

Great Maine Schools Project

at the Senator George J. Mitchell Scholarship Research Institute

Distance Learning via ATM in Maine High Schools 2001-2004



September 2004

Mitchell
Institute
SENATOR GEORGE J. MITCHELL
SCHOLARSHIP RESEARCH INSTITUTE

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PREFACE

The mission of the Great Maine Schools Project is to promote, support, and sustain an effective, collaborative, statewide movement based on the Core Principles and Practices of *Promising Futures: A Call to Improve Learning for Maine's Secondary Students*. The central elements of the project are equity of opportunity for all high school students, access to rigorous curricula, and personalization of the learning experience in high school. The Great Maine Schools Project is working to engage every Maine school district and its high schools in creating new practices, policies, and structures. Our vision is that each Maine child—including those who live in high-poverty and low-aspirations communities—has the ability and skills to make personal choices for a promising future, whether in college, work, or citizenship.

The Maine Distance Learning Project provides educational opportunities for students in Maine regardless of location. Maine has a highly developed distance-learning classroom network that provides real-time audio and video transmission between high schools. The network has the capacity to interactively connect four different sites in a real-time broadcast-quality conference setting, while all 91 sites can receive a broadcast simultaneously. The network equipment has been installed in 79 of Maine's 131 public and approved private high schools, and in 12 additional sites. It is interoperable with other types of videoconferencing technologies used throughout Maine, as well as technologies used in other states and countries.

Maine ranks second in the nation in both the percentage of the population living in rural communities and the percentage of K-12 students enrolled in rural schools (Rural School and Community Trust, 2003). The population of Maine under the age of five declined by 17% from 1990 to 2000, and the vast majority of Maine school districts are experiencing declining enrollments that are projected to continue for the foreseeable future. Declining enrollments mean fewer resources for schools to maintain adequate academic programs. In addition, many rural communities in Maine have difficulty attracting qualified teachers. At the Great Maine Schools Project, we have learned that courses of study vary greatly from school to school across Maine, and that only some high school students have access to rigorous academic courses.

Distance learning via ATM (or Asynchronous Transfer Mode, the method used to transmit data) has the potential to deliver high-quality courses to more Maine students. The promise is especially great for geographically-isolated students enrolled in smaller rural high schools. These schools do not have the resources to provide a full range of course offerings on site, especially higher-level math and science courses, a variety of foreign language courses, and a full complement of Advanced Placement (AP) courses. Opportunities to receive courses via ATM can expand the offerings to students at small schools, while offering courses via ATM may help schools retain teachers who no longer have enough students at their school alone. Distance learning also provides opportunities for groups of schools to share the cost of additional teachers in specialty areas—an expense that may be unaffordable for individual schools.

This report examines the use of distance learning via ATM for high school courses over the past three academic years. It presents the results of a survey of teachers who taught high school ATM classes last year, and makes some suggestions for ensuring the successful implementation of distance learning via ATM in Maine high schools.

EXECUTIVE SUMMARY

Currently, 79 of Maine's 131 public high schools are equipped with ATM technology, as are five technical centers/regions and seven other sites. Asynchronous Transfer Mode—or ATM—is the method that the Maine Distance Learning Project uses for transmitting audio and visual signals. This report describes the use of distance learning via ATM in Maine high schools over the past three school years. The Great Maine Schools Project at the Mitchell Institute, funded by a grant from the Bill and Melinda Gates Foundation, supported this research.

ATM use for high school courses has dramatically increased over the past three academic years:

- ♦ The number of Maine high schools that *offer or receive* at least one ATM course more than doubled over the past three school years, growing from 17 in 2001-2002 to 43 in 2003-2004.
- ♦ The increase in ATM use was particularly dramatic in small high schools. In 2001-2002 and 2002-2003, there were four high schools, with enrollments of fewer than 300 students, offering or receiving ATM courses; this number grew to 20 in 2003-2004.
- ♦ The greatest growth in ATM use has been in Maine's rural high schools.
- ♦ The total number of ATM courses shared by Maine high schools grew from nine in 2001-2002 to 16 in 2002-2003. By 2003-2004, 33 ATM courses were reaching 82 classrooms.
- ♦ A wide variety of courses are now shared via ATM, with mathematics and foreign-language courses being the most common.
- ♦ Looking ahead, 16 new classes have been proposed for the 2004-2005 academic year, which suggests that ATM use in Maine high schools will continue to grow exponentially.

This spring, the Great Maine Schools Project surveyed high school teachers who taught ATM courses in 2003-2004. The survey found that teachers see three primary benefits of ATM:

- ♦ Students gain access to courses they would otherwise be unable to take.
- ♦ Students have the opportunity to interact with teachers and students from other schools across Maine.
- ♦ Teachers are acquiring new skills and using more audio-visual media to present material.

Drawbacks of ATM that teachers have identified include:

- ♦ Some teachers perceive that they do more direct instruction and are less likely to make connections with individual students in ATM classes.
- ♦ Students and teachers tend to have less personal contact in ATM classes.
- ♦ There have been some technical problems in ATM classrooms.

Now that the ATM system is fully deployed, we suggest four key areas of focus to ensure that it is successfully implemented and fulfills its promise for Maine students:

- ♦ Ensure that ATM teachers and support staff are fully trained, both in technical skills and in effective instructional strategies. This includes designating a dedicated and trained support person in every sending and receiving ATM classroom.
- ♦ Gain active support from, and promote collaboration among, the principals of all high schools equipped with ATM.
- ♦ Encourage more schools equipped with ATM—particularly large schools—to offer courses.
- ♦ Expand the use of ATM for professional development in order to provide more training opportunities for teachers and reduce travel expenses.

I. Introduction

The Maine School and Library Network (MSLN) is a communications system that connects public schools, approved private schools, and public-access libraries across the state, both with the Internet and with each other. Many of the MSLN sites are equipped with advanced, interactive video technology that can be used for classroom instruction, videoconferencing, and other applications. Distance learning via ATM is used for high school, college, and continuing- and adult-education courses, as well as for professional development opportunities, meetings, videoconferences, presentations, and other educational experiences. The technology is available 24 hours a day, seven days a week, and sites can schedule sessions themselves.

Proceeds from a \$15-million state bond issue provided the infrastructure and classroom equipment for high schools. Funding for ongoing network support and service maintenance is provided through a combination of general fund appropriations from the Maine Legislature, the Maine Telecommunication Education Access Fund, local school unit expenditures, and Federal E-Rate (a fund that provides affordable telecommunication services to communities). The Maine Department of Education (DOE) contracts with the University of Maine System Network (UNET) to provide support, maintenance, and help-desk services for ATM classrooms.

Currently, there are 91 ATM sites, six of which have been newly added for the fall of 2004. Seventy-nine of Maine's 131 public and approved private high schools, five of the 27 technical regions/centers, and two youth-development centers are part of the Maine Distance Learning Project and are equipped with ATM technology. The other five distance-learning sites are: the Bangor Public Library, the Maine Department of Education, the Governor Baxter School for the Deaf, the Maine State Library, and the University of Maine at Orono. (See Appendix 1 on pages 19-21 for a complete list of ATM sites and a map of their locations.)

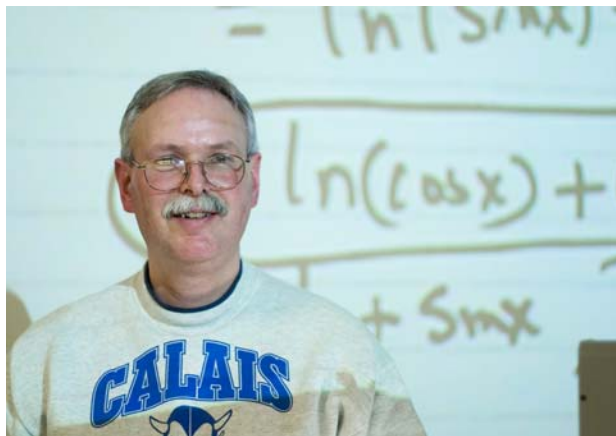


Governor John Baldacci talks with students at Jonesport-Beals High School via ATM

In addition to the courses detailed in this report, many high schools around the state use ATM for other instructional purposes. (Regularly updated information on distance-learning projects and

resources is available at the project's website: www.mainedistancelearningproject.org.) There has been significant growth in community and state-agency use of the ATM network, and every ATM site reported using the system in 2003-2004. Examples of non-course uses of ATM during the 2003-2004 academic year include:

- Bonny Eagle High School hosted a discussion with United States Attorney Paula Silsby about the USA Patriot Act. Students at Capital Area Technical Center, Morse High School, and Mt. Ararat High School also participated in the discussion.
- Jonesport-Beals High School students engaged in an interactive discussion with Governor John Baldacci and shared a virtual world tour.
- Students at Lawrence Junior High School shared their student-television programs with students at other middle schools.
- The Finance Authority of Maine (FAME) broadcasted financial-aid nights for students and parents to high schools equipped with ATM.



John Moody, AP Calculus teacher at Calais High School, using ATM

II. Distance Learning via ATM in Maine High Schools

Number and Size of High Schools Sharing ATM Distance-Learning Courses

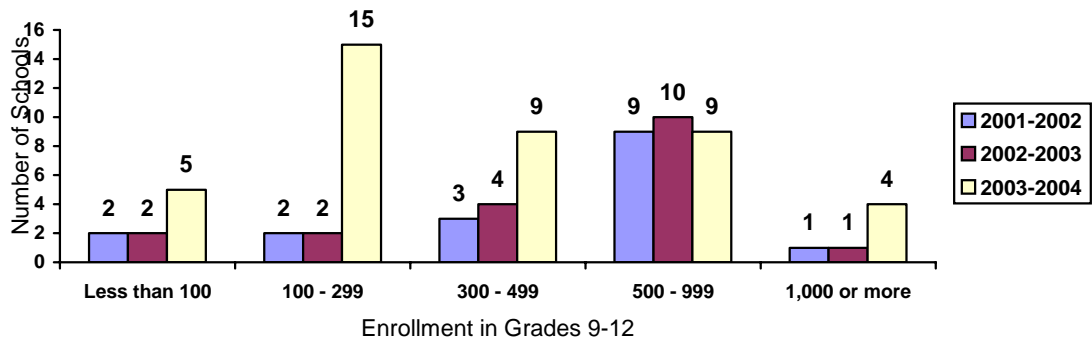
As shown below, the number of high schools either offering or receiving at least one distance-learning course via ATM more than doubled in the past three school years. Most of the increase occurred during the last academic year.

Maine High Schools Using Distance Learning via ATM for Courses, 2001-2003

	SCHOOL YEAR		
	2001-2002	2002-2003	2003-2004
Schools offering ATM courses	5	6	22
Schools receiving courses	13	17	32
Total number of schools using ATM	17	20	43

Both the number and proportion of small high schools that share distance-learning courses has increased dramatically during the last three school years, as shown in the chart below. During the 2001-2002 and 2002-2003 school years, less than one-quarter of the high schools sharing distance-learning courses via ATM were small (enrolling fewer than 300 students in grades 9-12). In 2003-2004, the number of small high schools sharing distance-learning courses increased from four to 20, and these schools now make up nearly one-half of all Maine high schools offering and/or receiving ATM courses for their students.

Number of High Schools Sharing Distance-Learning Courses via ATM by Size



Note: This chart does not include technical-center sites sharing ATM courses (Tri-County Tech Center in 2002-2003 and Caribou Technical Center in 2003-2004).

Location of High Schools Using ATM for Distance Learning

The greatest growth in the use of ATM for distance-learning courses has been in Maine's rural high schools. The number of high schools in Aroostook County sharing courses via ATM increased from one in 2001-2002 (and zero in 2002-2003) to 11 in 2003-2004. In Washington and Hancock counties, the number of high schools sharing courses via ATM grew from two in 2001-2002 and three in 2002-2003 to eight in 2003-2004. In Penobscot and Piscataquis counties, the number of high schools sharing distance-learning classes has doubled each school year, as shown in the table below.

Number of High Schools Sharing Courses via ATM by Region

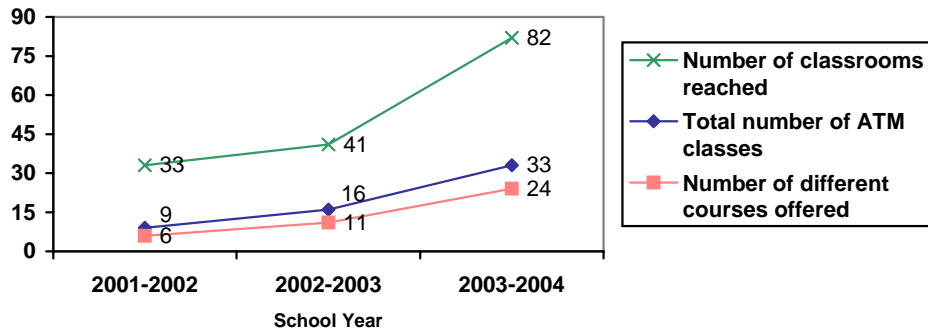
Region	SCHOOL YEAR		
	2001-2002	2002-2003	2003-2004
Aroostook	1	0	11
North Central (Penobscot, Piscataquis)	1	2	4
Downeast (Hancock, Washington)	2	3	8
West (Franklin, Oxford, Somerset)	4	6	7
Central (Androscoggin, Kennebec)	6	6	7
Midcoast (Knox, Lincoln, Sagadahoc, Waldo)	0	0	1
South (Cumberland, York)	3	3	5
TOTAL	17	20	43

In many cases, high schools share distance-learning courses with other schools in their county or region. But in several cases, high schools are sharing courses with schools located farther away:

- ♦ East Grand High School in Washington County offers Japanese I to students at Southern Aroostook Community School and Hodgdon High School—both in Aroostook County—and Katahdin High School in Penobscot County.
- ♦ Lewiston High School in Androscoggin County offers Conversational Spanish to students at Easton and Limestone High Schools in Aroostook County.

Number and Type of ATM Distance-Learning Courses

ATM Distance-Learning Courses at Maine High Schools, 2001-2004



The total number of ATM classes shared by Maine high schools more than tripled from 2001 to 2003, and more than doubled during the 2003-2004 school year alone. As shown in the chart above, the number of different courses offered has also increased dramatically since 2001, and has more than doubled from 2002-2003 to 2003-2004. Distance learning via ATM has proven to have a multiplying effect, which is demonstrated by the fact that the nine courses shared in 2001-2002 reached students in a total of 33 classrooms, the 16 courses in 2002-2003 reached 41 classrooms, and the 33 courses shared in 2003-2004 reached a total of 82 classrooms.

As shown in the table below, the number of ATM distance-learning courses in every discipline, except science, has grown every year since 2001-2002. During the past year, the total number of Advanced Placement (AP) courses offered via ATM more than tripled, from two to seven.

Type of Course Shared via ATM	SCHOOL YEAR		
	2001-2002	2002-2003	2003-2004
Business	0	0	1
Computers	0	0	2
Foreign Language	7	12	19
Math	1	2	8
Science	1	1	1
Government or History	0	1	2
TOTAL	9	16	33
Total Number of AP Classes	2	2	7

A wide variety of classes was offered via ATM during the 2003-2004 school year, including: Accounting, Algebra, American Sign Language (ASL) I, ASL II, AP Calculus, Computer Applications, AP Environmental Science, European History, French III, German, Japanese I, Japanese II, Latin I, Latin II, Maine History, Marketing, Precalculus, Spanish I, Spanish II, Conversational Spanish, AP Statistics, and AP World History.

Profile #1: Hall-Dale High School

Hall-Dale High School has been sharing courses via ATM for several years. In 2003-2004, 29 students at other schools received the courses that Hall-Dale offered:

- ◆ **Japanese I** to Erskine, Ellsworth, and Poland Regional High Schools.
- ◆ **Japanese II** to Erskine High School.

32 of Hall-Dale's 400 students enrolled in courses offered via ATM by other schools:

- ◆ **American Sign Language (ASL) I** and **ASL II** from Baxter School for the Deaf.
- ◆ **Introduction to Visual Basic** from Winthrop High School.
- ◆ **Latin I** and **Latin II** from Erskine High School.

According to Principal Steve MacDougall, "ATM does not replace teachers; it allows us to offer courses we otherwise couldn't. The potential for ATM is great, both in what we can offer to our students and to students at other schools."



Naoto Kobayashi, Japanese teacher at Hall-Dale High School

High School Students Participating in Distance Learning via ATM

More than one-half (58%) of Maine high school students attend schools that are equipped with ATM. During the 2003-2004 academic year, a total of 504 Maine high school students were enrolled in distance-learning courses being offered via ATM. Courses ranged in size from 3 to 27 students, but the average number of students in a distance-learning course was 15 and the median was 16. Data on the number of students participating in previous years are not available.

Monthly Usage of the Distance-Learning Network

Each month UNET prepares a report for the Maine Department of Education on distance-learning network usage. The table below shows the average usage between September 2003 and May 2004. These figures include ATM use for high school courses and other educational opportunities for students, educators, and communities.

Measure of Distance-Learning Network Usage	Monthly Average September 2003-May 2004
Number of sites originating (hosting) content	43
Number of sessions	527
Hours of usage	737
Number of sites reporting usage	78

Source: *DOE ATM Distance Learning Network Usage Report, May 2004*, from the Maine Department of Education. See Appendix 2 on pages 23-26 for excerpts from the full report on ATM use from September 2001 to May 2004.

Technical Assistance and Professional Development

The Department of Education offers several training sessions for educators at ATM sites:

- Technical Training for a school's staff is offered when the site first receives its ATM equipment. This training takes one full day, and it provides the information that technical-support personnel need to properly run and manage the distance-learning classroom. DOE also provides refresher and new-staff training at the end of August and the beginning of January.
- End User Training takes four full days and is designed for educators planning to offer distance-learning courses. Day One familiarizes teachers with classroom equipment, scheduling procedures, and troubleshooting protocols. Day Two helps teachers convert or modify traditional classroom practices and materials for the distance-learning environment. On Day Three and Day Four educators practice teaching courses on the system. These sessions are also offered on videotape, and during refresher or new-staff training in August and January of each year.
- GATES Training helps administrators organize a distance-learning program in their high school or technical center. The training is offered in two parts, or a total of 10 hours.
- Training modules are also available for specific tools and skills that help with teaching ATM courses (e.g., PowerPoint, Photoshop, Web design and Internet, presentation techniques, and interoperability).

The Department of Education reports that a total of 397 teachers have completed introductory training in the use of the ATM system and 50 teachers have completed advanced training.

Since 2003, the University of Maine System Network (UNET) has offered additional ATM training and/or demonstrations of the technology's capabilities at high schools around the state. During the 2003-2004 academic year, UNET made site visits to 22 high schools and provided training to 86 school-staff members. UNET also made demonstrations of ATM capabilities and distance-learning technologies that reached an additional 207 educators.

In 2003, DOE and UNET collaborated on Project Interactive, which provided grants to teachers in Maine high schools delivering new ATM courses in 2003-2004. Project Interactive offered one \$2,500 grant and four \$2,000 grants to support the following new courses: Precalculus, AP Calculus (2), AP Environmental Science, Computer Applications, and German.

Profile #2: Penquis Valley Region

A group of three schools in the Penquis Valley region—Penquis Valley, Dexter Regional, and Piscataquis Community high schools—worked together to create and institute a common daily schedule and school-year calendar. This has allowed the three rural schools—with total enrollments in grades 9-12 ranging from 280 to 369—to share more courses via ATM. In 2004, Nokomis Regional High School will join the group, and the four schools will share a total of seven ATM courses.



Steve Veit, AP Environmental Science teacher at Penquis Valley High School

During the 2003-2004 school year, 48 students in the region took the following courses via ATM:

- ◆ **AP Calculus**, offered by Dexter High School
 - ◆ **AP Environmental Science**, offered by Penquis Valley High School
 - ◆ **Maine History**, offered by Dexter High School
 - ◆ **Marketing**, offered by Penquis Valley High School
 - ◆ **Precalculus**, offered by Dexter High School.
- Dexter Principal Bruce Bailey says, "Thanks to ATM, we will enrich our curriculum with classes like AP Music Theory and History of Journalism, and share teaching time for subjects that have small numbers of students. These are things we wouldn't be able to do otherwise. Last year it went very smoothly, and the coming year will be our best yet."

Looking Ahead

Six new ATM sites—five high schools and one technical center—have been added for the 2004-2005 academic year. In addition, UNET was selected to administer a three-year grant from the Maine Department of Education, which is funded by the US Department of Education's Advanced Placement Incentive Program to help stimulate growth in AP course offerings via ATM. Sixteen new ATM classes have been proposed for the 2004-2005 academic year, which suggests that the number of high school ATM courses will continue to grow. UNET was also selected to link and coordinate AP courses delivered via ATM with online providers such as The Virtual High School.

III. Survey of ATM Teachers

The Great Maine Schools Project conducted a survey of high school teachers who taught at least one ATM course during 2003-2004. Twenty-five teachers were surveyed, and 16 responded to the survey (a 64% response rate) between April and June 2004. Twelve teachers responded to an online survey and four responded to a mailed paper-and-pencil version of the survey.

Years Teaching ATM Distance-Learning Courses

As shown in the table below, more than four in five respondents (88%) indicate that this is their first year teaching a distance-learning course via ATM.

Years Teaching ATM Courses	Number of Respondents	Percent
One year or less	14	88%
Two years	0	0
Three years	1	6%
Four or more years	1	6%

ATM Courses, Number of Receiving Sites, and Student Enrollment

Respondents were asked what ATM courses they have taught, and how many receiving sites and students have participated in each of their ATM courses. Altogether, respondents report having taught a total of 27 ATM courses, starting as early as 2000-2001. One-half of the survey respondents (8 teachers) teach ATM courses in foreign languages, including Japanese, Spanish, German, and Latin. Five respondents teach ATM courses in math (primarily AP Calculus, but also Precalculus and Accounting). Two respondents teach computer courses, and one teaches a science course (AP Environmental Science) via ATM.

More than one-half (52%) of the ATM courses taught by survey respondents had two or more receiving sites, and 48% had one receiving site, as shown below. About two-thirds (65%) of these ATM courses had ten or more students, and 35% had fewer than ten students.

ATM Courses Taught by Survey Respondents: Receiving Sites and Student Enrollment

Number of Receiving Sites	Number of Courses	Percent
One	13	48%
Two	5	19%
Three	6	22%
Four	3	11%
Number of Students Enrolled		
Fewer than 10	9	35%
Between 10 and 20	12	46%
More than 20	5	19%

Teacher Skill Level

Teachers were asked to rate their own skill level using ATM technology for teaching. As shown below, one-half of respondents consider themselves to be *intermediate* and another 44% deem themselves *beginner*. One respondent rates himself *advanced*, while no teachers consider themselves *novice*.

Skill Level Using ATM Technology for Teaching	Number of Respondents	Percent
Novice (still learning to use the technology)	0	0
Beginner (use several sources, but little interaction between students and teacher)	7	44%
Intermediate (use a variety of sources with some interaction between students and the teacher)	8	50%
Advanced (use appropriate sources effectively, and class is highly interactive)	1	6%

Impact on Teaching Skills

Nearly two-thirds (63%) of respondents indicate that teaching via ATM has had an impact on their teaching skills. Teachers describe positive impacts, such as an increased awareness of the need interact more with students or display greater patience. They also describe an improvement in their explanatory skills and the ability to integrate high-tech and low-tech teaching practices. One teacher says that teaching via ATM “forced me to be more interactive with the receiving students and made me more aware of my writing style/size/etc.” Another teacher says, “I’ve had to be more aware of how I interact with students and have regular interaction.”

Classroom Activities and Teaching Practices

Survey respondents were presented with a list of classroom activities and teaching practices. They were asked how often each activity or practice occurs in ATM classes compared to classes they teach in traditional classrooms. As shown in the table below, the majority of respondents report that most of the practices occur about as often in the ATM classroom. The three exceptions are: 1.) *teacher presents material using more than one medium*, 2.) *students present their work during class*, and 3.) *students interact with other students*.

Survey responses suggest that the activities likely to occur less often in the ATM classroom than in traditional classrooms are: 1.) *students present their work during class*, 2.) *students work on group projects*, and 3.) *students interact with other students*. Two activities appear likely to occur more often in ATM classrooms are: 1.) *direct instruction* and 2.) *teacher presents material using more than one medium*. Response patterns to these questions remained consistent regardless of how the individual teachers rate their own skill level using ATM technology for teaching.

**Occurrence of Selected Activities in ATM Classrooms
Compared to Traditional Classrooms**

Classroom Practice/Activity	Less Often	About as Often	More Often
Teacher presents material using more than one medium	19%	44%	38%
Students interact with other students	44%	44%	13%
Students present their work during class	50%	44%	6%
Direct instruction	6%	50%	44%
Teacher makes connections with individual students	38%	50%	13%
Students work on group projects	44%	50%	6%
Students engage in multiple activities during class	31%	69%	0
Student interests influence lessons	13%	73%	13%
Students review their own work	13%	75%	13%
Teacher evaluates student work	19%	75%	6%
Students interact with the teacher	13%	81%	6%
Quizzes and tests	9%	81%	0

ATM Training

Teachers were asked how much training they have received in teaching via ATM. As shown below, three-quarters of survey respondents (12 teachers) have received one full day of training or more. But only three respondents (19%) report having participated in more than two days of ATM training. Three teachers report receiving training for half a day or less, and one reports having received no training in teaching via ATM.

Amount of ATM Training Received	Number of Respondents	Percent
None	1	6%
Half a day or less	3	19%
One full day	5	31%
Between one and two days	4	25%
More than two days	3	19%

Two-thirds of the respondents who received ATM training rate the training *somewhat effective*. Slightly more than one-quarter (27%) rate their ATM training *very effective*, and one respondent rates the training *not too effective*, explaining that there were no handouts and not enough hands-on training with the equipment.

Exactly one-half of respondents indicate that additional training or assistance would help them teach via ATM. Suggestions include learning new techniques to get students at remote sites more involved in class, learning more about practices other ATM teachers are using. Other suggestions include receiving more hands-on training with the equipment in the ATM room and receiving more training on solving technical difficulties that may arise.

Technical Issues

All survey respondents report that they have encountered some technical problems with ATM during their classes. One-half of respondents characterize the technical problems as *somewhat disruptive*, 44% characterize technical problems as *very disruptive*, and one teacher (6%) characterizes them as *not too disruptive*.

The technical problems respondents describe are: 1.) an absence of picture or sound, 2.) camera or other equipment malfunctions, 3.) static noises or other interference, or 4.) an inability to connect to one or more remote sites. Some teachers explain that their own inexperience or inadequate training contributed to the technical problems in their classes. Technical problems in ATM classrooms are usually caused by human error, equipment malfunctioning at the offering or receiving sites, and problems with the telecommunications system itself.

Technical Support

The majority (56%) of teachers rate the technical support provided by local support staff very effective, and one-half rate technical support from the network help desk very effective, as shown in the table below.

Rating of Technical Support Received	Number of Respondents	
	Number of Respondents	Percent
From Local Support Staff		
Very effective	9	56%
Somewhat effective	6	38%
Not too effective	1	6%
Not at all effective	0	0
From Network Help Desk		
Very effective	7	50%
Somewhat effective	6	43%
Not too effective	1	7%
Not at all effective	0	0

Advantages and Disadvantages of ATM for Students

The survey asked teachers for their opinions on the advantages and disadvantages of ATM for students. Nearly all survey respondents (94%) mention access to more courses as the main advantage of distance learning for students. Three teachers (19% of respondents) also mention the opportunity to interact with students from other schools and/or regions of Maine as an advantage. One respondent describes the advantages of ATM for students as follows: "Receiving students gain access to a course they otherwise would not get. Students from the sending school get to interact with students from other schools."

Eleven teachers (69% of respondents) consider the lack of personal contact and interaction with the teacher to be the main disadvantage of ATM for students. Two teachers also mention less interaction with classmates as a disadvantage, and three teachers each cited one additional disadvantage: 1.) it is more difficult to do group work with other students, 2.) scheduling differences can cause problems, and 3.) technical difficulties can interfere with learning.

Advantages and Disadvantages of ATM for Teachers

Similarly, teachers were asked to describe the main advantages and disadvantages of ATM for teachers. Five survey respondents (31%) see teaching via ATM as an opportunity to learn new technologies and/or new teaching skills. Four respondents (25%) identify the opportunity to interact with more students as an advantage, and one says that ATM presents the opportunity to teach courses that might not otherwise be offered. Two teachers do not think that ATM offers any advantages for teachers. One teacher says, “It helps to broaden our teaching skills and gives us the ability to see the results of what our colleagues in other schools are accomplishing.” Another educator notes that “teachers develop skills that will be necessary in the future of education. I believe this will be a common approach to teaching and being in the vanguard can be an advantageous position.”

The most commonly identified disadvantage of teaching via ATM, mentioned by seven respondents (44%), is the lack of personal contact with students. Some respondents elaborated on this point by saying that it can be difficult to keep students at remote sites engaged and on task. Four teachers (25%) each mentioned two additional disadvantages of teaching via ATM: 1.) logistical challenges (e.g., schedule conflicts or the flow of paperwork from school to school), and 2.) the additional time and work required (for which teachers generally receive no compensation). Finally, one teacher mentioned technical problems as a disadvantage of teaching via ATM.



Sally Gatehouse, American Sign Language teacher
at the Governor Baxter School for the Deaf

Plans for Next Year

Most respondents (63%) plan to teach the same ATM course(s) next year that they taught this year. Three teachers (19%) report that they will teach at least one new ATM course next year

(two of these will also teach the same course(s) they taught this year). Four respondents (25%) do not plan to teach an ATM course next year, and one teacher is leaving her position.

Teachers were also asked what influenced their decision about teaching via ATM next year. Two teachers do not plan to teach ATM courses next year because their course is not scheduled every year. Another teacher says that there were too many students in her class and not enough support from the school administration. A fourth teacher says that scheduling problems will prevent her from teaching an ATM course next year.

One teacher who plans to teach a new ATM course says, "I enjoy teaching through this technology. Now that I have some experience with the equipment, I hope to improve my teaching skills in this area. I also enjoy developing academic relationships with students from other areas of the state."

Most teachers who expect to teach the same ATM course(s) again next year say that they enjoy teaching via ATM and that they want to offer their course(s) to more students who would otherwise be unable to take it. One teacher says, "I want to improve upon this year's experience," and another notes that "the assistance from our ATM coordinator allows me to enjoy the ATM teaching experience."

Support from School and Receiving Sites

Teachers were asked to rate the level of support for ATM classes both at their own school and at the receiving schools. In rating their own schools, 73% of respondents say that their school is *very supportive*, 20% consider their school *somewhat supportive*, and 7% (one respondent) consider the school *not too supportive*. Three-quarters of respondents rate the receiving sites for their ATM courses *very supportive*, and 25% consider them to be *somewhat supportive*. No teachers deem their school or the receiving site(s) to be *not at all supportive*. One teacher notes that "receiving sites like the concept very much, and it's cheaper than paying a full salary." Another says, "We had two schools drop out because those schools did not support the students, through scheduling conflicts and/or communication problems within their own ATM room usage."

Compensation for ATM Teachers

Only three respondents (19%) report that they receive compensation for teaching via ATM, and the other 13 (81%) report that they do not receive any extra compensation or benefits for teaching via ATM. Of those who do receive compensation, two received a only stipend from the Gates grant, and one receives "\$1,500 from each off-site school for each course."

Teachers' Suggestions for Increasing Support of ATM

The survey asked what could be done to better support teaching via ATM. Five respondents suggest that teachers should receive some form of compensation for teaching ATM courses, mainly as compensation for the extra time and work required. Two teachers suggest that ATM students in each receiving classroom need a class monitor or facilitator on-site, and one

respondent mentioned that “when contact is lost...a facilitator can redirect the students to go over homework or study while waiting for the help desk to bring the problem under control.” Other suggestions include: 1.) preventing or resolving technical problems more quickly, 2.) offering options to enhance the technology, and 3.) holding workshops or meetings for ATM teachers. One teacher suggests that “it would be nice if receiving sites could receive two video outputs at the same time—i.e., document camera and teacher camera.”

Additional Suggestions from Teachers

Finally, teachers were asked for any additional ideas they have for improving distance learning via ATM. Suggestions include: 1.) establishing a common schedule for all schools with ATM, 2.) integrating laptop computers into the ATM system, 3.) providing ATM technology to more schools, and 4.) giving schools incentives to offer ATM courses. One teacher says, “Use it more! We need to improve or update machines, such as DVD players, remote controls for teachers, wide lenses for student cameras, fax machines in ATM rooms, etc.”

Summary

The survey results suggest that the primary benefits of distance learning via ATM are:

- ◆ Students gain access to courses they would not otherwise be able to take.
- ◆ ATM creates opportunities for students and teachers to interact with peers and colleagues from other schools and regions in Maine.
- ◆ Teachers gain new skills and use more technologies and audio-visual media to present material.

Drawbacks of ATM identified by teachers include:

- ◆ Some teachers feel that they do more direct instruction and are less likely to make connections with individual students in ATM classes.
- ◆ There is less personal contact among students or between the teacher and students in ATM classes.
- ◆ There have been some technical problems in ATM classes¹.

The survey results suggest several ways to improve distance learning via ATM, including:

- ◆ Coordinating schedules and calendars across schools.
- ◆ Reducing technical problems and failures.
- ◆ Offering more training to teachers and local support staff (although it appears that many current ATM teachers have not participated in the full series of ATM training that DOE offers).

¹ DOE reports that every ATM site received a complete audio upgrade this summer, which should address some of the technical problems that sites have experienced.

IV. Ensuring Effective Implementation

With the addition of six new ATM sites that were completed earlier this year, the distance-learning network is now fully deployed. But there are several issues that must be addressed before the promise of distance learning can be fully realized and reach as many Maine students as possible.

Training for Teachers and Support Staff

The partners in the Maine Distance Learning Project and school administrators must collaborate to ensure that ATM teachers and support staff take advantage of all available training opportunities. As described earlier in this report, the Department of Education provides an array of training sessions for ATM teachers and support staff. Beyond offering training in the technical aspects of teaching via ATM, additional training is also available to help teachers adapt course materials and make their ATM courses more interactive. UNET also offers site visits to both demonstrate ATM capabilities and to assist teachers in developing effective instructional strategies. The results of our teacher survey indicate that many current ATM teachers have not completed all available training. This factor likely contributes to teachers using more direct instruction in their ATM classes than in traditional classrooms and to reports of technical problems in ATM classes. In reviewing an earlier draft of this report, DOE staff noted the need for an increased emphasis on student interaction and on integrating opportunities for students to present their work during ATM training sessions for educators.

High schools must ensure that a dedicated and trained support person is assigned to each ATM classroom. The teachers we surveyed report that a competent technical-support person, in both receiving and sending ATM classrooms, is essential. Many successful schools have assigned an Ed Tech to this position.

Support and Collaboration among High School Principals

The level of support from a school's principal can make or break a successful ATM course-sharing program. When principals from different schools work together, they can develop coherent strategies for sharing courses via ATM—as the Penquis Valley Region schools have done. Principals can alleviate scheduling conflicts, ensure that student recruitment receives priority, encourage teachers to offer courses, and provide teachers with the support they need to teach successfully via ATM. Principals can also make allowances in teachers' schedules, when appropriate, to compensate for the additional time it takes to teach ATM courses or for ATM training.

Course Offerings from More Schools—Particularly Large Schools—Equipped with ATM

In order for more students to take advantage of distance learning via ATM, more courses must be offered by more schools. The Maine Distance Learning Project has been working to encourage more schools to offer ATM courses. Large schools in particular have the resources—including more teachers and students—to offer courses via ATM. Several schools currently offering ATM courses have become focus sites for a particular foreign language, such as Japanese, which has

been beneficial for both the offering and receiving schools. By offering one or more sections of an advanced or specialized course via ATM, a school will not only be able to make the course available to students at other schools, but may also provide a more flexible and accommodating course schedule for its own students. More classes mean greater access for all students, not just students at receiving schools.

Expand Educator Professional Development Opportunities Offered via ATM

Distance learning via ATM also has the potential to provide more professional-development opportunities to Maine educators and to reduce the overall expense of professional training. ATM offers an accessible means for educators to participate in courses, seminars, and meetings with colleagues from around the state without having to leave their own school, or without having to travel farther than a nearby ATM-equipped site. The ATM network will reduce the costs and time investments normally associated with these kinds of professional-development opportunities. Greater accessibility and convenience is likely to make additional training a more attractive option for educators. The University of Maine currently offers a variety of graduate-level education courses via ATM to high schools around Maine. As Principal Steve MacDougall of Hall-Dale High School expresses it: “We have not even begun to tap the potential of what ATM can offer our teachers—that is the next frontier.”

Profile #3: Forest Hills Consolidated School

Forest Hills Consolidated School in Jackman became one of the newest ATM sites when it received its equipment in July 2004. The geographically-isolated school enrolls nearly 200 students in grades K-12, including about 70 high school students.

All K-12 staff have received introductory ATM training, and several teachers participated in advanced training. Forest Hills will also receive graduate and undergraduate courses and specialized training sessions for teachers via ATM from the University of Maine.

This fall, Forest Hills is receiving AP Calculus, AP Statistics, and Precalculus via ATM from Carrabec High School, and two of its teachers are preparing to broadcast AP French and AP Government via ATM next year. Forest Hills is also using ATM for its speech-pathology program. Virtual field

trips, guest speakers, and special events for K-12 students are planned for 2004-2005.

Principal Richard Curtis says, “We would not be able to offer the higher-level math courses without ATM. Because of ATM, our youngsters can now get speech therapy at school, rather than having to travel 50 miles to Bingham. And ATM is being used a great deal by our community.”



Forest Hills Consolidated School

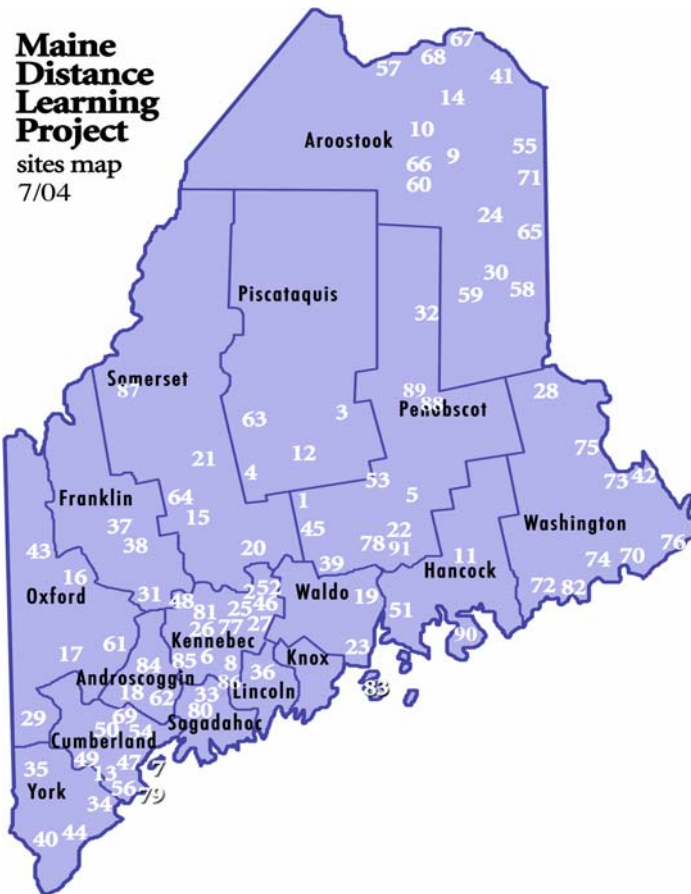
Appendix 1: ATM Distance-Learning Sites, July 2004

Sites	Location	Map Number
High Schools		
Ashland High School	Ashland	60
Bangor High School	Bangor	78
Belfast Area High School	Belfast	23
Bonny Eagle High School	Standish	49
Buckfield JR/High School	Buckfield	61
Bucksport High School	Bucksport	51
Calais High School	Calais	73
Cape Elizabeth High School	Cape Elizabeth	56
Carrabec High School	North Anson	64
Central Aroostook Junior/Senior High School	Mars Hill	24
Cony High School	Augusta	25
Dexter Regional High School	Dexter	1
East Grand School	Danforth	28
Easton High School	Easton	71
Edward Little High School	Auburn	84
Ellsworth High School	Ellsworth	11
Erskine Academy	South China	27
Falmouth High School	Falmouth	54
Forest Hills Consolidated School*	Jackman	87
Fort Fairfield MS/High School	Fort Fairfield	55
Fort Kent Community High School	Fort Kent	57
Foxcroft Academy	Dover-Foxcroft	12
Gardiner Area High School	Gardiner	6
Gorham High School	Gorham	13
Gray-New Gloucester High School	Gray	69
Greeley High School	Cumberland	50
Greenville High School	Greenville	63
Hall-Dale High School	Hallowell	8
Hampden Academy*	Hampden	91
Hodgdon High School	Hodgdon	65
Houlton High School	Houlton	30
Jay High School	Jay	31
Jonesport-Beals High School	Jonesport	82
Katahdin High School	Sherman Station	32
Lawrence High School	Fairfield	52
Limestone Community School/MSSM	Limestone	14
Lewiston High School	Lewiston	62
Lubec Consolidated School	Lubec	76
Machias Memorial High School	Machias	74

Sites	Location	Map Number
Madawaska High School	Madawaska	67
Madison High School	Madison	15
Maranacook Community High School	Readfield	48
Massabesic High School	Waterboro	35
Mattanawcook Academy*	Lincoln	89
Medomak Valley High School	Waldoboro	36
Messalonskee High School	Oakland	77
Morse High School	Bath	33
Mount Abram Regional High School	Strong	37
Mount Ararat High School	Topsham	80
Mount Blue High School	Farmington	38
Mount Desert Island High School*	Mount Desert	90
Mountain Valley High School	Rumford	16
Narraguagus High School	Narraguagus	72
Nokomis Regional High School	Newport	39
Oxford Hills Comprehensive High School	Oxford	17
Penquis Valley High School	Milo	3
Piscataquis Community High School	Guilford	4
Poland Regional High School	Poland	18
Presque Isle High School	Presque Isle	9
Southern Aroostook High School	Island Falls	59
Sacopee Valley JR/High School	Hiram	29
Sanford High School	Sanford	40
Searsport High School	Searsport	19
Shed High School	Eastport	42
Skowhegan Area High School	Skowhegan	20
South Portland High School	South Portland	79
Telstar High School	Bethel	43
Thornton Academy	Saco	44
Upper Kennebec Valley High School	Bingham	21
Van Buren District Secondary School	Van Buren	41
Vinalhaven School	Vinalhaven	83
Washburn District High School	Washburn	66
Washington Academy	East Machias	70
Waterville High School	Waterville	46
Winthrop High School	Winthrop	85
Wiscasset High School*	Wiscasset	86
Wisdom High School	St. Agatha	68
Woodland High School	Baileyville	75
Yarmouth High School	Yarmouth	47
Vocational Tech Centers/Regions		
Capitol Area Tech Center	Augusta	81

Sites	Location	Map Number
Caribou Tech Center	Caribou	10
Northern Penobscot Tech Region III*	Lincoln	88
Southern Aroostook Tech Center	Island Falls	58
Tri County Tech Center	Dexter	45
State Youth Development Centers		
Long Creek Youth Development Center	South Portland	34
Mount View Youth Development Center	Charleston	53
Other Sites		
Bangor Public Library	Bangor	22
Department of Education, Cross Building	Augusta	26
Governor Baxter School for the Deaf	Portland	7
Maine State Library	Augusta	2
University of Maine (Shibles Hall)	Orono	5

*New site added for fall 2004



ATM at Great Maine Schools Project (GMSP) Grantee Schools

Of the 34 high schools receiving GMSP funding, 21 are equipped with ATM. Of these 21 schools, 15 used ATM for at least one high school course this academic year (see table below). The other six schools have used ATM in the past or are planning to use it for the 2004-2005 school year.

ATM Use¹ among GMSP Grantee Schools, 2003-2004

School	Offering ATM Course(s)	Receiving ATM Course(s)	Not Using ATM ¹
Carrabec High School	✓		
Dexter High School	✓	✓	
East Grand School	✓		
Ellsworth High School		✓	
Forest Hills Community School*			
Fort Kent Community High School			✓
Gardiner Area High School		✓	
Hall-Dale High School	✓	✓	
Jonesport-Beals High School	✓	✓	
Lewiston High School	✓	✓	
Lubec Consolidated School		✓	
Machias Memorial High School	✓		
Mount Abram High School		✓	
Mount Ararat High School			✓
Narraguagus High School			✓
Oxford Hills Comprehensive High School			✓
Piscataquis Community High School	✓	✓	
Poland Regional High School		✓	
Sacopee Valley High School			✓
Searsport High School		✓	
Shed High School	✓	✓	
South Portland High School			✓

¹ For high school courses

* Forest Hills is a newly equipped ATM site for 2004-2005.

The GMSP-funded schools not in the ATM network are: Brewer, Central, Deer Isle-Stonington, Dirigo, Georges Valley, Liberty, Livermore Falls, Noble, Portland, Stearns, Sumner Memorial, and Wells High Schools.

Appendix 2: DOE ATM Distance-Learning Network Usage Report, May 2004

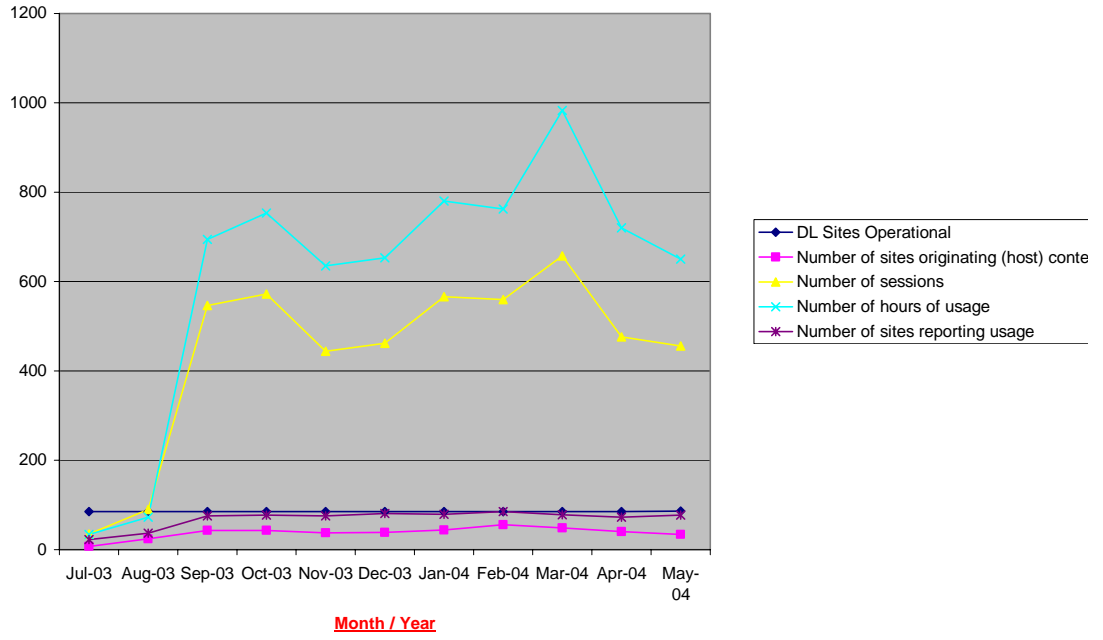
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DOE ATM DL Network Usage Information

- a. DL Sites Operational = 86
- b. Number of sites originating (host) content = 34
- c. Number of sessions = 456
- d. Number of hours of usage = 650
- e. Number of sites reporting usage = 77

Month/Year	DL Sites Operational	Number of Sites Originating (Host) Content	Number of Sessions	Number of Hours of Usage	Number of Sites Reporting Usage
July 2003	85	7	35	34.4	22
August 2003	85	24	90	72.4	37
September 2003	85	43	546	694.6	75
October 2003	85	43	572	753.4	77
November 2003	85	38	444	634.7	75
December 2003	85	39	462	652.7	81
January 2004	85	44	566	780	79
February 2004	85	56	560	762	85
March 2004	85	48	657	983	78
April 2004	85	40	476	720	73
May 2004	86	34	456	650	77

DOE ATM DL Network Usage
Academic Year 2004



DOE ATM DL Network Usage September 2001-May 2004

Month / Year	# Sites Usage	School Days	# Host Sites	Hrs	# Conf	Avg. # Conf / School Day	Avg. # Conf / School Day / Host Site	Avg. # Hours / Conf	Avg. # Hours / Conf / Host Site	Hrs	# Conf	Avg. # Conf / School Day	Avg. # Conf / School Day / Site	Avg Hou / Cc	
Sep-01	33	19	15	160	169	8.9	0.59	0.95	0.06	450	457	24.1	0.7	0.5	
Oct-01	37	22	15	297	225	10.2	0.68	1.32	0.09	841	613	27.9	0.8	1.2	
Nov-01	51	16	27	299	297	18.6	0.69	1.01	0.04	864	892	55.8	1.1	0.5	
Dec-01	54	15	20	239	182	12.1	0.61	1.31	0.07	784	611	40.7	0.8	1.2	
Jan-02	54	22	24	344	257	11.7	0.49	1.34	0.06	1024	719	32.7	0.6	1.4	
Feb-02	52	15	28	312	241	16.1	0.57	1.29	0.05	1021	684	45.6	0.9	1.4	
Mar-02	47	21	30	329	313	14.9	0.50	1.05	0.04	894	832	39.6	0.8	1.0	
Apr-02	53	17	30	323	306	18.0	0.60	1.06	0.04	834	838	49.3	0.9	1.0	
May-02	47	22	24	309	202	9.2	0.38	1.53	0.06	841	544	24.7	0.5	1.5	
Jun-02	42	12	16	138	156	13.0	0.81	0.88	0.06	459	527	43.9	1.0	0.8	
Sep-02	49	23	23	405	250	10.9	0.47	1.62	0.07	1290	760	33.0	0.7	1.7	
Oct-02	58	22	29	534	317	14.4	0.50	1.68	0.06	1382	821	37.3	0.6	1.6	
Nov-02	60	18	28	414	263	14.6	0.52	1.57	0.06	1101	683	37.9	0.6	1.6	
Dec-02	62	15	25	379	262	17.5	0.70	1.45	0.06	1005	681	45.4	0.7	1.4	
Jan-03	72	21	28	480	369	17.6	0.63	1.30	0.05	1269	985	46.9	0.7	1.2	
Feb-03	62	16	37	493	284	17.8	0.48	1.74	0.05	1397	732	45.8	0.7	1.5	
Mar-03	72	21	42	573	399	19.0	0.45	1.44	0.03	1655	1047	49.9	0.7	1.5	
Apr-03	70	17	36	489	300	17.6	0.49	1.63	0.05	1451	830	48.8	0.7	1.7	
May-03	62	21	30	385	275	13.1	0.44	1.40	0.05	1023	723	34.4	0.6	1.4	
Jun-03	60	14	18	243	154	11.0	0.61	1.58	0.09	648	430	30.7	0.5	1.5	
Jul-03	22	0	7	34	35	n/a	n/a	0.97	0.14	91	82	n/a	n/a	1.1	
Aug-03	37	0	24	72	90	n/a	n/a	0.80	0.03	188	211	n/a	n/a	0.8	
Sep-03	75	21	43	695	546	26.0	0.60	1.27	0.03	1987	1432	68.2	0.9	1.2	
Oct-03	77	22	43	753	572	26.0	0.60	1.32	0.03	2102	1540	70.0	0.9	1.2	
Nov-03	75	18	38	625	444	24.7	0.65	1.41	0.04	1749	1212	67.3	0.9	1.4	
Dec-03	81	17	39	653	462	27.2	0.70	1.41	0.04	1889	1287	75.7	0.9	1.4	
Jan-04	79	19	44	780	566	29.8	0.68	1.38	0.03	2211	1578	83.1	1.1	1.4	
Feb-04	85	15	56	762	560	37.3	0.67	1.36	0.02	2257	1598	106.5	1.3	1.4	
Mar-04	85	23	48	983	657	28.6	0.60	1.50	0.03	2710	1766	76.8	0.9	1.5	
Apr-04	73	17	40	720	476	28.0	0.70	1.51	0.04	1922	1246	73.3	1.0	1.5	
May-04	77	20	34	650	456	22.8	0.67	1.43	0.04	1715	1187	59.4	0.8	1.4	

NOTES on DOE ATM DL Network Usage September 2001-May 2004

# Sites Usage	Number DOE DL Sites that Recorded Usage for the Month
School Days	Number of "School Days" in the Month
# Host Sites	Number of Sites "Originating" (Hosting) Content
HOST (The following 6 "monthly" statistics reflect the network usage by sites "originating" content for the month)	
Hours	Number of Hours of Usage
# Conf	Number of Conf Recorded
Avg. # Conf / School Day	Average Number of Conferences per School Day
Avg. # Conf / School Day / Host Site	Average Number of Conferences per School Day per Host Site
Avg. # Hours / Conf	Average Number of Hours per Conference
Avg. # Hours / Conf / Host Site	Average Number of Hours per Conference per Host Site
SITE (The following 6 "monthly" statistics reflect the network usage by "all" sites recording usage for the month)	
Hours	Number of Hours of Usage
# Conf	Number of Conferences Recorded
Avg. # Conf / School Day	Average Number of Conferences per School Day
Avg. # Conf / School Day / Site	Average Number of Conferences per School Day per Site
Avg. # Hours / Conf	Average Number of Hours per Conference
Avg. # Hours / Conf / Site	Average Number of Hours per Conference per Site



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Cover photo: Roland Gilbert, AP Calculus teacher at Dexter Regional High School
All photos by David Patterson—except photo on page 18, courtesy of Forest Hills High School