive evaluation evidence from all students, teachers, and schools participating in this initiative is cost and time prohibitive, a matrix sampling strategy has been used in the Year One evaluation for identifying different types of middle schools, student populations, educator populations, and communities. This permits different questions to be answered using representative samples. In addition, this strategy minimizes the intrusion of data collection strategies into the operation of schools, and the teaching and learning process. The

eighth graders in the Exploration Schools are also a focus of the Year One evaluation. The purpose of including this group in the sample is to determine the continuing impact of the spring 2002 Exploration School pilot program.

The evaluation plan is using a mixed-methods approach to evaluation. Using multiple evaluation and research methodologies and varied sources of evidence provides a more comprehensive framework for triangulation of evaluation evidence, and increases the validity, reliability and generalizability of findings. *Surveys,* some of which are web-based, are being used as a primary means of gathering data from large samples of students, educators and parents. *Case studies* of representative schools and student groups are being conducted. *Interviews, focus groups, classroom observations and analyses of school level documents, such as memos to parents, school policies, and including analysis of student work,* are essential data collection strategies.   The evaluation team is also attempting to track the impact of the Year One program on student achievement and school level performance. However, more time will be needed to draw reliable conclusions on these aspects of MLTI.

Surveys have been both web-based and mailed. Students were asked to respond to web-based surveys. Teachers received a mailed survey which was also available online. Surveys were designed to collect a breadth of information on the use and impacts of the laptops.

Site visits, interviews, and observations have been designed to provide more in-depth information on specific uses and impacts. Protocols for interviews, and observations conducted during site visits to the 9 Exploration schools and eight additional middle schools, were created and used by the staff of MEPRI to insure consistency in the data collection process.

The information contained in this report is based on an analysis of several data sources, but principally on an analysis of survey results from student and teacher surveys and interviews of students, teachers, principals, and other support staff. Some information has also been taken, where appropriate, from the MLTI website, Maine Learns (www.mainelearns.org), which invites teachers and parents to post success stories related to MLTI.

Results

<u>Preliminary Findings</u>

Why does the digital divide matter to children in Maine?

Studies have shown that the Internet and information technologies are valuable tools for educational advancement. Not only is it clear that students are more engaged and interested in learning when using technology, but it is imperative that they have the knowledge and experience with technology in order to prepare for the workplace where a high school education and basic technology skills are minimum requirements. As stated earlier, one of the laptop initiative goals is to prepare our children for the highly technological workforce, and to that end we need to bridge the digital divide in Maine.

The digital divide in Maine consists mostly of poverty level and regional differences throughout the state. The lower income areas and the more rural areas both have significantly less technological tools at their disposal, thus creating a gap in equity of the quality of education that children in those areas are able to achieve. The laptop initiative can be a major factor in bridging that gap in a number of ways. By providing laptop computers to all 7th and 8th graders in the state of Maine, all children will have equitable access to obtain the education and the skills they will need to succeed in today's workforce.

Maine has always had a disparity between the north and the south, the "two Maine's" as it is called. The 2000 Census has confirmed that a divide still exists between the higher poverty areas to the north and west, and the more affluent areas in the south and east. (See thematic maps in Appendix A) While it may be true that those areas are less populated and have lower socio-economic status than the areas to the south, it does not have to mean that the children are not able to receive the same quality education. With today's technological advancements and networking availability an equity gap within the education of the children of Maine should not exist. The results from the Mid-Year Evaluation of the MLTI confirm that it is possible to bridge that gap and provide equitable access to technology throughout all of the state of Maine.

Will the Maine Learning Technology Initiative help bridge the digital divide in Maine?

The technology provided by the laptops is affecting education by impacting both teachers and students in positive ways. These positive impacts are a clear indication that the technology when provided to all students and teachers can level the playing field for all involved. Not only does this provide the needed technology tools to the higher poverty schools and children, it also

provides the tools needed for the at-risk and special needs children to be able to succeed as well. The impact of the MLTI on the digital divide can be shown by examining how the laptops are being used by students in and out of the classroom, and how using the laptops is affecting their ability to learn.

The early evidence indicates that the Maine Learning Technology Initiative has dramatically increased the use of technology within classrooms. Students have reported using their laptops to research information, complete assignments, create projects, and communicate with teachers and other students. Figure 1 indicates the percentage of students who reported using the laptops at least once a week or more for the following activities. As the students begin to use the laptops more within their classes, they report an increase in interest in their school work and an increase in the amount of work they are doing both in and out of school. The nature of student learning in classrooms may be changing because students have the tools to pursue, organize, analyze and present information more readily at hand.

Figure 1
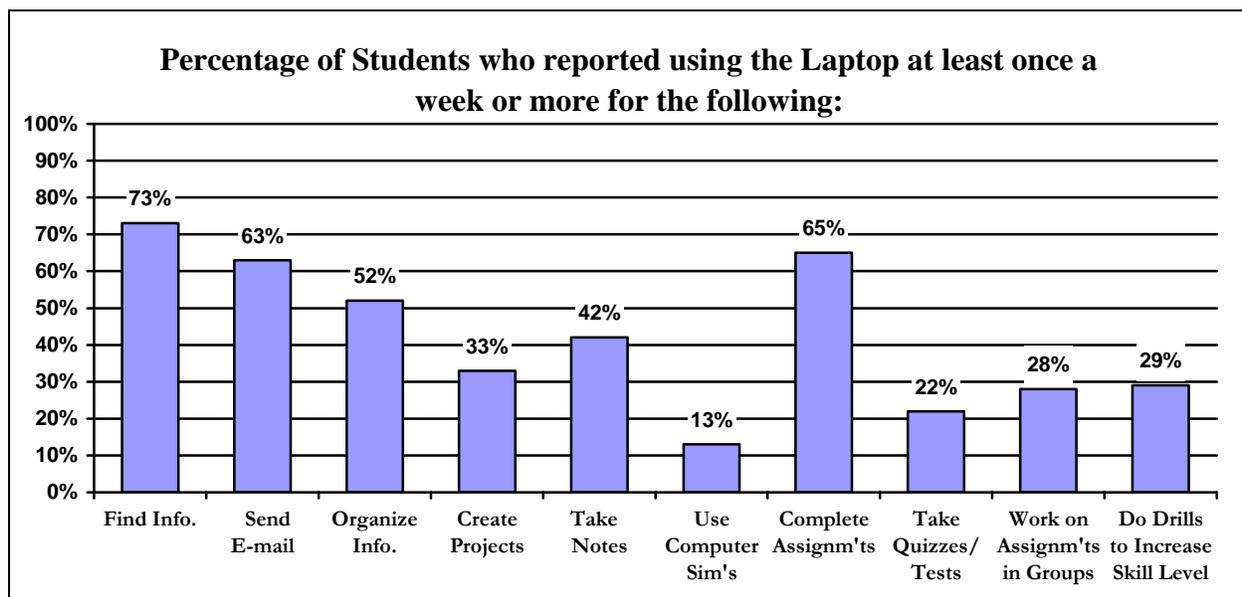
Prior to the laptop initiative, computer access was limited due to the low number of computers available in most schools. Additionally, students and teachers reported that making time to visit the computer labs was difficult and restricted the use of computers within the classroom setting.   According to findings from the web-based student survey, computer use in school prior to the Maine Learning Technology Initiative comprised only a small portion of the students' educational instruction time. Of those students who responded to the survey, only 10%

reported that they used computers in school at least five hours a week or more before receiving their laptops. However, since the initiation of the laptop program the number of students reporting that they use computers in school at least five hours a week or more has increased to 65%.   As some students stated in interviews:

> "Last year we had to go to the computer lab down the hall and if there was a class going on there, you were out of luck, you couldn't do your research. With these [laptops] you just open up your laptop and boom, the Internet is there."

> "Last year we just had desktop computers . . . and we would have to go all the way down to the lab and then all the computers would be full and you had to wait, and it's a lot better this year because we all have our own."

> "And plus we can take them from classroom to classroom. Like in our science classroom last year we only had one computer, and it didn't work very well either. But [the laptops] work well."

In addition to no longer needing to access technology through the computer lab, the utilization of laptops within the classroom has lessened the need for students to share limited print and other resources in their classrooms and library. Instead of having to share one copy of encyclopedias or dictionaries, every student now has access to these resources via their laptop. One teacher remarked in an interview:

> "One of the things I see as most beneficial is that it's quick. There is no hesitation. There's no 'wait, I need to go get a dictionary.' … I don't have to prompt them to go to the media center to find media, they just do it."

As well as using the laptop to find information, students reported using their laptops to communicate via e-mail with teachers and classmates. Since the laptops were introduced in the schools, students are now able to e-mail both their teachers and fellow classmates when working on projects or if they have questions outside of the classroom. Almost two-thirds of students reported that they use their laptop to communicate via e-mail at least once a week or more.

The immediate e-mailing capability has also helped some teachers provide continuity in their instruction, even when they have had to be away from the classroom. One teacher reported on the Maine Learns website:

> "Another great way to use the laptops – I was out sick with my children for a couple of days. I e-mailed what was happening for the day to my students. I even set up times to be available for immediate responses to e-mails to answer any questions. It was great!"

While the students are using the laptops primarily for finding information, word-processing, and communicating with teachers and other students, it appears the implementation

of the laptop program is beginning to open up new ways of learning for many students. One

student remarked during an interview:

> *"I like Social Studies more because last year was before we had them we just kind of used the textbooks, but now we get to go on the Internet and actually, you know, some speeches that we have we can find on the Internet and on WorldBook and that makes it a lot more interesting."*

Another said:

> *"Actually it improved my reading because me, I don't like to read. And when I got the laptops I just loved reading the stuff online because it's pretty interesting, more than the textbooks."*

In addition to an increased interest in school, many students are reporting that the

presence of laptops makes their schoolwork easier to do, and helps them to improve the quality

of their work. Almost 85% of students felt this way, and roughly 69% of students stated that

laptops help them understand their classes better. Figure 2 represents the percentage of students

who agreed with the following statements about their attitudes and perceptions towards the

laptops.

Figure 2
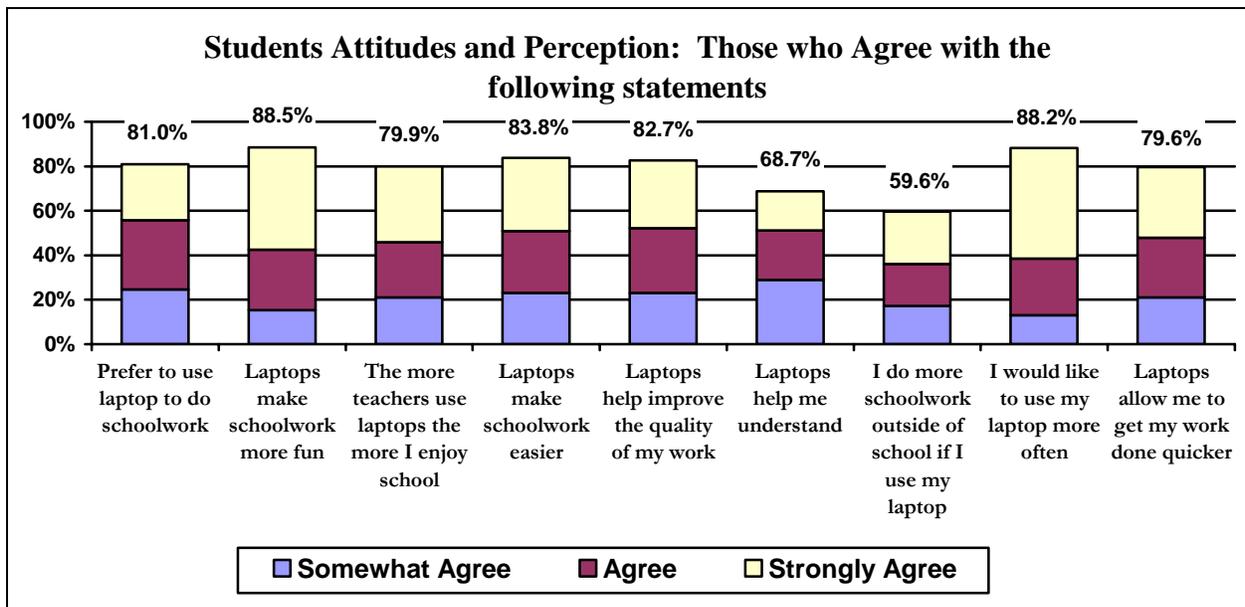
One student said in an interview:

> *"We all had to write a Native American story about their creator. We had to write a legend about it…It's just a lot of fun to do these things because you can be more creative when you have your own laptop right here."*

Another student said:

> *"Well, I think that it makes them[classes] a lot more interesting because before*
> *hand we had to use mostly outdated textbooks and so the laptops are a lot more*
> *up-to-date and actually it does help you motivate, motivates us a little bit because*
> *it's a lot more interactive."*

Interviews with teachers support students' agreement that the laptops are having a

positive impact on learning. One teacher leader reported to her RIM:

> *"I have noticed increased attention to task and an excitement about learning new*
> *computer skills."*

One teacher described the impact this way:

> *"My kids are really excited about writing time. I can't say that that's always*
> *been the case. Something's different this year. I'm finding, just looking at my*
> *first round of short stories, the average story is 5 pages! They're just willing to*
> *go further. It's so much easier to revise . . . there are lots of fun things to engage*
> *them . . . there are just a lot of connections, and they're feeling their creativity*
> *because they have a great tool."* (Teacher interview)

While the laptops appear to have a positive impact on students' work within school, some

students are also reporting some positive affects at home. When asked in interviews whether or

not they are using their home computer more or less since acquiring their laptops, many students

responded they are using their home computers more often to research information on the

Internet and to type their papers for school. Some students state that this increase is due to the

fact that they now have a better understanding of how to use their computers and the Internet.

> *"I think that I use it [home computer] more now because it's easier for me to*
> *understand technology a little bit better now because I'm more familiar with it."*
> (Student interview)

Also, more than half (60%) of those students who responded to the survey stated that they do

more schoolwork outside of school if they are able to use their laptop. While many schools have

yet to allow the laptops to go home, almost 90% of students stated that they would like to use

their laptops more often. One student in particular, when asked in an interview whether or not he

would like to take his laptop home with him, even if it meant receiving more homework replied,

"Yes, because we could still finish it quicker!"

Although the majority of students have not been able to take their laptops home yet, the

use of these tools within the classroom has helped to a certain degree to diminish the effects of

rural isolation for many students. Students and teachers alike now have the ability to connect to

information, resources, and people outside of their own region, state, and country via e-mail and

the Internet. Without leaving the classroom students have the opportunity to make "virtual"
tours of museums around the world, observe collections of marine sciences data, or hear authors
discussing writing and literature. Examples of comments from students and teachers are:

> *"In Geography we are doing the Middle East, like the mosques and stuff like that.
> We go on WorldBook and it shows you images and you get to look around the
> mosque. And we wouldn't normally be able to do that."* (Student interview)

> *"We have used them to research Maine artists in preparation for going to the
> Farnsworth Art Museum. The laptops have enabled students to view
> contemporary Maine artists through museums, personal artist websites, and the
> Maine Arts Commission. This allowed all students to see the art first hand. I
> never could have afforded all the slides and books to do this without the laptops."*
> (Teacher interview)

In addition, teachers reported that they expect all types of students to experience these
positive impacts of the laptops. Figure 3 represents teachers' ratings of the anticipated impact of
the laptops on eleven different learning-related behaviors for four different groups of students
described briefly as; traditional, at-risk, high-achieving, and students in special education
programs. According to the survey results, teachers anticipate improvements in all areas. Over
70% of teachers expect positive impacts for all students in class participation, motivation, and
engagement. They anticipate the greatest improvements for at-risk and special education students
who have a greater potential to be from an increased poverty area.

Figure 3

Teachers who reported anticipated Slightly Improved to Improved Impact on Students in the following areas:
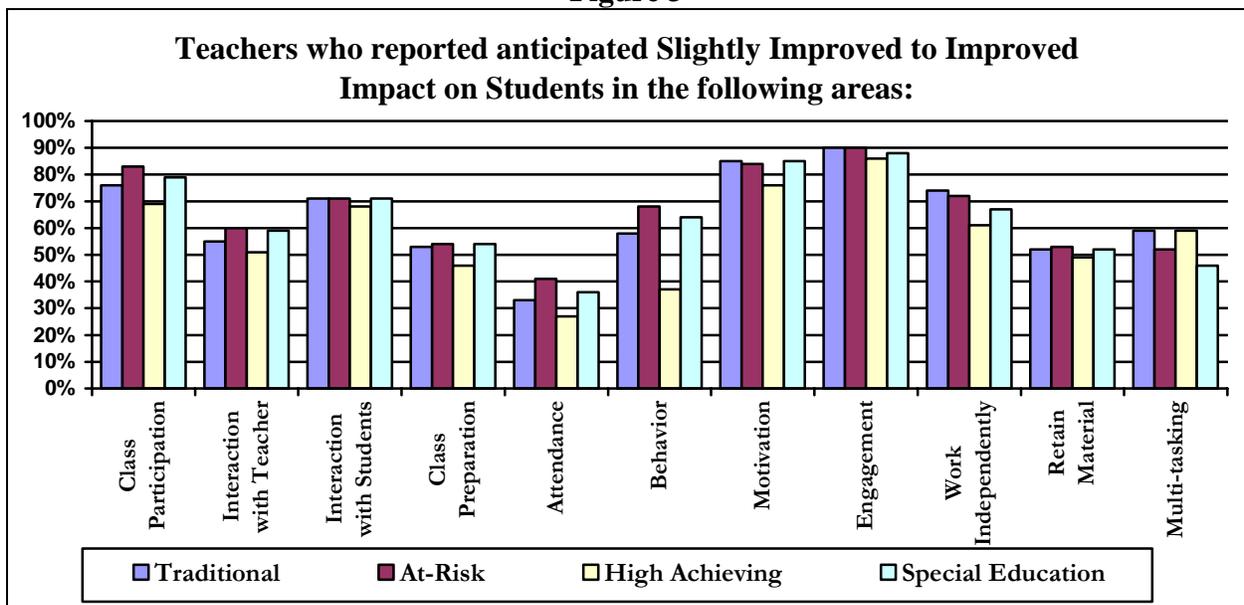
Interview data indicate that some teachers are already observing these changes:

> *"If you look at some of the needier kids, there's definitely been a marked improvement between on-task behavior, active participation. You know, that's a big thing. You've got kids that just tend to sit there and that active participation has gone up. Definitely by 75-80%."*

> *"Yeah, I think there are a lot of kids that would be at-risk that I've seen improve due to having a laptop . . . sometimes they're the ones that are excelling on the laptop and can help with the instructors too. I see a lot of that with the kids helping each other."*

> *"And the thing that I like, not only does it teach to the individual but especially the special needs kids, because it really, for most of them, levels the playing field, for these special needs kids. We've got some kids that have some pretty severe needs and they can do some stuff that's right up with the other kids."*

Students, teachers, and parents alike are reporting many positive impacts that the MLTI is having on students and their learning. The utilization of the laptops has provided the students with opportunities to gather knowledge not otherwise available with standard textbooks and other classroom materials. Faster, easier access to communicate more readily with teachers and peers has made learning and going to school, and even homework, a more pleasant experience. These observations about the impact of the laptops on student learning are generally true for all students including those students who teachers define as at-risk and students with disabilities. There is also evidence that the nature of learning within the classroom is changing with students taking more responsibility for their own learning. While it is still too early to determine the long term impacts that the laptop program may have on student learning, the early findings support the notion that students are more interested and engaged in school, a condition that is generally accepted as essential to learning.

Since a considerable number of schools have yet to allow laptops to go home, and some homes lack Internet access, some teachers are finding they must allow more time during the school day and in their classes for students to complete assignments which use the laptops and Internet. As one teacher put it:

> *"Certainly not everybody [has access to a computer at home] which is kind of an issue at this point, in a way, in terms of assignments and homework and expectations that way. Anything involving the Internet I stay away from just because there are enough students here that don't have either a computer or computer with Internet access at home that it limits those possibilities."*

These problems, reflective of the "digital divide", should diminish once all students are permitted to take the laptops home to complete homework. However, recent evidence still suggests many districts are not planning to send the laptops home. In the survey of principals of 7th graders conducted in the fall of 2002, 55% indicated that they would be sending the laptops home, 36% indicated they would not send them home, and 8% were undecided at that time. While the evidence is still being collected, the data so far indicate that a majority of schools will not be sending the laptops home and although not the only reason, the problem of insuring the laptops when taken off school property is a major deciding factor. The cost of insuring the laptops when they are allowed to be taken home by students is an important policy issue and obstacle that has not yet been resolved by many schools. The laptops are covered on the school's existing insurance as long as they are on school property; however, they are not covered once they are taken off school property. Recently, the Maine School Management Association (MMSA) has contracted with the Fireman's Fund property and casual trust insurance company to offer insurance on the laptops outside of school for $25 per year to members of the MSMA property and casual insurance, and $30 per year for non-members. As of the end of February only 23 schools had picked up the additional insurance.

The evaluation team is currently compiling data regarding how many schools have opted to purchase some form of insurance, and those who have not; and also who is responsible for paying for the insurance, the school or the parents. If the school expects the parents to pay for the insurance, what about the children whose parents cannot afford it? Yet another digital divide obstacle that needs to be addressed statewide. To date, surveys have been received from approximately 57 schools. Of this limited sample, 35% of the principals have indicated that students currently are allowed to take their laptop home. Unfortunately, as can be seen in the table on the next page, it appears that the majority of those who are not sending them home are also in an area of higher poverty, which may indicate that fewer have access to computers and the internet at home. By not allowing the laptops to go home, the digital divide is still a major issue for many of Maine's children.

Another obstacle to taking the laptops home is the problem of providing filtered Internet access at home, and how that would be controlled. A $4,800,000 gift has been earmarked to provide home Internet access to all students who need it via the MiddleMaine server. By using the MiddleMaine server, the students would have the same restricted access at home that they

currently have while accessing the Internet at school. Providing internet access at home will bridge another major obstacle of the digital divide especially in the more rural and higher poverty areas in Maine.

Table 1

Laptops Are Not Going Home				Laptops Are Going Home		
School	**County**	**% Students Receiving Free/Reduced Lunch**		**School**	**County**	**% Students Receiving Free/Reduced Lunch**
School AA	York	8.94		School XA	Cumberland	2.08
School AB	Waldo	9.38		School XB	Cumberland	2.36
School AC	Androscoggin	16.54		School XC	Hancock	6.99
School AD	Sagadahoc	18.10		School XD	Cumberland	10.40
School AE	Kennebec	18.62		School XE	Hancock	12.21
School AF	Penobscot	20.10		School XF	Penobscot	14.07
School AG	Cumberland	21.43		School XG	Hancock	14.47
School AH	Penobscot	23.54		School XH	Kennebec	18.07
School AI	Aroostook	29.34		School XI	Lincoln	30.94
School AJ	Aroostook	29.63		School XJ	Sagadahoc	32.20
School AK	Lincoln	29.71		School XK	Lincoln	34.10
School AL	Sagadahoc	32.08		School XL	Somerset	39.88
School AM	Aroostook	33.76		School XM	Penobscot	40.96
School AN	York	34.19		School XN	Piscataquis	41.83
School AO	Hancock	36.21		School XO	Kennebec	46.18
School AP	Oxford	36.36		School XP	Hancock	47.67
School AQ	Knox	36.71		School XQ	Washington	54.81
School AR	Aroostook	40.31		School XR	Washington	66.67
School AS	Oxford	47.39				
School AT	Aroostook	48.06				
School AU	Penobscot	49.20				
School AV	Washington	49.65				
School AW	Aroostook	51.55				
School AX	Somerset	57.09				
School AY	Washington	57.84				
School AZ	Aroostook	58.33				
School BA	Penobscot	58.96				
School BB	Aroostook	59.04				
School BC	Penobscot	59.49				
School BD	Washington	62.24				
School BE	Washington	65.84				
School BF	Washington	72.80				
School BG	Penobscot	76.15				
School BH	Aroostook	87.23				

Source: Maine Department of Education, 2003.

The evidence collected and presented here from the Mid-Year Evaluation of the Maine Learning Technology Initiative, clearly indicates a positive effect on teaching and learning using this technology tool. By making the laptops available to all students and teachers in the 7th grade across the state of Maine, a significant impact has already been made on bridging the digital divide in Maine. The continued differences in Maine based on geographic location, economic
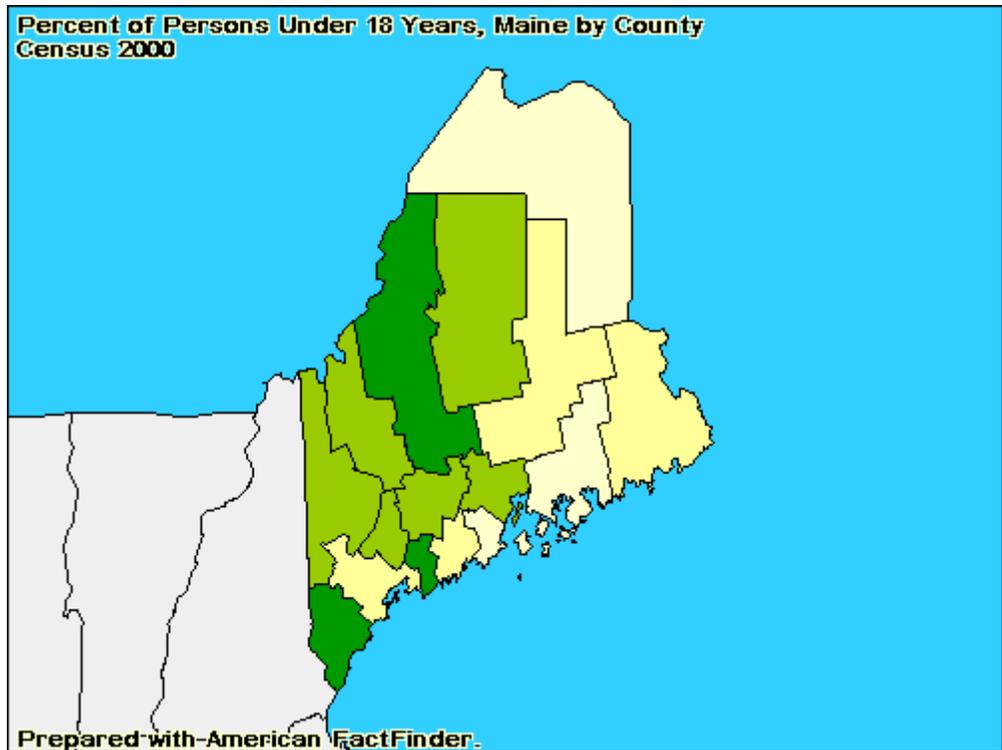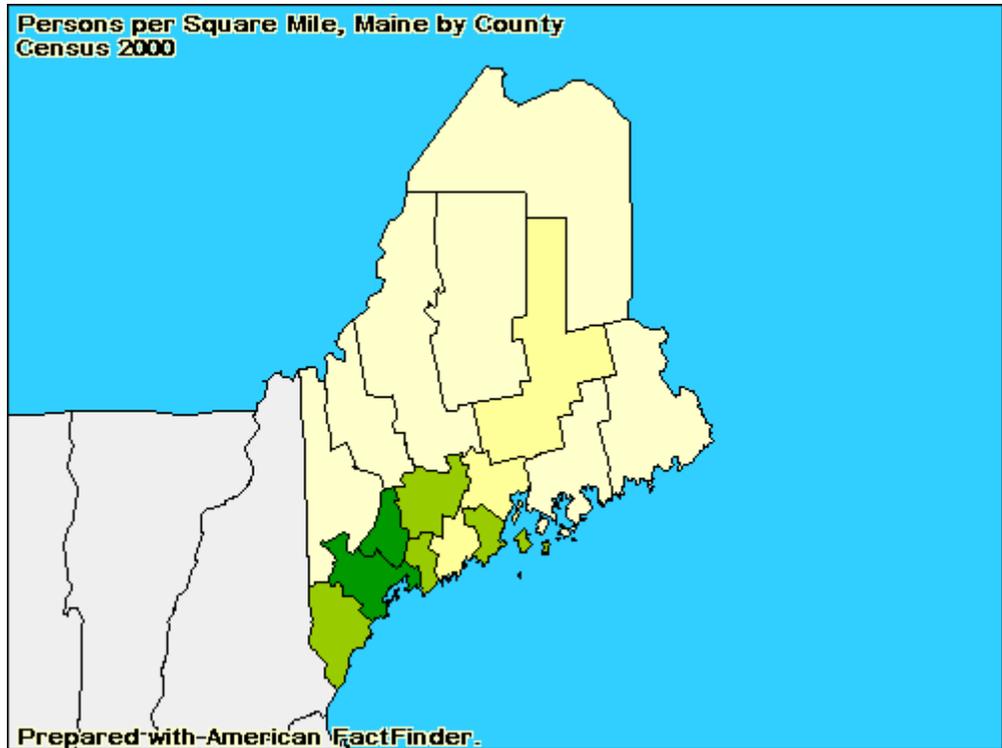
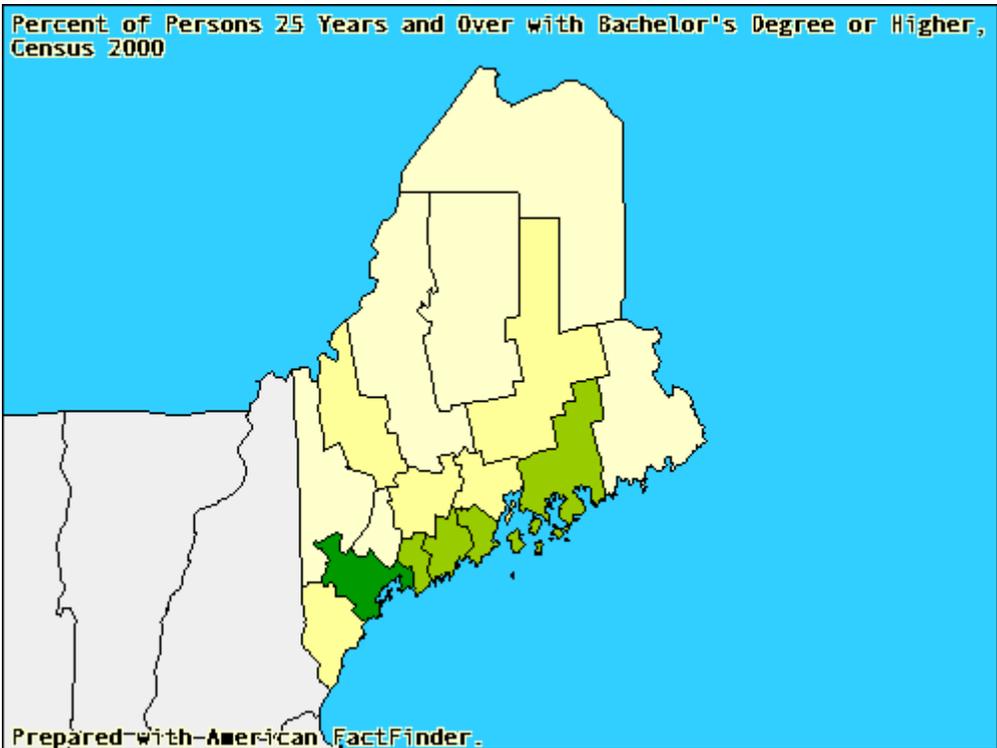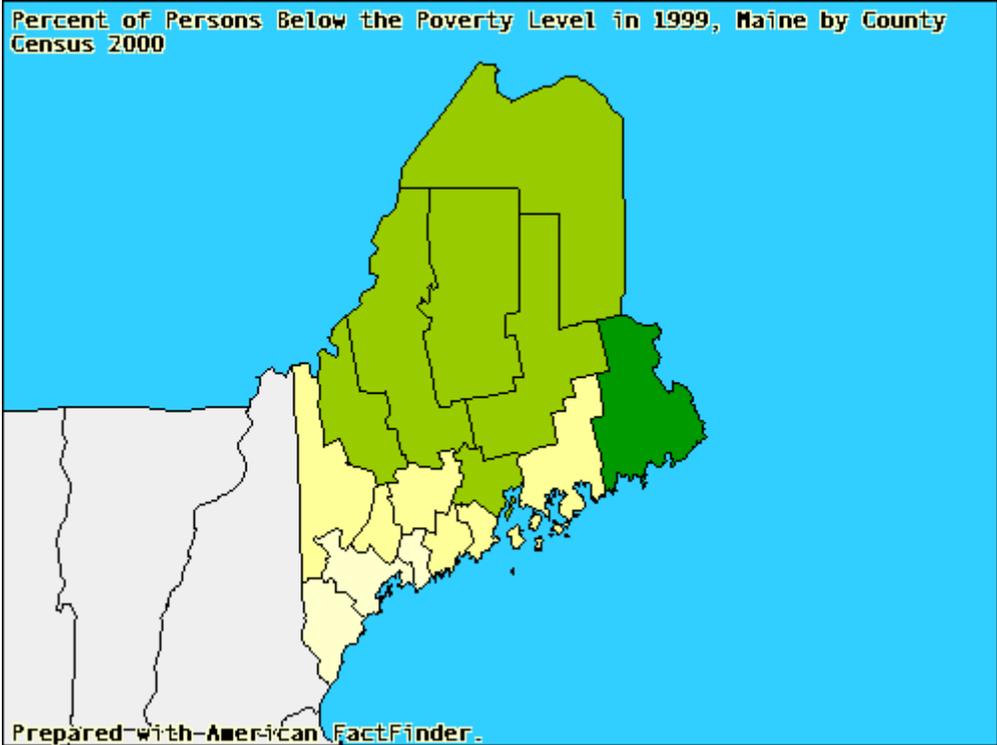status, physical abilities, and education level of parents no longer need to limit the success of children.

The Maine Learning Technology Initiative has successfully begun to provide (1) access to information, the Internet, and other information technologies and services, and (2) the skills, knowledge and abilities to use information, the Internet, and other technologies to students. By bridging the digital divide all children of Maine will have the opportunity to develop the 21st Century skills they will need to succeed in the world today. We are already seeing evidence of many of those 21st Century skills including increasing application and production of knowledge for the real world; increasing the ability for students to manage learning; increasing the ability to promote achievement for special needs students; and improving access to information that increases knowledge, inquiry and depth of investigation. It is too soon to know if the skill of improving scores on standardized tests is happening, but data relating to this skill will be collected as the evaluation continues.

One note of caution: It is important to remember that the digital divide is about more than just access to computers and the Internet. Solomon, et al., (2003) listed the conditions necessary in order to achieve digital equity in education. (1) Students and teachers must have access to up-to-date hardware, software, and connectivity. (2) Students and teachers must have access to meaningful, high-quality, and culturally responsive content along with the opportunity to contribute to the knowledge base represented in online content. (3) Educators must know how to use digital tools and resources effectively. And, (4) Access to systems must be sustained by leaders with vision and support for change through technology. All of these conditions are being met or partially met at this time but will need to be continually monitored as the program continues in order to achieve digital equity.

The findings in this report indicate the beginnings of bridging the digital divide in Maine at least for 7th grade students and teachers. Now all Maine children and teachers need to be provided the same type of access and skills and Maine will indeed become "the premier state for utilizing technology in kindergarten to grade 12 in order to prepare students for a future economy that will rely heavily on technology and innovation."

Appendix A

Thematic Maps of Maine

Persons per Square Mile, Maine by County
Census 2000

**Legend
Data Classes**

Persons/Sq Mile

4 – 33

43 – 74

108 –188

221-318

Prepared with American FactFinder.

Percent of Persons Under 18 Years, Maine by County
Census 2000

**Legend
Data Classes**

Percent

22.3-22.6

22.7-23.3

23.4-24.2

24.7-25.8

Prepared with American FactFinder.

Percent of Persons Below the Poverty Level in 1999, Maine by County
Census 2000

**Legend
Data Classes**

Percent

	7.9-8.6
	10.1-11.8
	13.7-14.9
	19.0-19.0

Prepared with American FactFinder.

Percent of Persons 25 Years and Over with Bachelor's Degree or Higher,
Census 2000

**Legend
Data Classes**

Percent

	11.8-15.7
	20.3-22.9
	25.0-27.1
	34.2-34.2

Prepared with American FactFinder.

References

CEO Forum on Education & Technology (2001). "Key Building Blocks for Student Achievement in the 21st Century." Available at: www.ceoforum.org.

Corporation for Public Broadcasting. (2002). "Connected to the Future: A report on Children's Internet Use." Available at: http://.cpb.org/ed/resources/connected.

Maine Education Policy Research Institute. (2003). "The Maine Learning Technology Initiative: Teacher, Student, and School Perspectives Mid-Year Evaluation. Available at: www.cepare.usm.maine.edu

Soloman, G., Allen, N., & Resta, P. (2003). "Toward Digital Equity: Bridging the Divide in Education." Pearson Education Group, Inc. Boston, MA.

Wilhelm, T., Carmen, D., & Reynolds, M. (2002). "Connecting Kids to Technology: Challenges and Opportunities." *Kids Count Snapshot*, Annie E. Casey Foundation, Baltimore, MD.

U.S. Census Bureau. (2003). American FactFinder. Available at: http://factfinder.census.gov.