

UNITED STATES
DEPARTMENT OF EDUCATION



NEWS

FOR EMBARGOED RELEASE: 9 a.m. EDT
October 10, 1995

Contact: Melinda Kitchell Malico
(202) 401-1008

NOTE: Secretary Riley will be available via conference call Tuesday at 11 a.m. and 2 p.m. EDT to talk with reporters about the grants. Call (800) 495-0245, SCHOOLS (724-6657)

PRESIDENT SAYS TECHNOLOGY CHALLENGE GRANTS WILL HELP BUILD 21ST CENTURY SCHOOLS

WASHINGTON, Oct. 10 -- President Clinton today announced the first installment on a five-year commitment to move the nation's schools into the Information Age.

Flanked by Vice President Gore, Education Secretary Richard Riley and corporate leaders, the President announced 19 Challenge Grants for Technology in Education. The awards, totaling \$9.5 million, are going to community partnerships with matching commitments of more than \$70 million in the first year and over \$300 million during the five-year span of the projects.

"Everywhere we look, technology is changing the way we work and live," President Clinton said. "Now, more than ever, it is imperative that our nation's schools have the technology they need to prepare students for the 21st century.

"The recipients of these challenge grants and their partners are committed to developing creative responses to the Information Age requirements of all students, including those in inner cities and rural areas. These grants will support visionary educators, parents, business partners and community leaders who are working to retool their schools for the future."

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The challenge grant partnerships -- local consortia comprised of school districts and 380 partners representing business, education, libraries, museums, the military, states and cities -- will help infuse powerful new technologies into schools, allowing students and teachers to join the information superhighway. The partners have made substantial commitments for equipment, software development, technical support, telecommunications services and other costs.

"Powerful new technologies and the information superhighway can create unparalleled possibilities for extending the time, place and resources for learning," Riley said. "By linking schools to homes, libraries, museums, community centers and the workplace, these partnerships will expand learning opportunities for all students. The challenge grant communities being announced today will make these connections a reality -- and open schools to the abundance of educational resources available around the world."

The 19 grant recipients have formed partnerships with more than 134 other school districts in 23 states in the first year of the grant cycle. The partnerships also include more than 120 businesses, 34 universities and colleges, 10 museums, five libraries, 10 state education departments, education offices in five national and a state park system, two regional education laboratories, an energy laboratory, a Naval base and an Army base, and state and local government offices.

"These communities are responding to an ambitious challenge," Riley said. "Classrooms should be modern information centers for learning, yet most instruction still takes place with black boards and chalk. The implications for education and economic

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competitiveness are enormous. Employers need well-educated employees who can use information technologies to gain knowledge and improve productivity. These grants will help schools and corporate partners make technology a part of effective teaching and learning."

First-year support for the projects comes from both fiscal year 1995 and 1996 funds; the grants announced today are funded with FY 95 funds. The Clinton administration is seeking Congressional support to fully fund the five-year grants at more than \$85 million. Clinton requested \$70 million for FY 96, but the House has recommended just \$25 million and the Senate is considering funding of \$15 million.

"At a time when hundreds of communities across the country are expressing their desire to meet the challenge of bringing their schools into the information age, it is tragic that Congress is considering cuts in this program, which would provide the resources they need for an effective response," Riley said. "Each federal dollar committed to this program is generating over \$3 of additional local community investment in the future of our children. This is an investment in education and our future economic competitiveness that should not be lost."

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NOTE TO EDITORS: Attached is a list of grantees.

FY 1995 CHALLENGE GRANTS FOR TECHNOLOGY IN EDUCATION

CALIFORNIA

Redwood City	San Mateo County Office of Education Contact: Joe Becerra (415) 802-5444	\$550,000
San Diego	San Diego Unified School District Contact: Richard Fabian (619) 225-3416	510,241

DELAWARE

Dover	Capital School District Contact: William McGlumphy (302) 672-1521	550,000
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ILLINOIS

Waukegan	Waukegan Community Unit School District 60 Contact: Elaine Armani (708) 360-5440	500,000
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INDIANA

Anderson	Anderson Community School Corporation Contact: Terri Austin (317) 641-2151	300,000
Indianapolis	Indianapolis Public Schools Contact: John Kern (317) 226-4122	500,000

LOUISIANA

Natchitoches	Natchitoches Parish School Board Contact: Kerry Davidson (504) 342-4253	500,000
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MARYLAND

Baltimore	Baltimore City Public Schools Contact: Michael Pitroff (410) 396-7607	624,712
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MICHIGAN

White Cloud	Newaygo County Intermediate School District Contact: Larry Ivens (616) 924-0380	580,000
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NEBRASKA

Omaha	Westside Community Schools Contact: Susan Manuel (402) 390-2124	412,500
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NEW HAMPSHIRE

Manchester	Manchester School District Contact: Terry Bullard (603) 624-6300	500,000
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NEW MEXICO

Laguna	Pueblo of Laguna Department of Education Contact: Gilbert Sanchez (505) 552-6008	\$557,779
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OHIO

Cuyahoga Falls	Summit County Office of Education Contacts: Steve Snyder / Gaye Fawcett (216) 945-5600	585,000
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PENNSYLVANIA

Philadelphia	School District of Philadelphia Contact: Steven Guttentag (215) 299-4670	959,000
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Towanda	Towanda Area School District Contact: Daniel Paul (717) 265-9894	462,107
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SOUTH DAKOTA

Sturgis	Black Hills Special Services Cooperative Contact: Jim Parry (605) 394-1876	310,000
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TEXAS

El Paso	Socorro Independent School District Contact: Ben DeBlis (915) 860-3438	342,500
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UTAH

Price	Southeast Education Service Center Contact: F. Lynn Bills (801) 637-1173	333,999
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VERMONT

Montpelier	Montpelier School District Contact: David Gibson (802) 223-6366	329,661
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FOR EMBARGOED RELEASE: 10 a.m. EST
February 8, 1997

Contact: David Thomas
(202) 401-1579

CLINTON, GORE CITE PROGRESS IN WIRING NATION'S SCHOOLS

President Clinton in his weekly radio address today used the first anniversary of the Telecommunications Act to present new data showing the nation is making steady progress toward the goal of connecting all schools to the "information superhighway" by the year 2000.

According to a survey by the U.S. Department of Education's National Center for Education Statistics, the number of schools connected to the Internet has nearly doubled and the number of classrooms has more than quadrupled since 1994.

"We are making a lot of progress," Clinton said. According to the data, 65 percent of America's schools are now connected to the Internet. "That's almost double the number of schools connected in 1994," Clinton said. "But it is not enough to connect every school; we must connect every classroom and library as well. Since 1994, we have more than quadrupled the number of classrooms with a direct link to the Internet. But the vast majority still do not have access."

The data showed that the number of classrooms, computer labs and media centers with access to the Internet has increased from three percent in 1994 to 14 percent in 1996.

"That's good progress, but we have a long way to go," said Vice President Al Gore. "That's why I'm happy to announce today on the Telecommunications Act's one-year anniversary, the Department of Education is awarding a total of \$14.3 billion to three states -- Illinois, Mississippi, and New Mexico -- the very first of a total of \$200 million in Technology

Literacy Challenge grants. Communities will use these funds to equip classrooms with computers, link schools to the Internet, and train teachers in new information technologies."

"The Telecommunications Act of 1996 can help us in a major way by getting all schools and more classrooms on-line and helping the highest poverty schools receive the largest discount on connecting classrooms to the Internet," said U.S. Secretary of Education Richard W. Riley.

"The bipartisan recommendations by the Federal Communications Commission's Federal/State Joint Board are truly momentous. They will ensure that all schools and libraries have affordable access to advanced telecommunications, with deep discounts for schools in low-income and high-cost areas."

Riley noted that the recommendations would enable almost 70 percent of all schools to get at least a 50 percent discount on a wide range of telecommunications services, including Internet access and the connections to the classrooms.

While the number of schools and classrooms with access to the Internet continues to increase, Riley cautioned that our efforts ~~to improve~~ teaching and learning must extend to all schools and classrooms. The survey showed that only half of the schools serving high numbers of poor students were connected, while about three-fourths of the schools serving more affluent students had Internet access.

Riley said we are beginning to address this problem through the president's Technology Literacy Challenge Fund and other initiatives. Clinton has doubled his funding request -- \$500 million -- for education technology initiatives for fiscal 1998.

"It's also imperative that teachers and administrators be on the front line to help us excel in this information era," Riley said. In 1996, the survey showed that only 20 percent of teachers used advanced telecommunications for teaching.

The survey was sent to a nationally representative sample of more than 900 public elementary and secondary schools in fall 1996. Data were collected on the prevalence of Internet access, the types of Internet capabilities schools make available, use of advanced telecommunications by schools and teachers, and sources of support for advanced telecommunications in schools.

Of the 65 percent of public schools with Internet access:

- o Ninety percent had e-mail, 89 percent had World Wide Web access, and 57 percent could access news groups;
- o Twenty-five percent could connect to the Internet from five or more instructional rooms;
- o Among schools with World Wide Access, 94 percent made it available to teachers, 86 made it available to administrative staff, and 74 percent made it available to students;
- o Sixty-seven percent had access to resource location services (such as Archie, Gopher, Veronica, etc.).

The findings are reported in "Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996," which is a follow-up to similar surveys conducted in 1994 and 1995.

Other findings from the survey include:

- o The number of schools with access to the Internet has increased by 15 percentage points for the second consecutive year;
- o Eighty-seven percent of the schools without access to the Internet have plans to obtain access by the year 2000, thus 95 percent of the nation's public schools expect to be connected by the turn of the century;
- o Teacher training in advanced telecommunications was mandated by the school or district or required by teacher certification agencies in 13 percent of the schools, while in about half of the schools it was left up to teachers to initiate participation;

- o Nearly three-fourths of schools used advanced telecommunications (including but not limited to the Internet) to access information; 67 percent used it for record keeping within schools or school districts; and
- o Twenty percent of teachers used advanced telecommunications for teaching, 16 percent for professional development, and 15 percent for curriculum development.

Single, printed copies of the report will be available in mid-March by calling 1 (800) 424-1616 or (202) 219-1513. Call the GPO Order Desk at (202) 512-1800 to order multiple copies.

Currently, single copies of the report are available by calling (202) 219-1677.

The report is accessible at the Internet address:

<http://www.ed.gov/NCES/pubs/97944.html>.

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Author: Julie Kaminkow at WDCB02
Date: 2/11/97 9:32 AM
Priority: Normal
TO: William Kincaid at WDCT01
Subject: Re: technology report

----- Message Contents -----

Thanks. I got one from Emilio.

Bill

We have a few up here but if people are requesting reports send them
to 1-800-424-1616 or 219-1513 or on-line at
www.ed.gov/NCES/pubs/97944.html

Reply Separator

Subject: technology report
Author: William Kincaid at WDCT01
Date: 2/11/97 08:50 AM

Julie--

Do you have any extra copies of the technology report that was
released Saturday?

Thanks.

-- Bill

NATIONAL CENTER FOR EDUCATION STATISTICS

Statistics in Brief

February 1997

Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996

Contact:
Shelley Burns
(202) 219-1463

Authors:
Sheila Heaviside
Toija Riggins
Elizabeth Farris
Westat, Inc.

The *Survey of Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996* requested information regarding the availability and use of advanced telecommunications in regular public schools and, in particular, access to the Internet, plans to obtain Internet access, use of advanced telecommunications by schools and teachers, and sources of support for advanced telecommunications in schools. Major findings of the survey are as follows:

- Sixty-five percent of U.S. public schools had access to the Internet in fall 1996 (table 1). This represented a gain of 15 percentage points in each of the last two consecutive years.
- While 61 percent of all public elementary schools had Internet access, about three-fourths (77 percent) of secondary schools had Internet access (table 1).
- Large schools were more likely to have Internet capabilities than their smaller counterparts. Eighty percent of public schools with 1,000 or more students had Internet access compared with 57 percent of schools with fewer than 300 students and 66 percent of schools enrolling between 300 and 999 students (table 1).
- Urban fringe (or suburban) schools reported higher rates of Internet access than schools in rural locales or towns. Seventy-five percent of urban fringe schools were connected to the Internet, compared with 60 percent for rural schools and 61 percent for schools in towns (table 1).
- Public schools with high levels of students in poverty were less likely to be connected to the Internet. Internet access was available in about half (53 percent) of schools in which 71 percent or more students were eligible for the free or reduced-price lunch program and in 58 percent of those in which 31 to 70 percent of students were eligible.

In comparison, 72 percent of schools with 11 to 30 percent student eligibility for the lunch program had Internet access and 78 percent of those with less than 11 percent free or reduced-price lunch eligibility were connected to the Internet (table 1).

- Eighty-seven percent of public schools that did not have access to the Internet had plans to obtain access by the year 2000 (table 2). Thus, 95 percent of the nation's public schools were expecting to obtain Internet access by the end of the century (figure 3).
- In fall 1996, 14 percent of all public school instructional rooms (classrooms, computer or other labs, and library media centers) were connected to the Internet (table 1). This was more than a fourfold increase since fall 1994, when 3 percent of all instructional rooms had access to the Internet.
- In 5 percent of public schools on the Internet, Internet access capabilities were not installed in instructional rooms (including classrooms, computer or other labs, and library media centers). Forty-three percent of schools with Internet access provided this access in one instructional room (figure 2). Twenty-two percent had access in two or three rooms, 4 percent reported four rooms, and 25 percent were connected to the Internet in five or more instructional rooms.
- Among all public schools, 20 percent of teachers used advanced telecommunications for teaching (table 5).
- Thirteen percent of all public schools reported that training for teachers in advanced telecommunications was mandated by the school, district, or teacher certification agencies (table 6). Thirty-one percent of schools indicated that incentives were provided to encourage teachers to obtain advanced telecommunications training, while in about half (51 percent) of the nation's public schools it was left up to teachers to

initiate participation in advanced telecommunications training.

- Support for advanced telecommunications in all public schools was most frequently provided by local school districts. Eighty-three percent of public schools reported that the school district provided funds for advanced telecommunications (table 7). Funds from state or federal government agencies helped support advanced telecommunications in 38 percent of public schools, and 18 percent reported that parents or other community members provided monetary support for the schools' advanced telecommunications.

The National Information Infrastructure (NII) initiative, set forth by the President, encourages an acceleration of the goal to connect all of the nation's schools and classrooms, as well as libraries, hospitals, and law enforcement agencies, to the "Information Superhighway." In response to this federal goal, the U.S. Department of Education has commissioned three surveys to obtain data on the status of advanced telecommunications in public elementary and secondary schools. The first obtained baseline data in fall 1994 against which future change could be measured. A followup survey was conducted in fall 1995 and because the status of advanced telecommunications is changing rapidly, a third study, the *Survey of Advanced Telecommunications in U.S. Public Schools, Fall 1996*, was conducted for the National Center for Education Statistics (NCES) through its Fast Response Survey System (FRSS).

This report presents selected data from the fall 1996 survey; the data were collected from 911 regular public elementary and secondary schools and were weighted to produce national estimates for all regular public schools. Special education, vocational education, and alternative schools were not included in the study. Data presented include the prevalence of Internet access in public schools, the types of Internet capabilities schools make available, use of

advanced telecommunications by schools and teachers, and sources of support for advanced telecommunications in schools. Future reports will provide additional study findings, including barriers to the use of advanced telecommunications for students with disabilities.

Internet Access in Schools

Overall, 65 percent of public schools had Internet access during fall 1996 (table 1). This number represents all schools that had any access to the Internet.

Table 1.--Percent of all public schools and the percent of all public school instructional rooms with Internet access in fall 1994, fall 1995, and fall 1996, by school characteristics

School characteristic	Percent of schools with Internet access			Percent of instructional rooms with Internet access ¹		
	1994	1995	1996	1994	1995 ²	1996
All public schools.....	35	50	65	3	8	14
Instructional level ³						
Elementary	30	46	61	3	8	13
Secondary	49	65	77	4	8	16
Size of enrollment						
Less than 300.....	30	39	57	3	9	15
300 to 999.....	35	52	66	3	8	13
1,000 or more	58	69	80	3	4	16
Metropolitan status						
City	40	47	64	4	6	12
Urban fringe	38	59	75	4	8	16
Town	29	47	61	3	8	14
Rural.....	35	48	60	3	8	14
Geographic region						
Northeast	34	59	70	3	6	10
Southeast	29	44	62	2	5	10
Central	34	52	66	3	10	19
West.....	42	48	62	5	9	15
Percent minority enrollment						
Less than 6 percent.....	*	52	65	*	9	18
6 to 20 percent.....	*	58	72	*	10	18
21 to 49 percent.....	*	54	65	*	9	12
50 percent or more.....	*	40	56	*	3	5
Percent of students eligible for free or reduced-price school lunch						
Less than 11 percent.....	*	62	78	*	9	18
11 to 30 percent.....	*	59	72	*	10	16
31 to 70 percent.....	*	47	58	*	7	14
71 percent or more.....	*	31	53	*	3	7

*Data not available.

¹The percent of instructional rooms across the country is based upon the total number of instructional rooms (e.g., classrooms, computer labs, library/media centers) in all regular public elementary and secondary schools.

²Data for the percentage of all instructional rooms across the country with Internet access in 1995 was previously reported as 9 percent. Subsequent checking found that the correct number for 1995 is 8 percent.

³Data for combined schools are not reported as a separate instructional level because there were very few in the sample. Data for combined schools are included in the totals and in analyses by other school characteristics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Advanced Telecommunications in Public Schools, K-12," FRSS 51, NCES 95-731; "Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995," FRSS 57, NCES 96-854; "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

School access to the Internet has increased by 15 percentage points for the second consecutive year. In 1994, when data were first collected, 35 percent of public schools were connected to the Internet (table 1). This increased to 50 percent by 1995 and rose again in 1996 to the current level.

Differences in Internet access in fall 1996 were found among schools by instructional level, size of enrollment, metropolitan status, and poverty level of students' families. While 61 percent of public elementary schools had Internet access, about three-quarters (77 percent) of public secondary schools were connected to the Internet. Schools with enrollments of 1,000 or more students were more likely to be connected to the Internet than their smaller counterparts. Eighty percent of large schools were connected to the Internet, compared with 66 percent of schools enrolling 300 to 999 students and 57 percent of those with fewer than 300 students.

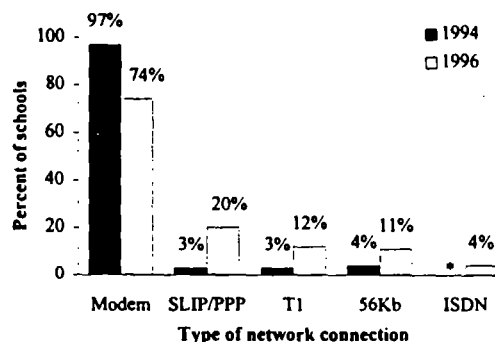
Urban fringe (or suburban) schools reported higher rates of Internet access than those in towns or rural areas. Seventy-five percent of public schools in urban fringe areas had Internet access compared with 61 percent in towns and 60 percent of schools located in rural areas.

School access to the Internet was examined by the level of poverty in the school as defined by the proportion of students eligible for the free or reduced-price lunch program. Schools with higher proportions of students eligible for the free or reduced-price lunch program were less likely to have Internet access than those with smaller percentages of students eligible for this program. About half (53 percent) of schools in which 71 percent or more students were eligible for the free or reduced-price lunch program had Internet access and 58 percent of those schools with 31 to 70 percent of eligible students had

Internet access. In comparison, about three-fourths (72 to 78 percent) of schools with smaller proportions of students eligible for free or reduced-price lunch had Internet access.

Schools connect to the Internet in a variety of ways. Although modems remained the most common means of connection, use of higher speed connections had increased since 1994. In fall 1996, 74 percent of schools with Internet were connected by modem (figure 1). Twenty percent used higher speed SLIP or PPP connections, 12 percent had a T1 connection, 11 percent had a 56Kb connection, and 4 percent connected to the Internet with an ISDN. This represents a change from 1994 when data were first collected. In 1994, 97 percent of schools with Internet connected by modem; 3 to 4 percent used each type of high speed connection such as a SLIP/PPP (3 percent), T1 (3 percent), or 56Kb (4 percent), or ISDN (4 percent).

Figure 1.—Percent of public schools with Internet access, by type of network connection: Fall 1996



*Data not collected in 1994.

NOTE: The percents of public schools with each type of connection are based upon schools with Internet access--65 percent of public schools in 1996 and 35 percent of public schools in 1994. Percents do not sum to 100 because some schools had more than one type of connection.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Internet Access in Instructional Rooms

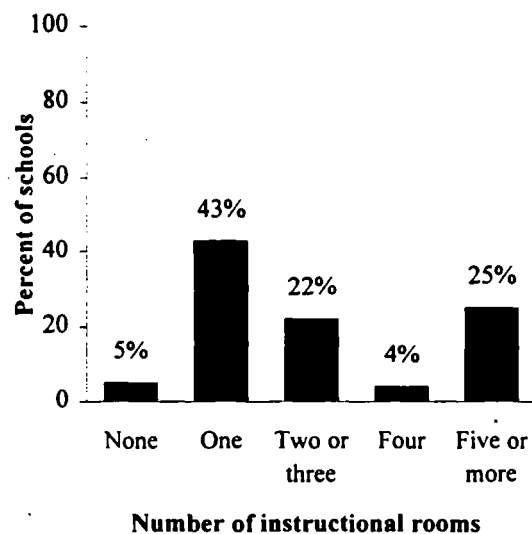
In addition to Internet access at the school building level, the survey collected information regarding the percentage of instructional rooms including classrooms, computer or other labs, school libraries, and media centers that had Internet access. Overall, while 65 percent of schools were on the Internet, 14 percent of all instructional rooms in U.S. public schools had Internet access. This percentage has grown by 5 to 6 percentage points annually since fall 1994 when 3 percent of instructional rooms were on the Internet (table 1).

The percentage of rooms with Internet access differed by percent minority enrollment and poverty of the school. While schools with minority enrollments of 20 percent or less reported Internet access in 18 percent of their instructional rooms, those with minority enrollments of 50 percent or more had access in 5 percent of their instructional rooms. Instructional rooms in schools with the highest level of student poverty (71 percent or more) were about half as likely to have Internet access (7 percent) as schools with lower levels of poverty (14 to 18 percent).

Of the schools with Internet access, 95 percent indicated that they had Internet access in at least one instructional room such as a classroom,

computer or other lab, or library media center (figure 2). Forty-three percent reported access in one instructional room, 22 percent had Internet access in two or three instructional rooms, 4 percent reported access in four instructional rooms, and 25 percent had Internet access in five or more rooms.

Figure 2.—Percent of public schools with Internet access, by the number of instructional rooms with access: Fall 1996



NOTE: Percents do not sum to 100 because of rounding and percents with Internet access in one or more instructional rooms do not sum to 95 because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Future Plans for Internet Access

Among schools that do not currently have Internet access (35 percent of all schools), 87 percent have plans to obtain access to the Internet in the future (table 2). Seventy-four percent of schools either had Internet access or indicated that they planned to obtain Internet access by the end of 1997 (figure 3). All but 5 percent of public schools had or were planning to connect to the Internet by the year 2000.

No significant differences in plans for obtaining Internet access were found by school poverty level. However, schools with larger proportions of students in poverty had lower current levels of Internet connectivity. Proportionately, almost twice as many schools in which over 30 percent of students were eligible for school lunch programs (42 to 47 percent) as schools with lower levels of poverty (22 to 28 percent) did not already have access to the Internet (table 2). Thus, higher proportions of these schools

Table 2.—Percent of public schools that do not currently have access to the Internet and their plans to obtain access to the Internet, by school characteristics: Fall 1996

School characteristic	No current Internet access	Planning Internet access by year 2000 ¹	No plans for future Internet access
All public schools	35	87	13
Instructional level ²			
Elementary	39	85	15
Secondary	23	93	7
Size of enrollment			
Less than 300	43	83	17
300 to 999	34	88	12
1,000 or more	20	87	13
Metropolitan status			
City	36	84	16
Urban fringe	25	87	13
Town	39	88	12
Rural	40	87	13
Geographic region			
Northeast	30	94	6
Southeast	38	90	10
Central	34	77	23
West	38	89	11
Percent minority enrollment			
Less than 6 percent	35	86	14
6 to 20 percent	28	88	12
21 to 49 percent	35	95	5
50 percent or more	44	78	22
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent	22	88	12
11 to 30 percent	28	92	8
31 to 70 percent	42	84	16
71 percent or more	47	85	15

¹Schools reported whether they had plans to obtain access to the Internet. All schools reporting that they did have plans to obtain Internet access planned to obtain access by the year 2000.

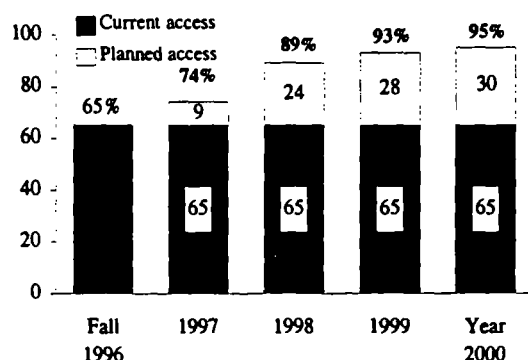
²Data for combined schools are not reported as a separate instructional level because there were very few in the sample. Data for combined schools are included in the totals and in analyses by other school characteristics.

NOTE: The percents of schools with and without plans for future Internet access are based upon schools with no current Internet access—35 percent of public schools.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools. Fall 1996." FRSS 61, 1996.

must become connected if they are to equalize access for students in poverty.

Figure 3.—Percent of all public schools having or expecting Internet access between fall 1996 and the year 2000



SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Type of Internet Capabilities Available

Ninety percent of schools with Internet access had e-mail and 89 percent had access to the World Wide Web (table 3). Ninety-four percent of schools with World Wide Web access made it available to teachers, 86 percent made it

available for administrative staff, and 74 percent made it available to students.

While most schools on the Internet provided teachers and staff access to e-mail, about a third (35 percent) made it available for student use.

Advanced Telecommunications

In addition to information obtained specifically about the Internet, all schools were asked about the use of advanced telecommunications in general. *Advanced telecommunications*, while including the Internet, refers more broadly to all modes of communication used to transmit information from one place to another including broadcast and interactive television, two-way video, and networked computers (both local and wide area networks). With the exception of the Internet, access to other advanced telecommunications capabilities were relatively unchanged since 1994 (unpublished tabulations). Schools provided information about the use of these telecommunications by schools and teachers, training for teachers, and various sources of support for advanced telecommunications in schools.

Table 3.—Percent of public schools having access to the Internet, by various types of Internet capabilities and members of the school community having access to the capability: Fall 1996

Internet capability	Available ¹	Members of school community with access to capability ²		
		Administrative staff	Teachers	Students
E-mail	90	92	88	35
News groups	57	85	91	43
Resource location services (e.g., Gopher, Archie, Veronica, etc.)	67	87	93	64
World Wide Web Access (e.g., browsers, such as Netscape, MOSAIC)	89	86	94	74

¹Percents in this column are based upon the number of schools having access to the Internet—65 percent of public schools.

²Percents in these columns are based upon the number of schools with the corresponding Internet capability.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Uses of Advanced Telecommunications by Schools and Teachers

Seventy-four percent of schools used advanced telecommunications (including but not limited to the Internet) to access information (table 4).

Sixty-seven percent of schools used advanced telecommunications for record keeping within schools or school districts. About one-fifth of schools used advanced telecommunications to communicate with parents or for distance learning (22 percent for each).

Table 4.--Percent of all public schools using advanced telecommunications in selected ways, by school characteristics: Fall 1996

School characteristic	Use of advanced telecommunications ¹			
	To access information	For record keeping within school or school district	To communicate with parents	For distance learning
All public schools.....	74	67	22	22
Instructional level ²				
Elementary	71	66	22	19
Secondary.....	84	68	21	33
Size of enrollment				
Less than 300.....	65	56	19	22
300 to 999.....	76	69	22	21
1,000 or more.....	83	80	29	33
Metropolitan status				
City.....	72	70	26	22
Urban fringe.....	81	71	25	19
Town.....	72	66	23	20
Rural.....	71	60	16	29
Geographic region				
Northeast.....	72	59	18	17
Southeast.....	79	75	27	29
Central.....	77	60	22	22
West.....	69	72	21	22
Percent minority enrollment				
Less than 6 percent.....	74	55	17	23
6 to 20 percent.....	79	72	23	23
21 to 49 percent.....	72	66	27	27
50 percent or more.....	71	78	23	17
Percent of students eligible for free or reduced-price school lunch				
Less than 11 percent.....	78	62	25	25
11 to 30 percent.....	75	62	20	24
31 to 70 percent.....	72	68	21	22
71 percent or more.....	71	77	25	17

¹Advanced telecommunications includes all modes of communications technology used to transmit information from one place to another including local and wide area computer networks (including the Internet); broadcast, cable, and interactive television; one-way video with two-way audio or computer link; two-way video; etc. Advanced telecommunications do not include standard telephone and fax capabilities.

²Data for combined schools are not reported as a separate instructional level because there were very few in the sample. Data for combined schools are included in the totals and in analyses by other school characteristics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Schools also reported the proportions of teachers in the school regularly using any advanced telecommunications for teaching, professional development, or curriculum development. Twenty percent of public school

teachers were using advanced telecommunications for teaching, 16 percent for professional development, and 15 percent for curriculum development (table 5).

Table 5.—Percent of teachers in all public schools regularly using advanced telecommunications for teaching, professional development, and curriculum development, by school characteristics: Fall 1996

School characteristic	Teachers using advanced telecommunications ¹ for:		
	Teaching	Professional development	Curriculum development
All public schools.....	20	16	15
Instructional level ²			
Elementary	22	17	15
Secondary	18	15	14
Size of enrollment			
Less than 300.....	20	15	16
300 to 999.....	22	17	15
1,000 or more	16	14	14
Metropolitan status			
City	18	15	15
Urban fringe	20	17	14
Town	23	16	15
Rural.....	20	17	16
Geographic region			
Northeast	19	16	13
Southeast	23	16	14
Central	19	17	15
West.....	20	15	17
Percent minority enrollment			
Less than 6 percent.....	22	17	16
6 to 20 percent.....	19	15	16
21 to 49 percent.....	21	17	15
50 percent or more.....	19	14	13
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent.....	20	17	16
11 to 30 percent.....	20	16	15
31 to 70 percent.....	22	16	15
71 percent or more.....	20	15	14

¹Advanced telecommunications includes all modes of communications technology used to transmit information from one place to another including local and wide area computer networks (including the Internet); broadcast, cable, and interactive television; one-way video with two-way audio or computer link; two-way video; etc. Advanced telecommunications do not include standard telephone and fax capabilities.

²Data for combined schools are not reported as a separate instructional level because there were very few in the sample. Data for combined schools are included in the totals and in analyses by other school characteristics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

These percentages showed very little variation across school characteristics. Rather, there seemed to be a core of teachers, in very diverse schools, using advanced telecommunications.

Teacher Training

Teacher training in advanced telecommunications was mandated by the school or district or required by teacher certification agencies in 13 percent of schools, while in about half of schools it was left up to teachers to initiate participation in advanced telecommunications training (51 percent; table 6). Thirty-one percent of schools offered incentives to encourage teachers to participate in advanced telecommunications training.

Support for Advanced Telecommunications in Schools

Across various types of support, local school districts were the most frequently reported source of support for advanced telecommunications. In terms of funds, 83 percent of schools indicated that they received funds from the school district, 38 percent obtained funding from state or federal government agencies, and 18 percent reported that parents or other community members supported advanced telecommunications in the school with funds (table 7). Teachers provided advanced telecommunications training in 28 percent of schools and technical assistance in 24 percent of schools.

Summary

Considerable progress has been made in connecting all public schools to the Internet. By fall 1996, 65 percent of all regular public schools were already connected; an additional 30 percent reported that they planned to have Internet access by the year 2000. However, connecting schools is only part of the equation. Although Internet access in instructional rooms in public schools more than quadrupled between fall 1994 and fall 1996 (from 3 percent to 14 percent of all instructional rooms), the actual percentage of instructional rooms with Internet access remains low. Student access to the Internet is another part of the equation, but one about which little is known.

Although the surveys included in this report focused on regular public schools, the National Center for Education Statistics has collected information on Internet access in private schools through a fall 1995 FRSS survey. A report of the findings from that survey will be released shortly. National data regarding Internet access in special types of public schools (special education, vocational education, and alternative schools), however, have not been collected.

In addition to tracking the rate at which schools and instructional rooms have access to the Internet, the *Survey on Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996* gathered data regarding what other kinds of advanced telecommunications are available in schools, types of teacher training in advanced telecommunications provided by schools and school districts, and barriers to the use of schools' advanced telecommunications resources by students with disabilities. These issues will be examined in forthcoming NCES reports, scheduled for release later in 1997.

Table 6.—Percent of all public schools in which advanced telecommunications training for teachers is mandated, encouraged by incentives, left up to teachers to initiate, or described in some other way, by school characteristics: Fall 1996

School characteristic	Advanced telecommunications ¹ training for teachers is:			
	Mandated by school or district or by teacher certification agencies	Encouraged by incentives	Left up to teachers to initiate participation	Other
All public schools.....	13	31	51	4
Instructional level ²				
Elementary	13	31	51	4
Secondary	11	32	53	4
Size of enrollment				
Less than 300.....	11	32	51	7
300 to 999.....	14	31	52	3
1,000 or more	9	34	53	4
Metropolitan status				
City.....	7	30	59	4
Urban fringe	13	39	46	2
Town	19	26	52	3
Rural.....	13	30	50	8
Geographic region				
Northeast	8	37	51	3
Southeast	22	29	45	4
Central.....	11	34	50	5
West.....	11	27	57	5
Percent minority enrollment				
Less than 6 percent.....	11	33	50	5
6 to 20 percent.....	15	35	47	3
21 to 49 percent.....	15	29	52	4
50 percent or more.....	11	26	59	4
Percent of students eligible for free or reduced-price school lunch				
Less than 11 percent.....	14	38	44	5
11 to 30 percent.....	11	39	45	5
31 to 70 percent.....	15	24	58	3
71 percent or more.....	11	29	57	3

¹Advanced telecommunications includes all modes of communications technology used to transmit information from one place to another including local and wide area computer networks (including the Internet); broadcast, cable, and interactive television; one-way video with two-way audio or computer link; two-way video; etc. Advanced telecommunications do not include standard telephone and fax capabilities.

²Data for combined schools are not reported as a separate instructional level because there were very few in the sample. Data for combined schools are included in the totals and in analyses by other school characteristics.

NOTE: Percents may not sum to 100 because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 7.—Percent of all public schools by sources of support for advanced telecommunications in the schools: Fall 1996

Organization	Support for advanced telecommunications*					
	Funds	Hardware	Software	Training	Technical assistance	Network access
School district	83	76	74	76	73	57
College or university	1	2	2	12	6	7
Business or industry	10	13	9	5	7	4
State or federal government agencies	38	18	15	17	12	11
Other community nonprofit organizations (e.g., libraries, museums)	6	4	4	3	3	3
Teachers	6	6	11	28	24	4
Students	1	1	2	3	5	1
Parents or other community members	18	14	11	4	11	1
Other	1	1	1	1	1	1

*Advanced telecommunications includes all modes of communications technology used to transmit information from one place to another including local and wide area computer networks (including the Internet); broadcast, cable, and interactive television; one-way video with two-way audio or computer link; two-way video; etc. Advanced telecommunications do not include standard telephone and fax capabilities.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Technical Notes

The sample of elementary and secondary schools for the FRSS survey on advanced telecommunications was selected from the 1993-94 NCES Common Core of Data (CCD) Public School Universe File. Over 84,000 public schools are contained in the CCD public school universe file. For this survey, elementary and secondary schools were selected. Special education, vocational education, and alternative schools were excluded from the survey along with schools that did not have at least first grade and those outside the 50 states and the District of Columbia.

A stratified sample of 1,000 schools was selected from the public school frame. To select the sample, the frame of schools was stratified by instructional level (elementary, secondary) and by geographic region (Northeast, Southeast, Central, and West). Within these primary strata,

schools were also sorted by metropolitan status (city, urban fringe, town, rural), size of enrollment (less than 300, 300-499, 500-999, 1,000-1,499, 1,500 or more), and percent minority enrollment (less than 5 percent, 5-19.9 percent, 20-49.9 percent, 50 percent or more). The allocation of the sample to the major strata was made in a manner that was expected to be reasonably efficient for national estimates, as well as for estimates for major subclasses.

In September 1996, questionnaires were mailed to the principals in the 1,000 sampled schools. The principal was asked to forward the questionnaire to the computer or technology coordinator or to whomever was most knowledgeable about the availability and use of advanced telecommunications at the school. Telephone followup of nonrespondents was initiated in late October, and data collection was completed in November. Five schools were found to be closed, and a total of 911 schools

completed the survey. Thus, the final response rate was 92 percent (911 of 995 eligible schools).

The survey responses were weighted to produce national estimates. The weights were designed to adjust for the variable probabilities of selection and differential nonresponse. The findings in this report are estimates based on the sample selected and, consequently, are subject to sampling variability. The standard error is a measure of the variability of estimates due to sampling. It indicates the variability of a sample estimate that would be obtained from all possible samples of a given design and size. Standard errors are used as a measure of the precision expected from a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.96 standard errors below to 1.96 standard errors above a particular statistic would include the true population parameter being estimated in about 95 percent of the samples. This is a 95 percent confidence interval. For example, the estimated percentage of public schools with Internet access is 65 percent, and the estimated standard error is 1.8 percent. The 95 percent confidence interval for the statistic extends from $65 - (1.8 \times 1.96)$ to $65 + (1.8 \times 1.96)$, or from 61 to 69 percent. Estimates of standard errors for this report were computed using a technique known as the jackknife replication method. Standard errors for all of the estimates are presented in the tables. All specific statements of comparison made in this report have been tested for statistical significance using chi-square tests and t-tests adjusted for multiple comparisons using the Bonferroni adjustment and are significant at the 95 percent confidence level or better.

The survey estimates are also subject to nonsampling errors that can arise because of nonobservation (nonresponse or noncoverage)

errors, errors of reporting, and errors made in collection of the data. These errors can sometimes bias the data. Nonsampling errors may include such problems as the differences in the respondents' interpretation of the meaning of the questions; memory effects; misrecording of responses; incorrect editing, coding, and data entry; differences related to the particular time the survey was conducted; or errors in data preparation. While general sampling theory can be used in part to determine how to estimate the sampling variability of a statistic, nonsampling errors are not easy to measure and, for measurement purposes, usually require that an experiment be conducted as part of the data collection procedures or that data external to the study be used. To minimize the potential for nonsampling errors, the questionnaire was pretested with public school technology coordinators and other knowledgeable respondents like those who completed the survey. During the design of the survey and the survey pretest, an effort was made to check for consistency of interpretation of questions and to eliminate ambiguous items. The questionnaire and instructions were extensively reviewed by the National Center for Education Statistics. Manual and machine editing of the questionnaire responses were conducted to check the data for accuracy and consistency. Cases with missing or inconsistent items were recontacted by telephone to resolve problems. Data were keyed with 100 percent verification.

The survey was performed under contract with Westat, Inc., using the NCES Fast Response Survey System (FRSS). Westat's Project Director was Elizabeth Farris, and the Survey Manager was Sheila Heaviside. Judi Carpenter, Shelley Burns, and Edith McArthur were the NCES Project Officers. The data were requested by Linda Roberts, U.S. Department of Education.

This report was reviewed by the following individuals:

Outside NCES

- Oona Cheung, Council of Chief State School Officers
- Douglas A. Levin, Pelavin Research Institute/American Institutes for Research
- David Osher, Pelavin Research Institute/American Institutes for Research

Inside NCES

- Michael P. Cohen, Statistical Standards and Services Group
- Mary J. Frase, Data Development and Longitudinal Studies Group
- Gerald S. Malitz, Surveys and Cooperative Systems Group
- William H. Freund, Surveys and Cooperative Systems Group
- Kerry L. Gruber, Surveys and Cooperative Systems Group

For a copy of the questionnaire, *Advanced Telecommunications in U.S. Public Schools, Fall 1996*, or for more information about the Fast Response Survey System, contact Shelley Burns, Data Development and Longitudinal Studies Group, National Center for Education Statistics, Office of Educational Research and Improvement, 555 New Jersey Avenue, NW, Washington, DC 20208-5651, telephone (202) 219-1463. This and other NCES reports are available on the Internet at www.ed.gov/NCES/.

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Advanced Telecommunications in U.S. Public Schools, K-12, FRSS 51, NCES 95-731, Washington, DC: U.S. Government Printing Office.
- U.S. Department of Education. 1996.
Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995, FRSS 57, NCES 96-854, Washington, DC: U.S. Government Printing Office.

Appendix A

Standard Error Tables

Table 1a.--Standard errors of the percent of all public schools and the percent of all public school instructional rooms with Internet access in fall 1994, fall 1995, and fall 1996, by school characteristics

School characteristic	Percent of schools with Internet access			Percent of all instructional rooms with Internet access		
	1994	1995	1996	1994	1995	1996
All public schools.....	1.5	1.8	1.8	0.3	0.7	1.0
Instructional level						
Elementary	1.9	2.4	2.1	0.4	1.0	1.5
Secondary	2.4	2.7	1.8	0.6	1.0	1.5
Size of enrollment						
Less than 300.....	3.4	3.9	4.4	0.7	1.6	2.9
300 to 999.....	2.0	2.2	2.0	0.5	1.0	1.2
1,000 or more	3.0	4.1	3.4	0.6	1.0	2.1
Metropolitan status						
City	3.1	4.3	4.5	0.8	1.3	1.6
Urban fringe	2.9	3.8	3.3	0.8	1.4	2.2
Town	2.3	3.7	4.0	0.6	2.0	1.9
Rural	2.7	3.8	3.3	0.4	1.5	2.2
Geographic region						
Northeast	3.1	5.3	4.3	0.7	1.4	2.4
Southeast	3.1	5.3	4.0	0.3	1.5	1.7
Central	2.8	3.3	3.7	0.8	1.3	2.5
West.....	2.6	3.4	3.5	0.8	1.4	1.8
Percent minority enrollment						
Less than 6 percent.....	*	3.3	3.4	*	1.4	2.4
6 to 20 percent.....	*	4.4	3.0	*	1.5	2.2
21 to 49 percent.....	*	4.0	3.2	*	2.1	2.3
50 percent or more.....	*	3.8	4.6	*	1.0	1.5
Percent of students eligible for free or reduced-price school lunch						
Less than 11 percent.....	*	3.5	3.6	*	1.6	2.9
11 to 30 percent.....	*	3.6	3.1	*	1.8	2.0
31 to 70 percent.....	*	2.9	3.2	*	1.6	1.8
71 percent or more.....	*	4.3	5.2	*	0.9	1.6

*Data not available.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995," FRSS 57, NCES 96-854; "Advanced Telecommunications in Public Schools, K-12," FRSS 51, NCES 95-731; "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 2a.--Standard errors of the percent of public schools that do not currently have access to the Internet and their plans to obtain access to the Internet, by school characteristics: Fall 1996

School characteristic	No current Internet access	Planning Internet access by year 2000	No plans for future Internet access
All public schools.....	1.8	2.1	2.1
Instructional level			
Elementary	2.1	2.5	2.5
Secondary	1.8	2.6	2.6
Size of enrollment			
Less than 300.....	4.4	4.4	4.4
300 to 999.....	2.0	2.5	2.5
1,000 or more	3.4	7.8	7.8
Metropolitan status			
City	4.5	5.4	5.4
Urban fringe	3.3	5.7	5.7
Town	4.0	4.1	4.1
Rural	3.3	4.2	4.2
Geographic region			
Northeast	4.3	4.3	4.3
Southeast	4.0	3.9	3.9
Central	3.7	5.2	5.2
West.....	3.5	3.3	3.3
Percent minority enrollment			
Less than 6 percent.....	3.4	3.8	3.8
6 to 20 percent.....	3.0	5.5	5.5
21 to 49 percent.....	3.2	2.9	2.9
50 percent or more.....	4.6	5.4	5.4
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent	3.6	7.0	7.0
11 to 30 percent	3.1	3.8	3.8
31 to 70 percent	3.2	3.7	3.7
71 percent or more.....	5.2	5.1	5.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 3a.--Standard errors of the percent of public schools having access to the Internet, by various types of Internet capabilities and members of the school community having access to the capability:
Fall 1996

Internet capability	Available	Members of school community with access to capability		
		Administrative staff	Teachers	Students
E-mail	1.3	1.2	1.7	2.2
News groups	2.1	2.0	1.5	2.7
Resource location services (e.g., Gopher, Archie, Veronica, etc.)	2.4	1.6	1.3	2.4
World Wide Web Access (e.g., browsers, such as Netscape, MOSAIC).....	1.6	1.4	1.2	2.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 4a.--Standard errors of the percent of all public schools using advanced telecommunications in selected ways, by school characteristics: Fall 1996

School characteristic	Use of advanced telecommunications			
	To access information	Record keeping within school or school district	To communicate with parents	For distance learning
All public schools.....	1.5	1.7	1.3	1.6
Instructional level				
Elementary	1.8	2.1	1.8	1.8
Secondary	1.8	2.1	1.8	3.0
Size of enrollment				
Less than 300.....	4.0	4.1	3.4	3.3
300 to 999.....	1.7	1.9	1.9	1.8
1,000 or more	2.9	3.4	3.7	4.0
Metropolitan status				
City.....	3.2	4.0	2.7	2.7
Urban fringe	2.9	3.4	2.9	3.2
Town	3.5	3.6	3.0	2.6
Rural.....	3.7	3.4	2.7	3.6
Geographic region				
Northeast	3.5	4.3	3.3	3.3
Southeast	3.2	3.4	3.4	3.7
Central	3.1	3.3	2.5	2.6
West.....	3.2	2.8	2.7	2.8
Percent minority enrollment				
Less than 6 percent	3.2	3.3	2.6	3.1
6 to 20 percent.....	3.1	3.4	2.9	3.2
21 to 49 percent.....	4.2	3.5	3.7	2.8
50 percent or more.....	3.5	3.4	3.2	3.3
Percent of students eligible for free or reduced-price school lunch				
Less than 11 percent.....	3.8	4.7	3.8	4.5
11 to 30 percent.....	3.4	3.7	2.6	3.3
31 to 70 percent.....	2.5	2.9	2.7	2.2
71 percent or more.....	4.4	4.5	4.3	3.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 5a.--Standard errors of the percent of teachers in all public schools regularly using advanced telecommunications for teaching, professional development, and curriculum development, by school characteristics: Fall 1996

School characteristic	Teachers using advanced telecommunications for:		
	Teaching	Professional development	Curriculum development
All public schools.....	1.0	0.9	0.8
Instructional level			
Elementary	1.3	1.1	1.0
Secondary	1.2	1.0	0.8
Size of enrollment			
Less than 300.....	2.3	2.0	2.2
300 to 999.....	1.3	1.1	1.0
1,000 or more	1.5	1.3	1.7
Metropolitan status			
City.....	2.2	1.8	2.0
Urban fringe	2.4	2.0	1.8
Town	2.1	1.6	1.7
Rural.....	1.8	1.7	1.9
Geographic region			
Northeast	2.6	2.6	2.4
Southeast	2.4	1.9	1.7
Central	1.7	1.8	1.5
West.....	1.8	1.4	1.6
Percent minority enrollment			
Less than 6 percent.....	1.7	1.5	1.5
6 to 20 percent.....	2.1	1.9	1.8
21 to 49 percent.....	2.3	1.9	1.6
50 percent or more.....	2.4	1.8	1.8
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent.....	2.6	2.6	2.4
11 to 30 percent.....	2.0	1.8	1.6
31 to 70 percent.....	1.8	1.7	1.4
71 percent or more.....	2.9	2.3	2.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 6a.--Standard errors of the percent of all public schools in which advanced telecommunications training for teachers is mandated, encouraged by incentives, left up to teachers to initiate, or described in some other way, by school characteristics: Fall 1996

School characteristic	Advanced telecommunications training for teachers is:			
	Mandated by school or district or by teacher certification agencies	Encouraged by incentives	Left up to teachers to initiate participation	Other
All public schools.....	1.3	1.7	1.9	0.7
Instructional level				
Elementary	1.6	2.1	2.3	0.9
Secondary	1.6	2.4	2.4	0.9
Size of enrollment				
Less than 300.....	2.4	3.3	3.1	2.1
300 to 999.....	1.7	2.4	2.7	0.8
1,000 or more	2.6	3.4	3.8	1.7
Metropolitan status				
City	2.2	3.7	4.2	1.5
Urban fringe	2.5	3.8	3.8	0.8
Town	2.4	3.5	4.3	1.3
Rural.....	2.2	3.1	3.6	2.2
Geographic region				
Northeast	2.7	4.9	5.0	1.5
Southeast	3.6	3.2	3.7	1.5
Central	2.1	3.4	3.4	1.6
West.....	2.1	3.2	3.2	1.4
Percent minority enrollment				
Less than 6 percent	2.2	3.3	3.2	1.5
6 to 20 percent	2.7	3.6	4.5	1.1
21 to 49 percent.....	3.0	3.9	4.4	1.8
50 percent or more.....	2.7	3.9	4.8	1.5
Percent of students eligible for free or reduced-price school lunch				
Less than 11 percent	2.8	4.9	4.4	1.8
11 to 30 percent	2.2	3.6	3.4	1.5
31 to 70 percent	2.5	2.2	3.2	1.2
71 percent or more.....	3.1	4.3	5.1	2.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 7a.--Standard errors of the percent of all public schools by sources of support for advanced telecommunications in the school: Fall 1996

Organization	Support for advanced telecommunications					
	Funds	Hardware	Software	Training	Technical assistance	Network access
School district.....	1.2	1.8	1.9	1.9	1.8	2.0
College or university	0.3	0.4	0.5	1.2	0.8	1.0
Business or industry	1.0	1.2	1.2	0.7	1.0	0.7
State or federal government agencies	1.9	1.6	1.3	1.3	1.1	1.2
Other community nonprofit organizations (e.g., libraries, museums).....	0.9	0.8	0.8	0.6	0.6	0.3
Teachers.....	0.9	0.8	1.0	1.9	1.5	0.6
Students	0.3	0.4	0.5	0.7	0.6	0.3
Parents or other community members	1.5	1.4	1.4	0.9	1.2	0.4
Other.....	0.4	0.4	0.4	0.4	0.4	0.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

Table 8.--Estimates and standard errors for the figures: Fall 1996

Figure	Estimate	Standard error
Figure 1: Percent of public schools with Internet access, by type of network connection: Fall 1996		
1994		
Modem.....	97	0.7
SLIP/PPP	3	0.6
T1.....	3	0.8
56Kb	4	0.7
ISDN.....	*	*
1996		
Modem.....	74	1.8
SLIP/PPP	20	1.9
T1.....	12	1.5
56Kb	11	1.6
ISDN.....	4	0.7
Figure 2: Percent of public schools with Internet access, by the number of instructional rooms with access: Fall 1996		
None	5	1.2
One	43	2.5
Two or three	22	1.9
Four	4	0.8
Five or more	25	2.0
Figure 3: Percent of all public schools having or expecting Internet access between fall 1996 and the year 2000		
Current access.....	65	1.8
Planned access		
1997.....	74	1.5
1998.....	89	1.1
1999.....	93	0.9
Year 2000	95	0.8

*Data not collected for 1994.

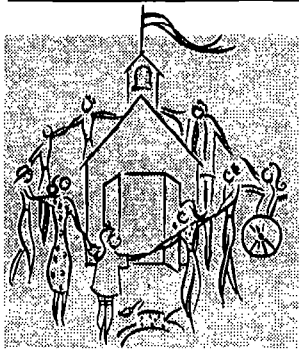
SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996," FRSS 61, 1996.

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Community Update

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Education



"Today's students need to know the basics....But they also need to take advantage of the unsurpassed learning opportunities available on the Internet."

— U.S. Secretary of Education
Richard Riley

Teachers Volunteer to Train Colleagues in Using Technology

A cross America teachers are joining a national team to help each other use technology to its full potential to enrich students' learning. They call themselves 21st Century Teachers, and they hope to be 100,000 strong.

The 21st Century Teachers' Initiative is administered by 19 national organizations representing parents, teachers, administrators, librarians, school boards, community colleges, and the high-tech industry, with the support of the U.S. Department of Education. This public-private partnership recognizes the urgent need to prepare students for the Information Age and the jobs of the future.

"Today's students still need to know the three R's, the old basics. But they also need to understand how to use the three W's — the World Wide Web, and take advantage of the unsurpassed learning opportunities available on the Internet," said U.S. Secretary of Education Richard Riley at an October 1 event in Washington, D.C., that was designed to recruit teachers to the effort.

The partners involved in the 21st Century Teachers Initiative understand that in order to best serve students, teachers themselves must sharpen their technology skills. 21st Century Teachers pledge to **build** their own expertise in using new learning technologies; **share** their expertise and experience with colleagues; **use** their expertise with students as part of the daily learning process; and **work** to make classroom technology available to all students and teachers.

administrators, business partners and other sponsors of the program pledge to support teachers by providing professional development opportunities, creating awards and incentives for using educational technology, and developing educational resources and curriculum materials that integrate advanced technologies into classroom learning.

Last month's event in Washington, D.C., took place at Highway 1, a state-of-the-art demonstration site funded by leading technology companies. Teachers demonstrated first-hand the wealth of educational resources available on the Internet and the specialized resources designed for educators at the 21st Century Teachers website. The 21st Century Teachers homepage can be accessed at <http://www.21ct.org>.

First announced by President Clinton in May 1996, 21st Century Teachers is a local grassroots initiative, achieving results community by community and classroom by classroom. "Trained teachers using the latest technology is the key to raising student achievement and student performance — and that, we know, is our goal," said Anne Bryant, Executive Director of the National School Boards Association, one of the sponsoring groups.

Other sponsors include the American Association of Community Colleges, American Association of School Administrators, American Association of School Librarians, American Federation of Teachers, American Library Association, Apple Computer, Inc., the Council of Chief State School Officers, ETC, IBM Corporation, the International Society for Technology in Education, National Association of Secondary School Principals, National Board for Professional Teaching Standards, National Congress of Parents and Teachers, National Council for Accreditation of Teacher Education, National Education Association, NetCom, Software Publishers Association, and United States Tech Corps. **CU**

Special Insert on Family Involvement (See inside)

Each 21st Century teacher volunteers to train 5 colleagues in how to use technology as a tool to enrich students' classroom experience and improve the quality of education. Parents,

FRIDAY, OCTOBER 11, 1996

Clinton Plan Would Wire All Schools

Communications Firms Would Pick Up Tab For Links to Internet

By Mike Mills
and Elizabeth Corcoran
Washington Post Staff Writers

The Clinton administration proposed yesterday to give every school and library in the United States free basic access to the Internet, with the cost to be paid collectively by the nation's communications carriers.

The plan, announced by President Clinton less than four weeks before the election, must still be approved by federal regulators and faces many technical and financial hurdles. The idea of wiring the nation's classrooms to the Internet has been a staple of administration campaign rhetoric for months.

In a speech yesterday in Knoxville, Tenn., Clinton called on the Federal Communications Commission to approve the plan, which aims "to give every elementary, middle and high school and every library in the country the lowest possible 'e-rate' [education rate]: free basic service to the Internet."

Clinton also called for \$100 million in federal spending starting next year to begin a five-year project to upgrade the Internet for 100 universities, national labs and other federal institutions.

A representative from GOP candidate Robert J. Dole's campaign staff derided the effort. "Once again, the teachers unions have scared Bill Clinton away from real education reform," said Dole campaign spokeswoman Christina Martin. "Little steps and small programs such as this will do little to ensure safer schools, drug-free schools and quality education for all."

In February, the new telecommunications law guaranteed the nation's grade schools and libraries discounted rates for basic Internet connections. But Congress left the size of the discount up to regulators.

In a filing sent yesterday to the FCC with the endorsement of Secretary of Education Richard W. Riley, Secretary of Agriculture Dan Glickman and Commerce Secretary Mickey Kantor, the administration began

See INTERNET, A11, Col. 1

THE WASHINGTON POST

FRIDAY, OCTOBER 11, 1996 A11

Clinton Administration Proposes Free Internet Access for All Schools, Libraries

INTERNET, From A1

to spell out its proposals for how the e-rate would work.

The administration is proposing to create two tiers of discounts. The first would offer free "basic connectivity and Internet access, at adequate transmission speeds," to grade schools and libraries. The cost of a second tier of services, such as video conferencing or high-speed Internet access, would be discounted—but not free—and influenced by how much the school could afford to pay. Schools and libraries in low-income or rural areas would be entitled to more generous discounts.

The administration gave no estimate of what its plan would cost, and recent studies vary widely. The Commerce Department earlier this year estimated it would require \$1.5 billion annually to provide the nation's schools with the most basic telephone-line Internet connec-

tions—a figure that does not include monthly Internet access charges, training and computer equipment.

To pay for the program, the administration wants to expand the scope of an existing fund that provides below-cost telephone service to poor and rural areas. That fund is now financed through charges to local and long-distance telephone companies, but under the new law will be funded through contributions by all telecommunications carriers.

Telecommunications companies—including phone companies, cable operators and cellular service providers—would be paid from that fund for providing the basic Internet link to schools and libraries. Companies would be encouraged to bid for contracts to serve schools. Precisely how much they would be compensated would depend on a calculation of the economic cost of the basic package plus "a reasonable profit margin."

Providers of Internet access also would be reimbursed for monthly service charges to those institutions, though the administration is silent on the method of compensation. Schools that already have basic Internet connections would be able to get a credit for purchasing additional Internet services.

The plan covers the nation's 100,000 public grade schools and 9,000 libraries as well as private, nonprofit schools with endowments of less than \$50 million.

Educators and administration officials say the Internet, particularly the graphics-rich part known as the World Wide Web, has become an increasingly important educational tool. With Internet access, students and teachers can tap into vast repositories of information from local sources as well as from far-away universities, libraries, businesses and institutions worldwide.

The White House proposal is aimed at influencing a special board of state and federal reg-

ulators, which plans by Nov. 8 to recommend funding options for discounted Internet access to schools and libraries. The FCC plans a final vote on the issue next spring.

Other proposals also have been submitted. Nynex Corp., for example, supports offering schools discounts for ongoing service charges of up to 50 percent, depending on the financial condition of the school, said Frank Gumper, vice president for federal regulatory planning.

But "free" programs worry the telephone companies. "We're overall opposed to generically giving everybody a 100 percent discount," Gumper said. "Someone is going to pay for it. . . . This money is going to be raised from other customers."

The administration's goal is based on Department of Education studies that conclude there should be one computer for every five children in each school. Only 4 percent of classrooms meet that ratio, according to the agency.

But getting schools wired for the Internet is only a first step, said Linda Roberts, who directs the Department of Education's office of educational technology. Schools also must find money for purchasing and maintaining the technology and for training teachers. "Probably the lowest cost is the actual connection," she said.

A recent study by McKinney & Co., a management firm, puts the total cost of meeting all of those technology goals at \$109 billion over 10 years.

In contrast, schools spent just \$3.3 billion on technology during the 1994-95 school year, according to the Education Department. Federal funds accounted for about one-quarter of that, compared with a 7 percent federal share for overall education spending.

Staff researcher Barbara J. Saffir also contributed to this story.



FOR RELEASE
October 10, 1996

Contact: Rick Miller
(202) 401-3026

EDUCATION, AGRICULTURE, COMMERCE CALL FOR FREE INTERNET ACCESS FOR SCHOOLS, LIBRARIES

In a letter delivered today to the chairman of the Federal Communications Commission (FCC), Education Secretary Richard W. Riley, Agriculture Secretary Daniel R. Glickman and Commerce Secretary Michael Kantor call for "a guarantee of universal access to advanced telecommunications and information services for every public, private and parochial K-12 school and library in America."

President Clinton announced the proposal today in a speech in Knoxville, Tenn.

Calling the Internet "the blackboard of the future," the cabinet officials said many schools and libraries cannot afford the connection charges and on-going monthly fees usually required by Internet service providers.

Written on behalf of the administration, the filing with the FCC proposes "an E-rate" -- "a free education rate that will guarantee that we reach the goal of universal connectivity by the year 2000."

"This proposal," the secretaries write, "supports the long-standing American tradition of providing free education to every American child. It builds on significant investments by schools and libraries. In fact, schools and libraries are investing millions of dollars on computers, software, and teacher training. Those investments would be jeopardized if schools and libraries cannot afford to pay the monthly access charges."

The FCC's Federal-State Joint Board on Universal Service will consider the proposal at a October 17 meeting and is expected to make a recommendation to the commission on November 8.

###

NOTE TO EDITORS: The letter and a summary of the FCC filing are attached.





UNITED STATES DEPARTMENT OF EDUCATION
THE SECRETARY

October 10, 1996

The Honorable Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: Federal-State Joint Board on Universal Service.
CC Docket No. 96-45

Dear Chairman Hundt,

We are writing at a critical juncture in the effort to implement the universal service provisions of the Telecommunications Act of 1996. The Federal-State Joint Board that you chair will soon make its recommendations to the Commission concerning policies that will preserve and advance our nation's long-standing goal of affordable access to telecommunications service for all Americans including schools, libraries and rural health care clinics. We commend you and the other members of the Joint Board for your commitment to universal service and stand ready to provide any assistance that may help the Board successfully complete the important task at hand.

As you know, the Clinton Administration is strongly committed to the prompt deployment of a basic package of telecommunication services to every school and library in America—urban, suburban, and rural—to ensure that our nation's learners—both children and adults—have universal access to the Information Age. On behalf of the Administration, NTIA at the Department of Commerce, the Department of Education, and the Department of Agriculture are today filing a plan to implement the E-rate, a free "education rate," that will guarantee that we reach the goal of universal connectivity by the year 2000.

Technological literacy is a critical skill for America's students to succeed in the 21st century. Simply put, today's work force rewards those workers who possess computer literacy skills, and tomorrow's work force will demand computer literacy skills. In order to prepare our children to meet the challenges of the 21st Century, universal access to the Information Superhighway will be critical. The Internet, in many ways, is the blackboard of the future. It is our strong belief that by advancing free basic access, we will increase the pace of classroom learning and continuing efforts to improve education.

Unfortunately, the cost of access to telecommunication services continues to be a barrier for too many schools and libraries. These costs prevent many of our teachers and children from using the vast educational resources available on the Internet. Working with educators and

800 INDEPENDENCE AVE., S.W. WASHINGTON, D.C. 20202-0100

Our mission is to ensure equal access to education and to promote educational excellence throughout the Nation.

librarians from around the nation, we know that connections to the Internet are only one part of the answer. The second part is the on-going monthly charges for access, and here we find that there is great disparity in what schools and libraries are paying for access. By way of illustration, we know that some districts are paying about \$200 a month in access charges while others pay \$2,000 for the same technology and services.

In adopting the Telecommunications Act of 1996, Congress recognized for the first time the need to ensure that all schools and libraries are included in the context of Universal Service. Although we are making progress in connecting our schools, today only 9 percent of our classrooms are connected. For these reasons, this Administration supports a guarantee of universal access to advanced telecommunications and information services for every public, private, and parochial K-12 school and library in America. This proposal ensures that no school or library will be denied the opportunity to participate in the Information Age because of an inability to pay.

This proposal supports the long-standing American tradition of providing free education to every American child. It builds on significant investments by schools and libraries. In fact, schools and libraries are investing million of dollars on computers, software, and teacher training. Those investments would be jeopardized if schools and libraries cannot afford to pay the monthly access charges. This proposal guarantees universal access to the Information Superhighway for every school and library in America.

We recommend that the Joint Board endorse the concept and principles that we are presenting today as well as the framework for implementation that we propose. Under separate cover, we have requested that the Departments of Commerce and Education be permitted to present this proposal to the Joint Board at its meeting on October 17, 1996. At that time, we will further describe the goals and operation of the E-rate and be available to answer any question you may have.

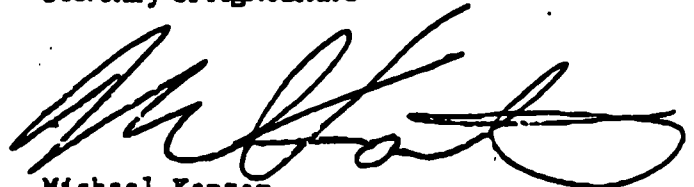
Sincerely,



Richard W. Riley
Secretary of Education



Daniel R. Glickman
Secretary of Agriculture



Michael Kantor
Secretary of Commerce

cc: Commissioner Rachelle B. Chong
Commissioner Susan Ness
Commissioner Julia L. Johnson, Florida
Public Service Commission
Commissioner Kenneth McClure, Missouri
Public Service Commission
Commissioner Sharon L. Nelson, Washington
Utilities and Transportation Commission
Martha S. Hogerty, Public Counsel for the
State of Missouri
Commissioner Laska Schonefelder, So. Dakota
Public Utilities Commission

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
Federal-State Joint Board on) CC Docket No. 96-45
Universal Service)

FURTHER COMMENTS OF THE
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

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National Telecommunications and
Information Administration U.S.
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Room 4713
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Washington, D.C. 20230
(202) 482-1816

October 10, 1996

SUMMARY

In the Telecommunications Act of 1996, Congress recognized, for the first time, the crucial role of America's schools and libraries in bringing the benefits of the Information Age to our country. Believing that if special and advanced telecommunications and information services are made available to educators, children, and parents through our schools and libraries, America will be better poised to meet the challenges of the 21st Century, Congress adopted the Snowe, Rockefeller, Exon, and Kerrey Amendment. This provision -- now Section 254(h) of the Act -- seeks, among other things, to ensure that schools and libraries become connected to the National Information Infrastructure (NII) through preferential rates for "special services" as defined by the Federal Communications Commission.

At this critical juncture, the Joint Board has an opportunity to articulate a public policy that will shape access to telecommunications and information services for the coming century. Recently, Representative Edward Markey (D-MA) and Senator Byron Dorgan (D-ND), together with U.S. Education Secretary Richard Riley and Larry Irving, Assistant Secretary for Communications and Information at the Department of Commerce, advanced the concept of an "E-rate" applicable to basic telecommunications services for schools and libraries. This "education rate" would guarantee a free package of basic telecommunication services to every school and library in America. In addition, discounted rates for access to other

services used for "educational purposes" would be established.

On June 29, 1996, Vice President Gore stressed that affordable connections to information networks available today and in the future are an essential part of the Administration's comprehensive initiative on technology literacy. He called upon state and federal regulators to implement the vision of the Telecommunications Act to ensure the availability of affordable, universal access to the tools of the Information Age.

On behalf of the Administration, the National Telecommunications and Information Administration (NTIA) at the Department of Commerce, the Departments of Education and Agriculture now offer guiding principles for and an approach to establishing discounted rates for schools and libraries that we believe further the goals of the Act and will ensure that the vision of the E-rate proposal becomes a reality. We recommend that the Joint Board endorse the E-Rate concept and adopt the framework we present below.

In fashioning new universal service policies for schools and libraries, the Commission and the States must ensure that those policies are consistent with the Act's mandate to foster meaningful competition in every segment of the telecommunications marketplace in all U.S. jurisdictions. The Administration's E-rate proposal seeks to fulfill the mandate of section 254(h) of

the 1996 Telecommunications Act, by melding a competitive bidding model with a basic package of telecommunication services that would be universally available to all schools and libraries. The plan's system of discounts would be applied on a tiered basis, with a credit feature allowing for the most flexible use.

Most fundamentally, the E-rate plan would seek to ensure an initial deployment of basic telecommunications and information capabilities to all schools and libraries that would be integrated with the curricula and research skills needed for success in the next century. The first-tier discount would apply to K-12 schools and libraries as directed by the Act. The basic package would enable schools and libraries to gain access to services at no cost to them and would include basic connectivity and Internet access, at adequate transmission speeds.

Calculation of the cost of the basic package for a school or library should be based on prices or economic costs, including a reasonable profit margin, that approximate a competitive result. While the basic E-rate package would be free to a school or library, competitive bids would be used to help determine the amount reimbursable from the universal service fund (USF) to the winning carrier.

Beyond the basic package of services, other services would be discounted less than 100%. These services could conceivably

encompass any offering of telecommunications service providers other than basic connectivity and Internet access. The service provider would receive the basic package credit applied against the total purchase of special and advanced services if the school chose not to take the basic package. For the non-basic package services, the bids, constrained by a "best value" ceiling, would serve to substantially reduce the price a school or library would pay but would not generally be reimbursed from the USF; the fund would be tapped only for high-cost and low-income areas.

For high-cost or low-income schools or libraries, a further discount would be applicable. The discount for a given school or library could be based on an affordability index whereby these institutions would receive greater price reductions. Rural locales comprise a disproportionately large percentage of high-cost areas. The amount of the discounts for high-cost and low-income areas would be properly covered by the USF.

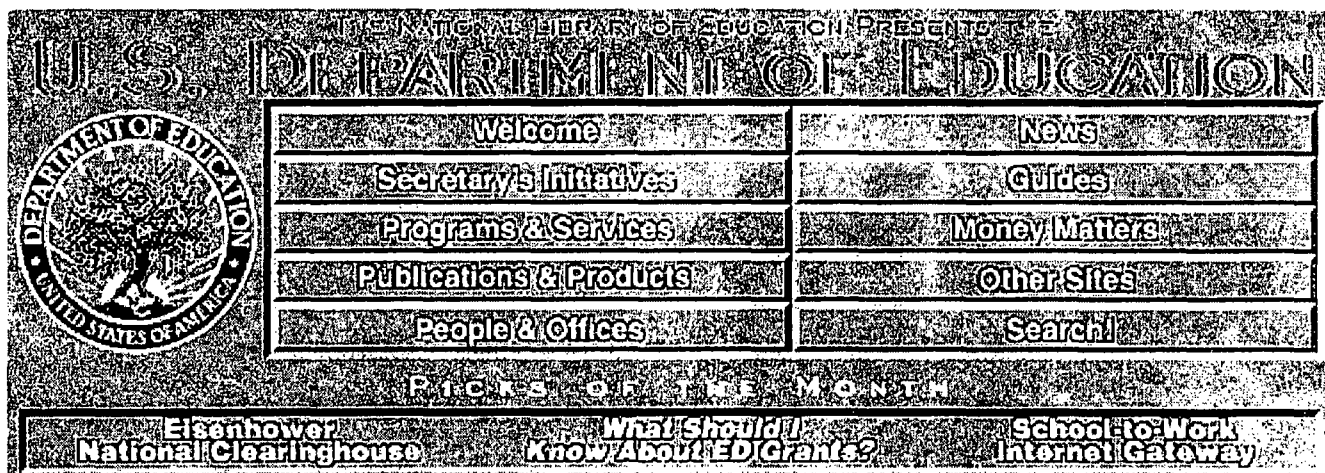
The workings of the marketplace, coupled with a variety of public-private partnerships for training, hardware, content, and technical support, should help meet the Administration's goals of connecting all schools and libraries by the year 2000. Contributions -- whether donations of new or surplus system, free software, NetDay internal connections, volunteer training or technical assistance -- would complement the E-rate. Moreover, market opportunities can be realized by users as well as

suppliers; banding together in buying coalitions, schools and libraries can produce even greater volume discounts and scale economies benefiting all concerned. In addition to the importance of contributions and market opportunities, sustainability should be fostered due to the attractiveness of both "total-package" and volume sales for providers as well as the new capabilities afforded students, teachers, librarians, and their patrons through procurement of Information Age capabilities.

Integrating education and functionalities is pivotal. Educational objectives and curricula should properly drive the use of bandwidth, transmission speed, and other functionalities. The Administration also recommends that the E-rate and USF approach be revisited by the Joint Board and the FCC every three years or sooner if requested by bona fide petitions. During these triennial reviews, policymakers should solicit views from all stakeholders in the educational system to ensure a dynamic process.

U.S. Department of Education Online Library

Public Access via Internet
through the National Library of Education's INet System



Individuals with access to the Internet can tap a rich collection of education related information at the U.S. Department of Education (ED), including:

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ General Information about the Department's Mission, Organization, Key Staff, and Programs ■ Information about Key Departmental Initiatives, such as GOALS 2000, Technology, Family Involvement, School-to-Work Programs, and Elementary and Secondary Schoolwide Projects ■ Full-text Publications for Teachers, Parents, and Researchers ■ Statistical Tables, Charts, and Data Sets ■ Research Findings and Syntheses ■ Directories of Effective Programs and Exemplary Schools ■ Directories of Information Centers and Sources of Assistance | <ul style="list-style-type: none"> ■ Student Financial Aid Information ■ Press Releases ■ Status of Legislation and Budget ■ Selected Speeches and Testimony by the Secretary of Education ■ Grant Announcements and Applications ■ Event Calendars ■ Announcements of New Publications and Data Sets ■ Searchable ED Staff Directory ■ Links to Public Internet Resources at ERIC Clearinghouses, Regional Laboratories, R&D Centers, and other ED-Funded Institutions ■ Links to other Education-Related Internet Resources |
|--|---|

The Department's Internet Online Library is maintained by the National Library of Education (NLE) in the Office of Educational Research and Improvement (OERI) on its Institutional Communications Network (INet).

Latest Developments

The GOALS 2000 legislation reauthorized OERI and created the National Library of Education (NLE), which is responsible for assembling and providing access to a comprehensive collection of education information, as well as promoting resource sharing and cooperation among libraries and other providers of education information. INet and ERIC are core components of a distributed electronic repository which NLE plans to develop in close collaboration with the National Education Dissemination System (NEDS), which also was established in OERI's reauthorization.

In response to customer demand we are making much more information available in hypertext markup language (HTML) format on our World Wide Web server. In September we unveiled a new, completely redesigned WWW home page which was very well-received. *Government Executive* (11/95) called it "among the classiest--and most useful--of all federal sites." Point Communications rates us among the top 5% of Web sites. In October we logged more than 1.3 million accesses from 75 countries.

Access via Internet

Although WWW is the access method of choice for 75% of our customers, we are committed to providing access to as much of our information as possible through Gopher, FTP, and E-Mail for those users who still depend on those methods. We are committed to providing text-only equivalents to all graphical features to accommodate visually impaired users.

World Wide Web	http://www.ed.gov/
Gopher	gopher.ed.gov or select North America-->USA-->General-->U.S. Department of Education from the All/Other Gophers menu on your system
FTP	ftp.ed.gov (log on anonymous)
E-Mail	Send e-mail to almanac@inet.ed.gov to get instructions on usage of our mail server In the body of the message type send catalog (avoid use of signature blocks)
Telnet	No public telnet access is available. You must either have an appropriate WWW, Gopher, or FTP client at your site or be able to telnet to a public access client elsewhere.

Questions and Comments

If you have any suggestions or questions about the contents of the WWW, Gopher, FTP, and Mail servers, please use one of the following addresses:

E-mail: inetmgr@inet.ed.gov
gopheradm@inet.ed.gov
webmaster@inet.ed.gov
Telephone: (202) 219-2266
Fax: (202) 219-1817

Snail Mail: **INet Project Manager**
National Library of Education
U.S. Department of Education/OERI
555 New Jersey Ave., N.W. Rm. 214
Washington, D.C. 20208-5725

US Department of Education Technology Initiatives

Through projects initiated under the Improving America's Schools Act and through long-term programs, the Department of Education promotes the use of technology in schools, libraries, and communities to achieve its mission of ensuring equal access to education and promoting educational excellence throughout the nation.

- ☐ [Star Schools Program](#) 
- ☐ [National Long-Range Plan for Technology in Education](#)
- ☐ [Resource Guide to Federal Funding for Technology in Education](#)
- ☐ [Challenge Grants for Technology in Education](#)
- ☐ [Secretary's 1995 Conference on Educational Technology](#)
- ☐ [Secretary's 1994 Conference on Educational Technology](#)
- ☐ [Satellite Town Meeting on Technology](#)
- ☐ [Telecomputing for Teaching and Learning: Stories of People Using Computer Networking for Learning](#)
- ☐ [Additional Information about Technology Initiative on ED/OERI Gopher](#)
- ☐ [Teachers and Technology: Making the Connection](#) (from the Office of Technology Assessment)
- ☐ [Reinventing Schools: The Technology is Now!](#) (from the National Academy of Sciences and the National Academy of Engineering).
- ☐ [Regional Technology Consortia Program](#) - Announced 11 May, the full application package, including forms, was published in Part VII of the Federal Register. The application package is also available, without the forms, in electronic format from this server.

-###-



Last update November 14, 1995 (BNS).

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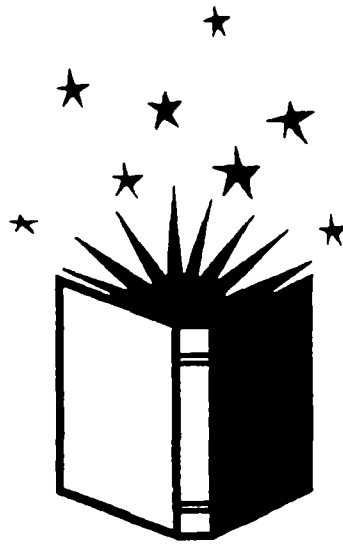
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peter_kickbush@ed.gov

EDUCATIONAL TECHNOLOGY:

TOOLS FOR TRANSFORMING TEACHING AND LEARNING



GOALS
2000

A resource guide for teachers, administrators, coordinators, and community members with an interest in using technology to improve education for all students

This guide was prepared by the Office of Educational Technology, Dr. Linda G. Roberts, Director
United States Department of Education

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EDUCATIONAL TECHNOLOGY:

TOOLS FOR TRANSFORMING TEACHING AND LEARNING

People in schools and communities engaged in the work of comprehensive education reform know how difficult truly comprehensive reform is. "We believe in the National Education Goals," many of them say. "We know we want all our children to meet high standards. But, how do we help them get there?"

Many schools and communities are finding that technology can help answer that question. Technology can play an important role as communities begin the process of education reform. From telephone answering devices and fax machines to the most advanced computers and laser disc players, these tools can help schools and communities create high-performance learning environments where *all* children reach high standards.

The possibilities seem endless. Consider just a few examples:

- * Voicemail systems allow parents to check on a child's daily homework assignments and school schedule.
- * Interactive satellite links give students a chance to take courses by television, allowing them to learn subjects such as languages or advanced calculus even if there is no teacher available in their own schools.
- * Electronic bulletin boards offer an opportunity for teachers to share lessons and instructional tips with other teachers in the community or around the country.
- * Online computer networks offer an opportunity for kids in different parts of the country to work collaboratively on challenging, real-world problems in subjects such as ecology and geometry.
- * Software and equipment offer an opportunity for students to research and then create multi-media presentations using sound, text, and full-motion video.
- * Low-cost modifications to classroom computers make it possible for children with disabilities to communicate and participate fully with other students.

But technology is not the solution to all education concerns. Simply bringing technology into the school does not guarantee its effectiveness. Teachers, students, administrators, and community members must learn how to use the technology they have. This includes both official training time, as well as time to explore independently. Ideally, the introduction of technology will occur in conjunction with other major changes in a school; simply fitting technology within existing frameworks will not be effective. If technology is to help transform teaching and learning, it must be used as an *integral* part of the school's learning environment. Experts warn against corralling all the computers in a "technology lab" or using technology for drill and practice exercises.

"It takes more than a box," writes Piscataway, New Jersey school superintendent Philip E. Geiger. "Computers, satellite uplinks and downlinks, interactive software, scanners and fiber optics mean nothing if teaching doesn't change to reflect the way kids learn."

Communities and schools that have met the most success in their use of technology have done so when they made sure that it was used *to improve the way the entire school works* -- from the way that parents and teachers interact, to the way that student attendance and performance information is collected and used, to the way children work and learn together.

Examples of Schools Using Technology

Perhaps the best way to talk about the vast array of possibilities that technology offers for improving teaching and learning is to look at what specific schools and communities are doing. Here are just a few examples of how teachers and educators have put technology to work.

- o Roger Coffee, the principal at Webster Elementary School, in Saint Augustine, Florida, is using technology to improve communication and get students more involved in their own learning. An in-house TV production room enables students to "produce" the morning news and announcements for him. A school-wide electronic mail system allows him to keep in touch with the school's teachers, who can in turn keep in touch with each other. This means that requests and questions can be answered in minutes, rather than days. Coffee also uses a computer program to produce a weekly parents' newsletter that looks professional. A voicemail system enables parents and teachers to leave messages for each other. The voicemail system also provides parents with easy access to the frequently-asked questions, such as what are evening's homework assignments.
- o TEAMS is a set of math and science courses for grades 2-6 offered via satellite by the Los Angeles County Office of Education. Students attend an interactive telecast lesson once a week hosted by a master teacher. Through the lesson, students learn about conducting science experiments and about scientific methods. Each lesson requires them to gather and organize data from a variety of sources, conduct experiments in their own classroom, or perform mathematics exercises. But students aren't the only

ones benefiting from TEAMS. Teachers learn new techniques in science and receive support materials to help them construct their own lesson plans. Originally funded by a grant from the U.S. Department of Education's Star Schools program, TEAMS now reaches 50,000 students nationwide.

- o The Dallas Independent School District has been considering how to make technology work for the diverse, urban student population it serves. It has taken impressive steps toward improving services to special education students in the district. A Special Advisory Committee on Technology, composed of teachers from different grade levels, was established. This group evaluated technology and conducted teacher training days around the district. The district has integrated videodiscs, computers, and other state-of-the-art technology into the management, administration, and teaching of special education classes, and has shown dramatic results in using technology to assist in educating special needs youth.
- o Students at the Dalton School in New York City and the Juarez-Lincoln School in Chula Vista, California learn about archaeology by engaging in a simulated "dig" of an actual site in ancient Greece. Students work together to uncover objects and use computer based tools to measure and classify the objects they uncover. They use databases and other reference materials to analyze the artifacts, and then pool their research to come up with an overall interpretation of the site. This joint work is made easier by a shared database that all the students can access. In the course of learning facts about history, the students acquire historical interpretation skills as well.
- o Each week some 2,000 students and teachers in the Chicago area participate in the "Ask a Scientist" program. Students ask questions about biology, chemistry, physics, engineering, math, computer science, and the environment, and the U.S. Department of Energy's Argonne National Laboratory offers a free online bulletin board where questions are submitted to scientists. Students can get help with homework and research. Teachers exchange instructional materials and share ideas for field trips, workshops, and other school activities.

It is important to remember that the effective use of technology must expand beyond individual schools. Although pilot projects are certainly worthwhile, only by planning for all schools to use technology in these ways can we reach our goal of helping all students achieve higher standards.

It is also important to recognize that quality improvement can be made in any environment. Urban, suburban, and rural districts, with varied financial situations, have all had success with technology in their classrooms.

Planning for Technology in Education

Technology is neither an end in itself nor an add-on. It is a tool for improving -- and ultimately, transforming -- teaching and learning. To accomplish that job, technology must be an integral part of your school or community's overall plan to move all children toward high academic standards. The use of technology also requires planning because without certain key elements, including adequate budgeting for professional development and technical support and the support of school leaders, the benefits of technology will probably not be realized.

Your community and schools will want to ask the following questions while planning for the use of technology. Keep in mind that there is no one best way to answer them, and that the answers may change over time.

How will the technology be used? Will the uses be electronic mail, satellite-delivered instruction, access to electronic databases and libraries, multimedia software for instruction, "tool" software such as spreadsheets and word processors, access to resources for students with disabilities, or administrative uses such as record keeping and communicating with parents?

How will the introduction of technology effect the way the school works? How will the school adjust to make the best use of technology? How can the technology be used after school and by community members in continuing education? How can technology be used improve all aspects of the basic structure and operation of the school?

How will technology affect the role of teachers? Will teachers have adequate professional development and time to learn how to integrate new tools into their instructional practices? Will teachers have access to enough ongoing technical support? Should evaluation and certification criteria for teachers be changed to support the use of technology?

How can the community be involved in the introduction of technology in the school? How will members of the community be involved in the planning process? How can resources such as local cable, local phone service, and local organizations be utilized?

How much will the changes cost? Will they be worth the expense?

What will the results be? What research exists to support the plan? How will you know if your objectives have been met?

How will decisions about purchases be made? Will these decisions be part of a larger plan to improve education in your district or school? How can you ensure that the equipment purchased remains usable as long as possible? How will funding be distributed among schools? How closely will you work with vendors? Who can give you sound advice about technology purchases?

How can technology benefit all students? How will students with disabilities benefit from the changes? How can technology benefit students at risk of dropping out or who are not performing well? Will there be a standard minimal technology base in all schools?

The planning process can be difficult, but it is also vital to success. It is important to remember that you are not working alone. There are many people studying the use of technology in education, and you can, and should, use them as a resource.

- o Check to see if your state or district has a plan for technology. Some states also hold technology conferences, and have groups considering uses of technology in education. Your state department of education can be a valuable source of advice and support as you begin to think about how technology can improve your schools.
- o Look around your community for organizations that can provide advice, encouragement, and financial and technical support. The local telephone company, the cable television provider, and other businesses can be key partners. Local libraries, museums, universities, and federal entities, including the regional and national laboratories, can also help.
- o Finally, consult some of the many resources listed in this guide. The following list of resources is just a small sample of networks, organizations, programs, and publications that can help with important decisions regarding equipment, training and funding. This does not represent an endorsement of any of these groups, merely a sampling of what is available. As you navigate your way through the field of educational technology, you will find there are many other sources of help not mentioned here.

The following resource guides can also be helpful in the planning process:

- o Bailey, Gerald & Lumley, Dan. *Planning for Technology: A Guidebook for School Administrators*. Scholastic Book Service, 1993. (800)325-6149.
- o Barker, Bruce O. *The Distance Education Handbook: An Administrator's Guide for Rural and Remote Schools*. America: ERIC Clearinghouse on Rural Education and Small Schools, 1992. (304) 347-0487.
- o Council of Chief State School Officers. *Improving Student Performance Through Learning Technology: Policy Statement 1991*. Washington, DC: CCSSO, 1992. (202) 408-5505.
- o Cradler, J.D. *Planning for Technology Applications in Education*. Far West Laboratory, 1994. (800)622-4160.

- o Hezel Associates. *Educational Telecommunications: The State-by-State Analysis 1993. America: Hezel Associates, 1993. (315) 422-3512.*
- o The K-12 Network Planning Guide. This guide was compiled by the California State Department of Education. For information, contact Carol Teach, Manager, K-12 Network Planning, California Department of Education; (916) 654-9662.
- o The Key Elements of Effective State Planning for Educational Technology. Prepared by the Southern Regional Education Board, in collaboration with BellSouth, this guide provides assistance to communities planning uses for education technology. For a copy of the guide, contact Sue Jones at the Southern Regional Education Board (404) 875-9211.
- o The National Center For Technology Planning (NCTP) is a clearinghouse for the exchange of information related to many types of technology and planning. Its goals are to collect and disseminate information, and to provide assistance for people using that information. The Center has copies of district technology plans from districts across the country. These plans can be downloaded through electronic networks, along with other information on education technology planning. For information contact: Dr. Larry S. Anderson, founder/director, Drawer NU-Mississippi State, MS 37962; or phone (602) 325-2281. Internet: LSA1@Ra.MsState.edu
- o National Education Association. *Educational Telecommunications: Final Report of the NEA Committee on Educational Telecommunication. America: NEA 1993. (202) 833-4000.*
- o Sheehan, Bernard S. "Planning for Information Technology." *New Dimensions for Institutional Research*, September 1982: 105-116.
- o Tackett, Austin, et.al. *The Technology Advisory Council: A Vehicle for Improving Our Schools*. International Society for Technology in Education, 1993. For more information contact: Mia House, (503) 346-4414.

Supporting Research

While many would agree that technology is changing the way we live, the classroom remains one place in which we are still struggling to take full advantage of technology's power. Many continue to question whether research evidence supports a major investment in technology in the classroom.

In fact, reviews of the literature show that computer-based instruction usually results in significant increases in achievement and opportunities to learn, and it is cost-effective (Kulik and Kulik, 1991; Bialo and Silvin, 1991). In addition, studies show other positive results:

- o Krendl and Fredin (1988) showed that students who used electronic encyclopedias produced papers which demonstrated a greater breadth and depth of knowledge; in a 4th grade writing class, students who used telecommunications increased an average of three grade levels in language mechanics and two grade levels in language expression (similar results were shown by Cohen and Riel, 1989).
- o Collins (1991) showed that when technology was introduced into the classroom, teaching styles changed from whole-class instruction to small groups, lectures were replaced with coaching, less emphasis was placed on tests and more on products and work produced, students became less competitive and more cooperative, different learning styles were accommodated more easily, and visual and motor skills were enhanced.
- o Fletcher, (1991) conducted a Congressionally mandated review covering 47 comparisons of multimedia instruction with more conventional approaches to instruction found time savings of 30%, improved achievement, cost savings of 30-40%, and a direct, positive link between amount of interactivity provided and instructional effectiveness.
- o Fletcher, Hawley, & Piele (1990) showed a comparison of peer tutoring, reducing class size, increasing the length of the school day, and computer-based instruction to be the least expensive instructional approach for raising mathematics scores by a given amount.
- o Interactive Educational Systems Design (1993) conducted a survey of studies on the effectiveness of technology in schools that concluded that "courses for which computer-based networks were used increased student-student and student-teacher interaction, increased student-teacher interaction with lower-performing students, and did not decrease the traditional forms of communications used."
- o National Council on Disability's landmark study of the use of technology for persons with disabilities found that "almost three-quarters of school-age children were able to remain in a classroom, and 45% were able to reduce school related services."
- o Orlansky & String (1979) showed that a review of computer-based instruction used in military training found that students reach similar levels of achievement in 30% less time than they need using more standard approaches to training.
- o Pogrow (1991) demonstrated that technology use improved higher-order thinking skills.

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Orlansky, J., & String, J., 1979. IDA Paper, Institute for Defense Analyses. *Cost-Effectiveness of Computer Based Instruction in Military Training*, 1375.

Pogrow, S., 1990. "Learning Dramas: An Alternative Curriculum Approach to Using Computers with At-Risk Students." Wagner (ed.), *Technology in Today's Schools*. Alexandria, VA: Association for Supervision and Curriculum Development.

Networking and the Internet as a Resource

Telecommunications technologies can change teaching and learning dramatically. New technologies are offering new ways to bring resources to the classroom and community. Teachers and students with access to a computer, a modem, and phone lines are freed from the constraints of space (the physical limits of the school building) and time (the typical 8 a.m. to 3 p.m. school day). Through computer networks, teachers can communicate with peers and gain access to a vast array of electronic resources.

The Internet is a global "network of networks" originally developed to connect researchers at universities and government laboratories. Today it is much more. While there are still some obstacles to using the Internet, new tools and access points are being developed every day. Not only are 10 million users able to "talk" to colleagues worldwide but the Internet also provides users with access to a vast amount of information, including a growing collection of education resources. The Internet uses the high-speed capability of the National Science Foundation's NSFnet, which serves as a backbone to the Internet, to link the various national, regional, and local networks.

Increasingly, access to the Internet is a key part of plugging into the world of networking. Millions of people currently use the Internet, and the number of nonprofit institutions and commercial services offering Internet connections is growing every day. This means that educators seeking to get involved with networking should aim, whenever possible, for access to the Internet. For teachers, students, or parents already connected to commercial network services such as CompuServe, America Online, or Prodigy, these services have gateways to the Internet as well.

It is also important to understand that there are many different levels of service available. Beginning with what computer to purchase and what type of phone line you will need, there are many questions that need to be considered. Having electronic mail access does not necessarily allow you to use all of the facilities available online. Some districts choose to gradually add on new levels of connectivity, while others begin with a comprehensive package. There are many important questions regarding Internet that must be considered as a part of the planning process. An important resource regarding the technical aspects of Internet connection entitled Stages of Internet Connectivity for School Networking is available (prepublication) from Robert D. Carlitz (Department of Physics & Astronomy, University of Pittsburgh, Pittsburgh, PA 15260).

Once you have access to the Internet, the resources available are too numerous to list. Once an Internet connection has been established, there is room for exploration by teachers, administrators, and students. There are countless books and magazines available to help as guides to the Internet. Titles such as Internet World magazine, as well as books such as The Whole Internet and The Internet Companion are widely available. Once the Internet

connection is established, these and other books can help with initial understanding of this new tremendous classroom tool.

State Networks

There are a growing number of state, regional, and local networks affording opportunities for K-12 educators and students to connect to the Internet. Some states, including Texas, North Dakota, Virginia, Florida, and California, provide low-cost or free connections for individuals and schools within the state. More and more states are providing network access for K-12 users. In addition, some of the National Science Foundation's mid-level and regional networks are providing fee-based access to the Internet.

In 28 states, teachers are using statewide electronic networks to share ideas and lesson plans, discuss issues of mutual interest, and obtain information for planning, curriculum development, and instruction. There are also several regional consortia of educators concerned with technology issues. Interested persons should contact their state education agencies to find out about services in their area. The Council of Chief State School Officers (CCSSO) can refer individuals to the state technology coordinator in each state education agency. Council of Chief State School Officers, 1 Massachusetts Avenue, N.W., Suite 700, Washington, DC 20001; (202) 408-5505. Contact: Anne Kohls. A sample of some of the possibilities of statewide electronic networks is listed below:

- o California Online Resources for Education (CORE) provides K-12 teachers with electronic access to e-mail, the Internet, and education-related curriculum materials. Currently, 6,000 teachers use CORE, dialing into 20 California State University campuses.
- o SENDIT is a pilot K-12 computer network for North Dakota educators and students developed by the North Dakota State University (NDSU) School of Education and Computer Center. More than 70 forums have been established for topical discussions.
- o More than 3,000 teachers and administrators in Florida have free accounts for e-mail on Florida Information Resource Network (FIRN). FIRN users also can access the ERIC database and library card catalogs of several colleges and universities in Florida through the network.
- o Texas Education Network (TENET) currently links more than 30,000 K-12 educators and administrators who use the network for e-mail, resource sharing, and access to databases via the Internet.

- o In Tennessee, more than 1,600 teachers are participating in the Virtual School program. This program links classes in grades K-12 and provides opportunities for class discussions as well as teacher interaction across the state.

National Networking Resources

Consortium for School Networking (CoSN)

CoSN is a membership organization formed to further development of, promote access to, and encourage use of telecommunications in K - 12 education. Members represent educational, institutional, and commercial organizations with an interest in advancing the state of the art in all aspects of educational telecomputing. CoSN's goals are to promote (1) equitable access to the National Information Infrastructure to support education and systemic reform in all schools nationwide, (2) the development and distribution of network-based information resources for education and students, and (3) instruction of network-based information resources. CoSN, 1250 24th Street, NW, Suite 300, Washington, DC 20037; (202) 466-0533. Internet: INFO@COSN.ORG.

Federation of American Research Networks (FARNET)

FARNET is a nonprofit corporation that does research on the use of the Internet for educational purposes. Its members include local, state, regional, national, and international providers of electronic network services. FARNET can refer callers to state and local networks around the country. Copies of research reports are also available. FARNET, 100 Fifth Avenue, Waltham, MA 02154; (617) 890-5120

Internic Information Services (IIS)

The mission of IIS is to collect, maintain, and distribute information about the Internet and provide assistance to networking end users. The Directory and Database Services division maintains the Internet Resource Guide, which is available through anonymous file transfer protocol at INFO@INTERNIC.NET. directory resource-guide. This and other resources can also be obtained by sending e-mail to INFO@INTERNIC.NET and typing in the body of the message: Request: info, Topic: help. IIS also offers network assistance through a telephone hotline. Internic Information Service, 10 Moulton Street, Cambridge, MA 02138; Hotline: 1-800-444-4345. Internet help: INFO@INTERNIC.NET.

Learning Link National Consortium

Learning Link is a computer-based, interactive communication system for K-12 educators, students, adult learners, and public television viewers. It features databases and information resources, message centers, and mail and gateways to remote sites. Its services are locally managed and operated by public broadcasting stations, education agencies, or community organizations in 13 states. A national version is available to those who do not have access to the local version. The national consortium provides technical support. Contact: WNET/13. 356 West 58th Street, New York, NY 10019; (212) 560-6613.

SpecialNET

In operation since 1981, this information network offers educators and administrators e-mail, bulletin boards, conferencing, and databases that address various topics in special education. Sponsored by the National Association of State Directors of Special Education, it includes a variety of bulletin boards maintained by editors with expertise in the fields covered, including learning disabilities, parent involvement programs, and special education litigation. For subscription information, contact GTE Education Services, GTE Place, West Airfield Drive, PO Box 619810, Dallas/Fort Worth Airport, TX 75261-9810; (800) 927-3000.

Technology Organizations

Association of Educational Communications and Technology (AECT)

The Association of Educational Communications and Technology (AECT) is an association serving educational media and instructional technology professionals. The association works toward systemic improvement of instruction and learning through effective use of technology. AECT publishes Tech Trends, a magazine about integration of technology and education, and Educational Technology Research and Development (ETR&D) a quarterly scholarly journal devoted to research on educational technology and instructional development. For membership and subscription information, contact: Joyce Lalley, Association of Educational Communications and Technology, 1025 Vermont Ave, NW, Suite 820, Washington, DC 20005. Phone: (202) 347-7834; Fax: (202) 347-7839.

Electronic Frontier Foundation (EFF)

This membership organization focuses on policy issues related to national networking. In the K-12 context, EFF concerns itself with policies for determining the resources to which students will have e access. EFF publishes a free newsletter, EFFector Online, on general Internet topics. For policy matters and for membership and publications: (415) 668-7171. Internet for either office: EFF@EFF.ORG.

Institute for the Transfer of Technology to Education (ITTE)

ITTE offers publications, conferences, and seminars for school board members, school board staff, and other educators on the effective use of technology in education. School districts are charged membership according to the size of the district. Institute for the Transfer of Technology to Education (ITTE), National School Boards Association, 1680 Duke Street, Alexandria, VA 22314; (703) 838-6722, contact: Cheryl Williams, director.

International Society for Technology in Education (ISTE), Special Interest Group for Telecommunications (SIG/Tel)

The largest international nonprofit professional organization serving computer-using educators, ISTE is dedicated to the improvement of education through the use and integration of technology. ISTE-Net, an online computer network for ISTE members, is available through GTE Education Services (1-800-927-3000). ISTE also has state affiliates in approximately 30

states. ISTE Membership also includes a subscription to The Computing Teacher magazine, published monthly. The Special Interest Group for Telecommunications publishes a newsletter about telecommunications in education, T.I.E. News. 1787 Agate Street, Eugene, OR 97403-1923; (503) 346-4414. Internet: ISTE@UOREGON.EDU. Program contact for SIG/Tel: Lynne Schrum. Internet: SCHRUMLM@SPLAVA.CC.PLATTSBURGH.EDU.

The Mecklenburger Group

This is an independent consortium serving government and education. Members' experience covers a broad range of education and technology related areas. Subscriptions to a bimonthly publication are available. For further information contact: The Mecklenburger Group, P.O. Box 2075 Alexandria, VA 22304; (703) 823-6853, Fax: (703) 823-6819; Internet: GVSMECK@AOL.COM

NEA School Renewal Network

Dedicated to school reform, this electronic network is intended to create a research base by a community of actively engaged practitioners and researchers. Participants include partners in the center's programs, federally funded research and development laboratories and centers, several research universities, and schools from other national school reform efforts. NEA National Center for Innovation, 1201 16th Street, N.W., Washington, DC 20036; (202) 822-7783. Program contact: Shari Castle.

New Frontiers Program

The National Catholic Education Association (NCEA) operates the New Frontiers Project in conjunction with the University of Dayton. Each year, the NCEA awards scholarships to educators in Catholic schools across the country, who are invited to a conference in Dayton that guides them through a practical process of planning the integration of technology into their school. New Frontiers Program, National Catholic Education Association, 1077 30th Street, N.W., Suite 100, Washington, DC 20007-3852; (202) 337-6232. Contact: Fred Brigham. Internet: brigham@tmn.com

Technical Education Research Centers (TERC)

This program researches, develops, and disseminates innovative programs for educators. A special interest is curriculum projects involving telecomputing. Services include outreach, technical assistance, curriculum guides, and information dissemination. To obtain a copy of TERC's free newsletter, write to: Hands On, 2067 Massachusetts Avenue, Cambridge, MA 02140; (617) 547-0430. Program contact: Ken Mayer. Internet: KEN_MAYER@TERC.EDU.

United States Distance Learning Association (USDLA)

United States Distance Learning Association (USDLA) is a group whose members are involved in the improvement and application of technology for distance learning. The association also publishes ED. Education at a Distance magazine, published 12 times yearly. Subscription is included in membership, which is available for \$100/year. For information call USDLA at (800) 829-3400.

Education Programming

Cable in the Classroom

Cable in the Classroom is an \$81 million project of the cable industry to supply free cable hook-ups and commercial-free programming to schools. To date, 60,000 schools have been hooked up to cable and 24 programming services that provide commercial-free programming with study guides. This is all available free to schools with extended taping rights. A kit and Cable in the Classroom magazine are available by calling (800) 216-2225 (also see Publications section).

NASA TV

NASA TV is a service provided free of charge by NASA. The service provides four hours of programming daily. The programming focuses on mission status of NASA Space Shuttle Missions. During periods with no Shuttle Missions, the programming is primarily education oriented. For further information, including technical specifications, contact: Director, NASA TV, Mail Code P-2, NASA Headquarters, Washington, DC 20546 or phone: (202)-358-1768.

PBS Mathline

PBS Mathline is a program that uses TV, video, and computers to provide instruction in math. The service provides support for students, teachers, parents, policy makers, and the public. MATHLINE will work to help students reach high academic standard in the area of math. The service provides teacher professional development as well as classroom materials for students. For more information contact PBS MATHLINE, 1320 Braddock Place, Alexandria, VA 22314. Phone: (703) 739-5071 Fax: (703) 739-8495.

PBS Video

PBS Video is the distributor for the collection of public television programs on videocassette. A complete 248-page catalog of all available videocassettes is available free of charge to schools, colleges, libraries, and other agencies and organizations by calling the PBS video toll free line (800) 424-7963.

Teacher TV

Teacher TV is a co-production of the National Education Association and The Learning Channel. Airing once a week, the show documents case studies of issues facing teachers in schools, sharing the best educational strategies available around the country. It is an accessible, inexpensive means of professional development for teachers. Teacher TV, National Education Association, 1201 16th Street, N.W., Washington, DC 20036; (202) 822-7715. Contact: Barbara Stein.

Introductory Videotapes

Global Quest: The Internet in the Classroom

A video designed to motivate schools to consider using the Internet, entitled "Global Quest:

The Internet in the Classroom," is available from the NASA National Research and Education Network (NREN) K-12 Initiative. Contact: K-12 NREN Video, Teacher Resource Center, NASA Ames Research Center, Mail Stop T-025, Moffett Field, CA 94035. Internet: GET.VIDEO@QUEST.ARC.NASA.GOV. Fax: (415) 604-3445.

Teaching and Learning with Technology

This video has been prepared by the Association for Supervision and Curriculum Development (ASCD). The video provides an introduction to the Internet, networks, telecommunications, and other applications of technology. Association for supervision and Curriculum Development, 1250 North Pitt Street, Alexandria, Virginia, 22314-1453. (703) 549-9110.

U.S. Department of Education Videotape

A single, free copy of the National Center for Education Statistics-produced videotape, "Experience the Power: Network Technology for Education," may be obtained by writing to: "Experience," NCES, Elementary/Secondary Education Statistics Division, 555 New Jersey Avenue, N.W., Washington, DC 20208-5651, or by faxing your request to (202) 219-1728

Publications

Cable in the Classroom

Cable in the Classroom Magazine enables educators to make full use of cable television. It offers detailed listings of educational programming, sorted by subject area, plus information on support materials, videotapes available for purchase, and information on copyright clearance. Subscriptions are \$18 per year. Many local cable stations make copies available free to educators. Cable in the Classroom Magazine, 86 Elm Street, Peterborough, NH 03458; (800) 216-2225.

Center for Children and Technology

The Center investigates the roles of technology in children's lives "both in the classroom and in general" and the design and development of prototypical software that supports engaged, active learning. It also serves as the New York office for the Education Development Center. The Center for Children and Technology offers a free quarterly newsletter and low-cost publications. Center for Children and Technology, 96 Morton Street, 7th floor, New York, NY 10014; (212) 807-4200. Program contact: Margaret Honey. AppleLink: CTE.BCS. Internet: MHONEY@EDU.ORG

Education SATLINK

Education Satlink is a monthly magazine devoted to the use of satellite technology in classrooms. The magazine discusses ways in which satellites can be used to provide equal access to the highest quality educational programs. Subscriptions are available for \$90 per ten issue year by contacting: Education SATLINK, Missouri School Boards Association, 2100 I-70 Drive Southwest, Columbia, MO 65203, or by calling (800) 234-3376.

Educational IRM Quarterly

Published by the International Society of Technology in Education (ISTE), this magazine is free to all ISTE members. Subscriptions to the quarterly are also available to non-ISTE members. Contact the Order Desk at ISTE, 1787 Agate Street, Eugene, OR 97403-1923 Phone: (800) 336-5191 or fax a request to (503) 346-5890.

Edutopia

A magazine published by the George Lucas Educational Foundation, focusing on projects which use technology to make education more interesting and effective for all students. Requests for free subscriptions should be sent to The George Lucas Foundation, Post Office Box 3494, San Rafael, CA 94912. Phone (415) 662-1600; Fax: (202) 662-1605; Internet: Edutopia@kerner.com.

Electronic Learning Magazine

A magazine focused on the ways technology can be, and is being, used to change and improve schools. Subscriptions are available at \$23.95 per 8 issue year. Requests should be sent to: 555 Broadway, New York, NY 10012; (212) 505-4969.

The InterNIC Newsletter

The InterNIC Newsletter, published by InterNIC Information Services with funding from the National Science Foundation, provides information about networks on Internet -- along with general information about network technology. It can be ordered by contacting InterNIC Information Services, P.O. Box 85608, San Diego, CA 92186-9784; call or fax (619) 455-3990.

The K-12 Network Planning Guide

This guide was compiled by the California State Department of Education. The guide provides a resource for those working to develop curriculum plans. It includes important issues to consider in both planning and implementation. For information, contact Carol Teach, Manager, K-12 Network Planning, California Department of Education; (916) 654-9662.

The Key Elements of Effective State Planning for Educational Technology

Prepared by the Southern Regional Education Board, in collaboration with BellSouth, this guide provides assistance to communities planning uses for educational technology. This publication is focused on the concerns a community should consider while formulating a comprehensive education technology plan. The guide also include tips from the experiences that communities have had with writing these guides. For a copy of the guide, contact Sue Jones at the Southern Regional Education Board (404) 875-9211.

NetTEACH News

A Newsletter for K-12 networking educators. Subscriptions range from \$15-\$35/10 issue year, depending on desired format. All requested should be directed to Kathleen M.

Rutkowski, 13102 Weather Vane Way, Herndon, VA 22071-2944. E-mail should be sent to: INFO@NETTEACH.CHAOS.COM

Technology and Learning

This is a magazine that discusses developments across a broad range of issues in education and technology. Subscriptions are available for \$24 per nine issue year. For subscription information contact: Technology & Learning, 330 Progress Road, Dayton, OH 45449.

TECHNOS Quarterly is a forum for the discussion of ideas about the use of technology in education. Featured interviews, articles, and opinion essays offer analyses of trends, research, and development in education, policy, and technology. Subscriptions are \$20 for individuals, \$16 for libraries (including media centers). **TECHNOS Quarterly**, Agency for Instructional Technology, Box A, Bloomington, IN 47402; (812) 339-2203. Contact: Carole Novak, editor.

Using Technology to Support Education Reform and Network Technology for Education. Both reports were published by the U.S. Department of Education in 1993. The first report outlines ways in which technology can be used to support education reform. The second is an overview of ways in which network technology can be used in education settings. Both are available from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, D.C. 20402-9328; (202) 783-3238.

Technology and Education Reform: The Reality Behind the Promise. This book provides concrete illustrations of how technology can support school reform, specific kinds of promising technologies, and how technology can help both students and teachers accomplish tasks. To order contact: Barbara Means, Ed., SRI International, 333 Ravenswood Avenue, Menlo Park, CA 94025-3493; (415) 326-6200.

State Baselines for Goals 2000 Implementation. This report contains detailed and descriptive information about State and regional activities grouped by the ten regions of the Regional Educational Laboratories that are relevant to Goals 2000. To order contact: Council of Chief State School Officers, One Massachusetts Ave., N.W., Washington, DC 20001; (202) 408-5505.

The Office of Technology Assessment has produced a series of reports with valuable information: Linking for Learning, Power On!, Rural America at the Crossroads, Networking for the Future, and Adult Literacy and New Technologies: Tools for Learning. They are available at cost from the Government Printing Office (GPO), Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328; (202) 783-3238.

Funding Sources

The USDLA Funding Source Book for Distance Learning and Educational Technology

The USDLA Funding Source Book is a publication listing hundreds of funding sources for technology. It is available for \$39.50 plus \$4.00 shipping. To order contact: (718) 857-3717.

Educator's Guide for Developing and Funding Educational Technology Solutions

This guidebook takes educators through the proposal process and includes a sample proposal evaluation report. To order contact: (415) 344-3604.

Directory of Building and Equipment Grants

This directory lists funding sources for equipment, building and renovation and innovative procedures to secure funding for computers and free computer software. To order contact: (407) 795-6129.

Federal Register

This daily publication contains notices of new grants from federal agencies, grant application guidelines, and regulations and requirements for federal grant programs. To order contact: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

In addition, Check with your State Department of Education, and with the Federal Programs listed in the next section.

United States Federal Government Agency Resources

U.S. Department of Education

Access to U.S. Department of Education Information On-line

People with access to the Internet can tap a rich collection of education related information at the U.S. Department of Education's (ED) public Gopher/FTP/World Wide Web site, including: general information about the Department, funding opportunities, descriptions of ED programs, directories of effective programs, directory of education-related information centers, full-text publications, statistical tables, charts, and data sets, and pointers to public Internet resources at R&D centers, Regional Labs, ERIC Clearinghouses and other ED-funded institutions. The Department's Internet site is maintained by the Office of Educational Research and Improvement (OERI). Internet users can access the information using a gopher client (gopher to gopher.ed.gov or select North America→USA→General→U.S. Department of Education), and FTP client (ftp to ftp.ed.gov; logon anonymous) or a World Wide Web client such as NSCA Mosaic (URL=<http://www.ed.gov>).

In addition, OERI operates a toll-free electronic bulletin board. Statistical data, research findings and Department of Education information are all available on-line. Computer users can retrieve this information at any hour using a modem (at speeds up to 14,400 baud) and calling 1-800-222-4922. Finally, the Department's Grants and Contracts Service operates ED board, which provides on-line access to information about the Department's programs, current funding opportunities, and other information. Computer users can access ED board at any hour by using a modem (at speeds up to 2400 baud) and dialing (202) 260-9950.

ERIC Clearinghouse on Information & Technology (ERIC/IT)

ERIC/IT is one of 16 clearinghouses in the ERIC System, sponsored by the Office of Educational Research and Improvement, U.S. Department of Education. ERIC/IT specializes in educational technology and library/information science and processes documents in these areas for the ERIC database, the worlds largest bibliographic database. The clearinghouse also provides user services and publications related to its scope areas, including the ERIC Networker, and electronic "help sheets" for using ERIC resources on the Internet.

In addition, ACCESS ERIC, the ERIC System's outreach and promotion component, maintains a bulletin board on America Online. Available through the Teachers' Information Network of the Learning and Reference folder, it includes general information about ERIC, the full text of brochures for parents and teachers, information packages with research syntheses and ERIC database searches, product announcements, and a message center. Call 1-800-LET-ERIC for more information. 4-194 Center for Science and Technology, Syracuse University, Syracuse, NY 13244-4100; (315) 443-3640. Program contact: Nancy Preston.

AskERIC

ERIC/IT recently began piloting an Internet-based question-answering service called "AskERIC." Teachers, administrators, parents, and community members with education questions may send them via e-mail to ASKERIC@ERICIR.SYR.EDU. A response, drawn from the ERIC database, will be provided within 48 hours. AskERIC has also developed computerized resource collections of frequently-asked-questions, lesson plans (including those from PBS' Newton's Apple and CNN Newsroom), short summaries of recent research, and literature searches on popular topics.

Eisenhower National Clearinghouse for Mathematics and Science Education Projects

Ohio State University received a 5-year grant in 1992 to establish this clearinghouse, through which K-12 educators may access material and information, such as program or curriculum resources, federal funding, evaluations, and guides on math and science. By 1994, an electronic catalog will be available on CD-ROM and online. By 1996, the entire database will be searchable online, and a user network will be in place. Eisenhower National Clearinghouse, 104 Research Center, 1314 Kinnear Road, Columbus, OH 43214; (614) 292-1348. Contact: Chris Putnam.

Star Schools Program

The Star Schools Program is a discretionary grant program that supports telecommunications partnerships to provide telecommunications equipment and programming to schools. Through support from the Star Schools Program, more than 50,000 teachers along with a host of administrators, parents, and policy makers have participated in staff development and community awareness activities produced via satellite, compressed video technology, fiber optics, videodisc, and microcomputer-based networks. Each year the number of schools participating in live, interactive, instructional programs offered via distance education nearly doubles. The Star Schools program also supports four dissemination grants to establish clearinghouses of information about distance learning. The next round of competitions for Star Schools grants is in the spring of 1994. Approximately \$22 million will be available for these grants. Star Schools, U.S. Department of Education, Office of Educational Research and Improvement, 555 New Jersey Avenue, N.W. Washington, D.C. 20208; (202) 219-2116
Contact: Cheryl Garnette.

Regional Educational Laboratories

The Department of Education's Regional Educational Laboratories work in partnership with educators and policy makers to test, adapt, and incorporate research findings into improved programs for schools and their students. Several of the regional labs also publish resource guides of their own that include information on activities of communities in the region. Those labs that may not have made technology a particular focus will have access to the resources from the other labs. The resource guides, as well as the labs in general, can be an important source for local contacts. The following is a listing of all of the laboratories and the states that they serve:

Appalachia Educational Laboratory

1031 Quarrier Street
PO Box 1348
Charleston, WV 25325
(800) 624-9120
Serves KY, TN, VA, WV
Contact: Pamela Lutz

Far West Laboratory

730 Harrison Street
San Francisco, CA 94107-1242
(415) 565-3000
Serves AZ, CA, NV, UT
Contact: Jim Johnson

Mid-continent Regional Educational Laboratory

2550 S. Parker Road, Suite 500
Aurora, CO 80014

(303) 337-0990
Serves CO, KS, MO, NE, ND, SD, WY
Contact: Sandra Berger

The Regional Laboratory for Educational Improvement of the Northeast and Islands
300 Brickstone Square, Suite 900
Andover, MA 01810
(508) 470-0098
Serves CT, ME, MA, NH, NY, PR, RI, VT, U.S. Virgin Islands
Contact: Janet Angelis

North Central Regional Educational Laboratory
1900 Spring Road, Suite 300
Oak Brook, IL 60521
(708) 571-4700
Serves IL, IN, IA, MI, MN, OH, WI
Contact: Marianne Kroeger

Northwest Regional Educational Laboratory
101 SW Main Street, Suite 500
Portland, OR 97204-3297
(503) 275-9500
Serves AK, ID, MT, OR, WA
Contact: Jerry Kirkpatrick

Pacific Regional Educational Laboratory
1164 Bishop Street, Suite 1409
Honolulu, HI 96813
(808) 533-6000
Serves American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of
Micronesia, Guam, Hawaii, Marshall Islands, Palau
Contact: Kay Noguchi

Research for Better Schools, Inc.
444 N. Third Street
Philadelphia, PA 19123-4107
(215) 574-9300
Serves DE, DC, MD, NJ, PA
Contact: Keith Kershner

Southeastern Regional Vision for Education
University of North Carolina at Greensboro
P.O. Box 5367

Greensboro, NC 27435-5367
(800) 755-3277
Serves AL, FL, GA, MS, NC, SC
Contact: Joe Follman

Southwest Regional Development Laboratory
211 East Seventh Street
Austin, TX 78701
(512) 476-6861
Serves AR, LA, NM, OK, TX
Contact: Joe Schneider

Technology Resources Center

The Technology Resources Center is a demonstration site for the application of technology to all levels of education, located two blocks from Union Station in Washington, D.C. Interactive video discs, CD-ROM discs, IBM and Apple computers, and a variety of software are available for demonstration. Appointments are requested. Presentations can be tailored to individual or group needs. Technology Resources Center, U.S. Department of Education, 555 New Jersey Avenue, N.W., Washington, DC 20208; (202) 219-1699, Contact: Sheldon Fisher.

National Science Foundation (NSF)

The Applications of Advanced Technology Program provides grants to examine the strengths and weaknesses of new, innovative applications of advanced technologies, and to lay the foundations and knowledge necessary for the use of new, revolutionary computer and telecommunications systems and related technologies for teaching and learning science and mathematics. Applications of Advanced Technology Program, National Science Foundation, 4201 Wilson Blvd., Arlington, VA 22230; (703) 306-1651, ext. 5887, Contact: Nora H. Sabelli, Program Director.

The Networking Infrastructure for Education Program (NIEP) provides grants to alliances of academic institutions, school districts, professional societies, state agencies, and others concerned with education reform to complete policy studies and research, development and demonstration projects related to the role of electronic networks in support of reformed education. National Science Foundation, 4201 Wilson Blvd. Arlington, VA 22230; (703) 306-1651, ext. 5887, Contact: Nora H. Sabelli.

The Teacher Enhancement Program (TE) seeks to improve, broaden, and deepen the interdisciplinary and pedagogical knowledge of teachers, administrators, and others who play significant roles in providing quality mathematics, science, and technology education for

students from pre-kindergarten through grade 12. To this end, TE promotes systemic change, in-service teacher development, dissemination, and other activities. National Science Foundation, 4201 Wilson Blvd., Arlington, VA 22230; (703) 306-1651, ext. 5887, Contact: Nora H. Sabelli.

The National Science Foundation's Network Service Center (NNSC) collects, maintains, and distributes information about NSFNet and provides assistance to networking end users. NNSC maintains the Internet Resource Guide, which is available through anonymous file transfer protocol at NNSC.NSF.NET, directory resource-guide. This and other resources can also be obtained by sending e-mail to INFO-SERVER@NNSC.NSF.NET, and typing in the body of the message: Request: info, Topic: help. NNSC also offers network assistance through e-mail and a telephone hotline. 10 Moulton Street, Cambridge, MA 02138; Hotline: (617) 873-3400. Internet help: NNSC@NNSC.NSF.NET. Program contact: Corinne Carroll.

Merit Network, Inc., which operates the NSFNet backbone, also provides information support services to the networking community through e-mail or telephone. Staff offer help in using the Internet and information about K-12 connections and resources. Merit organizes conferences on networking, and publishes a free newsletter, Link Letter, which can be requested through e-mail to NSFNET-LINKLETTER-REQUEST@MERIT.EDU. To obtain hard copies, write to the organization. Merit Network, Inc., 2901 Hubbard, Pod G, Ann Arbor, MI 48105-2016; 1-800-66-MERIT or (313) 936-3000. Internet: NSFNET-INFO@MERIT.EDU, JMURRAY@PSG.COM.

The Department of Energy

The Department of Energy's National Laboratories provide educational experiences for students and training to teachers in communities near the 30 National Laboratories. The programs cover mathematics and all of the physical sciences. In fiscal year 1992, there were 515 programs operated by the National Laboratories, serving 400,000 students and 30,000 teachers. An annual guide to these programs is available at the following address: Office of University and Science Education, U.S. Department of Energy, 1000 Independence Avenue, N.W., Room 3F-042, Washington, DC 20585; (202) 586-8949, Contact: Dr. Richard Stephens, director.

The Department of Commerce

The Public Telecommunications Facilities Program (PTFP) awards matching grants to non-commercial entities to purchase telecommunications equipment, with the stipulation that the equipment be used for educational or cultural purposes. PTFP also provides smaller grants to assist these entities in planning for the purchase and use of telecommunications equipment. In fiscal year 1994 (beginning October 1, 1993) approximately \$20 million will be available for

both types of grants. Public Telecommunications Facilities Program, National Telecommunications and Information Administration, U.S. Department of Commerce, Washington, DC 20230; (202) 482-5802 Contact: Richard P. Harland, senior program director.

The Telecommunications and Information Infrastructure Application Program (TIIAP) awards grants to state and local governments and nonprofit organizations for the planning and construction of telecommunications networks for the provision of educational, cultural, health care, public information, public safety and other social services. In FY 1994, \$26 million has been appropriated for the program. Approximately \$100 million will be available in 1995. National Telecommunications and Information Administration, U.S. Department of Commerce, Rm. H-4889, Washington, D.C. 20230; (202) 482-2048. Contact: Dr. Charles M. Rush; email: tiiap@ntia.doc.gov.

National Aeronautics and Space Administration (NASA)

NASA provides training and educational experiences for students and teachers related to aeronautics and space technology, and operates 10 Teacher Resource Centers. National Aeronautics and Space Administration, Technology and Evaluations Branch, 300 E Street, S.W. Mail Code FET, Washington, DC 20546-0001; (202) 358-1540 Contact: Dr. Malcom Phelps.

NASA provides an on-line service called **Spacelink**, which offers news about current NASA programs, lesson plans and activities for educators and students, available via modem at (202) 895-0028.

NASA Select features daily satellite TV programs, including "NASA Today" TV News, educational programs, live coverage of space shuttle missions, and videotapes on aerospace. Available on C-Band, SatCom F-2R, Channel 13, and on participating cable systems.

NASA publishes a catalog, *Software for Aerospace Education*, which lists software and videodiscs for astronomy and space exploration. It is available at (202) 358-1540.

NASA's satellite video teleconferences are available free to educators with access to satellite facilities. For site registration, write to: NASA Aerospace Education Services Program, Video Teleconference Site Registration, 300 N. Cordell, Oklahoma State University, Stillwater, OK 74078-0422. Contact: Rick Rollin. The teleconferences and a catalog are available at cost on videotape from: NASA CORE/Lorain County JVS, 15181 Route 58 South, Oberlin, OH 44074. (216) 774-1051 x293.

Teacher Resource Centers

NASA maintains collections of resources for use by teachers in 10 centers. The resources include video and audio tapes, software, and laser discs. NASA is working to ensure the TRCs have the training and support that they need to be capable of modeling the benefits of internet access to teachers.

Alabama Space and Rocket Center
Attn: Teacher Resource Room
Tranquility Base
Huntsville, AL 35807
(205) 544-5812
Serves AL, AK, IA, LA, MO, TN

NASA Ames Research Center
Attn: Teacher Resource Center
Mail Stop: To-25
Moffett Field, CA 94035
(415) 694-6077
Serves AK, AZ, CA, HI, ID, MT, NV, OR, UT, WA, WY

NASA Dryden Flight Research Facility
Serves CA

NASA Goddard Space Flight Center
(301) 344-8981
Serves CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT

NASA Jet Propulsion Laboratory
(818) 354-6916
Serves CA, U.S. States and Territories

NASA Lyndon B. Johnson Space Center
(713) 483-8696
Serves CO, KS, NE, NM, ND, OK, SD, TX

NASA Kennedy Space Center
(305) 867-4090
Serves FL, GA, PR, Virgin Islands

NASA Langley Research Center
(804) 864-3293
Serves KY, NC, SC, VA, WV

NASA Lewis Research Center
(216) 433-2017
Serves IL, IN, MI, MN, OH, WI

NASA John C. Stennis Space Center
(601) 688-3338
Serves MS

Wallops Flight Facility
(804) 824-1176
Serves Eastern VA and MD

Also planned are a series of training videos with accompanying booklets for the educational end user on how to use e-mail, gopher, wais, and other network tools.

U.S. Department of Agriculture (USDA)

The Extension Service of USDA as well as many of its land grant university partners have a wealth of material available electronically for student use. Most of this is available through **Almanac** (USDA's mail-enabled file server and Gopher). Many more resources are in the process of being added to the network. A guide called **Exploring the Internet** is updated frequently. Many Extension specialists are networked and can provide E-Mail responses to inquiries. USDA's Extension Service is working toward an electronic mail directory, already available in many states, that includes both state- and county-level expertise in agriculture, nutrition, health, science, and other topics.

The **Agricultural Telecommunications** program provides funding for the use of telecommunications in rural and urban areas, and may fund proposals if done jointly with land grant institutions. Contact the Agricultural Communications Program, U.S. Department of Agriculture, 14th and Independence Avenue, S.W., Washington, DC 20250. (202) 720-6084.

Final Note:

It is important to point out that this guide is far from complete. It is intended to provide the first step for communities who are considering the use of technology for comprehensive school reform. The resources listed here have been chosen as representative of the countless tools available to teachers and administrators who are considering this important issue. Educational technology is growing so rapidly, that it is literally impossible to keep an updated list of all resources that are available. Further, many of the questions raised by a consideration of the implementation of technology in education are unique to each district and each community. The answers to these question can best be answered through local discussions. Hopefully, this

list, in conjunction with resources in your area, will provide the assistance necessary for vital planning and implementation of technology and education reform.

This resource guide was originally prepared by the Department of Education's Director of Education Technology, Office of the Deputy Secretary, as part of The Secretary's Satellite Town Meeting on Educational Technology (October 19, 1993).

Please send comments and suggestions regarding this resource guide to:

Jonathan Hoyt
Office of Educational Technology
United States Department of Education
600 Independence Ave, SW
Washington, DC 20202-0500
(202) 205-0755
e-mail: JONATHAN_HOYT@ED.GOV



U.S. Department of Education Technology Initiatives

EDUCATIONAL TECHNOLOGY

Through projects initiated under the Improving America's Schools Act and through long-term programs, the Department of Education promotes the use of technology in schools, libraries, and communities to achieve its mission of ensuring equal access to education and promoting educational excellence throughout the nation.

National Long-Range Plan for Technology in Education

In accordance with the requirements of section 3121 of P.L. 103-382 of the Improving America's Schools Act of 1994, the Secretary of Education will submit a National Plan for Technology in Education to Congress in October. The planning process has brought together hundreds of educators, citizens, and industry leaders in seven regional forums, two national conferences, dozens of interagency meetings, and on-line discussions over the Internet. The plan will galvanize local, State, and federal investments in technology and will propose to leverage resources for teacher training, access to technology, and school reform. Contact Linda Roberts 202-401-1444

National Challenge Grants for Technology in Education

As catalysts for change, challenge grants support communities of educators, parents, industry partners, and others who are working to transform their schools into information age learning centers. Challenge grants support the development and innovative use of technology and new learning content. Each grant focuses on integrating innovative learning technologies into the curriculum and leverages federal dollars to establish local consortia of communities committed to school reform and technology integration. Contact Thomas Carroll 202-708-6001

Regional Technical Assistance Consortia

Six consortia of technical assistance providers help to states, local educational agencies, teachers, school library and media personnel, administrators and other education entities to integrate advanced technologies into kindergarten through 12th grade classrooms, library media centers, and other educational settings (including adult literacy centers). Consortia will establish and conduct regional activities that address professional development, technical assistance, and information resource dissemination to promote the effective use of technology in education, with special emphasis on meeting the documented needs of educators and learners in the region they serve; and foster regional cooperation. Contact Catherine Mozer 202-219-8070

Star Schools Program

Since 1988, the Star Schools distance learning projects have helped to improve instruction in mathematics, science, and foreign languages, literacy skills and vocational education. They serve underserved populations, including the disadvantaged, illiterate, limited-English proficient, and individuals with disabilities. Partnerships develop, construct, acquire, maintain and operate telecommunications audio and visual facilities and equipment; develop and acquire educational and instructional programming; and obtain technical assistance for the use of such facilities and instructional programming. Contact Jean Tolliver 202-219-2097.

Ready-To-Learn Television

Ready-To-Learn Television supports development of educational television and instructional video programming for pre-school and elementary school children and their parents in order to promote the achievement of the National Education Goals. The grant to the Corporation for Public Broadcasting will develop video programs for children with support materials for parents. Contact Joe Caliguro 202-219-1496

Telecommunications Demonstration Project for Mathematics

This demonstration carries out a national telecommunications-based project to improve the teaching of mathematics and is designed to help elementary and secondary teachers in preparing all students for achieving state content standards. One grant for \$1.1 million was awarded to PBS Mathline in FY '95. Approximately 2100 teachers of grades K-5 will participate through 69 public television stations in 34 states. Additional support is also given to develop local programs for technical support for Mathline teachers. Contact Adria White 202-219-2181

Technology Media and Materials for Individuals with Disabilities

The Technology Media and Materials Program supports a variety of research development, and activities to develop, examine, and market technology to serve children with disabilities. The program's purpose is to advance the use of innovative technology, media, and materials in improving educational results for children with disabilities. Contact Louis Danielson 202-205-8106

Public Library Construction and Technology Enhancement

This program, part of the Library Services and Construction Act (LSCA), provides funding to states for construction of public libraries; acquisition, remodeling, and alteration of existing buildings; purchase, lease and installation of equipment, including technology; meeting handicapped barrier standards; and purchasing historic buildings for use as libraries. SAILOR, a non-commercial Internet service run by the Maryland library system was developed under this program. In 1993, Louisiana received two grants to fund a comprehensive statewide library network serving state agencies, higher education, public libraries and K-12 schools. Contact Neal Kaske 202-219-1303

Regional Education Laboratories

The Department of Education's Regional Educational Laboratories work with educators and policy makers to test, adapt, and incorporate research findings into improved programs for schools and their students. Several of the regional labs publish resource guides that include information on activities of communities in their region. Some Labs have made technology a particular focus; all labs will have access to the resources of the others. The Labs and resource guides can be an important source for local contacts. Contact Robert Stonehill 202-219-2088

National Center on Education Statistics Survey on School Connectivity

The first national survey of school's access to broad band telecommunications and the Internet was completed in the fall of 1994. A second national survey to be conducted in October 1995 will document the progress being made to wire schools and classrooms. Contact Gerald Malitz 202-219-1364

Research and Development

Among other priorities, the Department's Office of Educational Research and Improvement (OERI) addresses the issues of technology's impact on teaching and learning, and in an interagency collaboration, has identified four high-priority areas. These are research on learning and cognitive processes to improve the understanding of the learning process and how technology can best support that process; new models for evaluating learning and learning productivity; development of high-quality, affordable learning tools and environments for use in a variety of settings including schools, workplaces, and homes; and demonstrations of innovative technology and networking applications on how the NII can be used for advanced instructional systems. Contact Carol Lacompagne 202-219-2064

Technology Opportunities in Other Programs

Under the Title I formula grants program, vocational and adult education, the School-to-Work program and the Eisenhower Professional Development funds for hardware and software purchases and professional development for technology is possible.

U.S. Department of Education's public World Wide Web / Gopher / FTP site

People with access to the Internet can tap a rich collection of education-related information including general information about the Department, funding opportunities, descriptions of ED programs, directories of effective programs, a directory of education-related information centers, full-text publications (including legislation), statistical tables, charts, data sets, and pointers to public Internet resources at R&D Centers, Regional Labs, ERIC Clearinghouses and other Department-funded institutions. The Department's Internet site is maintained by the Office of Educational Research and Improvement (OERI). Internet users can access the information using a World Wide Web client such as NCSA Mosaic (URL=<http://www.ed.gov>), a gopher client (gopher to gopher.ed.gov or select North America -> USA-> General -> U.S. Department of Education), or an FTP client (FTP to ftp.ed.gov; log on anonymous).

AskERIC Virtual Library

The AskERIC Virtual Library is an Internet site of selected resources for education and general interest. Some of the contents include over 700 lesson plans, access to the ERIC database and full-text ERIC Digests. AskERIC InfoGuides (topical guides to Internet and ERIC resources), archives of education-related listservs, and remote access to other Internet sites. To access the AskERIC Virtual Library, by World Wide Web client (URL=<http://www.ericir.syr.edu>); a gopher client (gopher to gopher.ericir.syr.edu) or select North America -> USA-> General -> AskERIC; by telnet to ericir.syr.edu, login as gopher, hit <enter> to bypass password prompt; or by FTP client (FTP to ftp.ericir.syr.edu, log on anonymous, and for password enter your email address).

National Parent Information Network

The National Parent Information Network (NPIN) is the largest Internet resource for parents, providing high quality information devoted to child development, child care, education, and parenting. NPIN publishes an online newsletter for parents that contains timely information on issues of concern to parents, special reports on children by age group, and documents on relevant issues. Access NPIN at URL=<http://www.prairienet.org/htmls/eric/npin/npinhome.html>

What's New!

Technology Resources

Through projects initiated under the Improving America's Schools Act and through long-term programs, the Department of Education promotes the use of technology in schools, libraries, and communities to achieve its mission of ensuring equal access to education and promoting educational excellence throughout the nation.

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- o Linda Roberts, (202) 401-1444

National Center on Education Statistics Survey on School Connectivity

The first national survey of schools' access to broad band telecommunications and the Internet was completed in the fall of 1994. A second national survey will begin in October, 1995 and will document the progress being made to wire schools and classrooms.

- o Gerald Malitz, 219-1364

National Challenge Grants for Technology in Education

This program awards grants to consortia including at least one local education agency with a high percentage of children living below the poverty line. Promotes the integration of the acquired technologies into curricula to help the local educational agency enhance teaching, training, and student achievement; promotes ongoing, sustained professional development for teachers, administrators, and school library media personnel served by the local educational agency to further the use of technology in the classroom or library-media center; and leads to the successful, effective, and sustainable use of technologies acquired.

- o Tom Carroll, (202) 706-6001

Public Library Construction and Technology Enhancement

This program, part of the Library Services and Construction Act (LSCA), provides funding to states for construction of public libraries; acquisition, remodeling, and alteration of existing buildings, purchase, lease and installation of equipment, including technology; meeting handicapped barrier standards; and purchasing historic buildings for use as libraries. SAILOR, a non-commercial Internet service run by the Maryland library system was developed under this program.

- o Neal Kaske, (202) 219-1303

Ready To Learn Television

Ready-To-Learn Television supports development of educational television and instructional video programming for pre-school and elementary school children and their parents in order to promote the achievement of the National Education Goals. The grant to the Corporation for Public Broadcasting will develop new video programs for children with support materials for parents.

- o Joe Caliguro, (202) 219-1496

Regional Education Laboratories

The Department of Education's Regional Educational Laboratories work in partnership with educators and policy makers to test, adapt, and incorporate research findings into improved programs for schools and their students. Several of the regional labs publish resource guides that include information on activities of communities in their region. Some Labs have made technology a particular focus; all labs will have access to the resources of the others. The Labs and resource guides can be an important source for local contacts. For a listing of the Regional Education Laboratories, refer to page 71 in the resource section of this book.

- o Robert Stonehill, (202) 219-2088

Regional Technology Consortia

These six consortia of technical assistance providers help states, local education agencies, teachers, school library and media personnel, administrators and other education entities to integrate advanced technologies into kindergarten through 12th grade classrooms, library media centers, and other educational settings (including adult literacy centers). Consortia will establish and conduct regional activities that address professional development, technical assistance, and information resource dissemination to promote the effective use of technology in education, with special emphasis on meeting the documented needs of educators

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and learners in the region they serve; and will foster regional cooperation and resource course work sharing. (AWARDS ARE PENDING: ADDRESSES OF THE INDIVIDUAL CONSORTIA WILL BE AVAILABLE THROUGH THE CONTACT BY NOVEMBER 1.)

- o Catherine Mozer, (202) 219-8070

Research and Development

Among other priorities, the Department's Office of Educational Research and Improvement (OERI) addresses the issues of technology's impact on teaching and learning, and in an interagency collaboration, has identified four high-priority areas. These are research on learning and cognitive processes to improve the understanding of the learning process and how technology can best support that process; new models for evaluating learning and learning productivity; development of high-quality, affordable learning tools and environments for use in a variety of settings including schools, work places, and homes; and demonstrations of innovative technology and networking applications on how the NII can be used for advanced instructional systems.

- o Carol B. Lacampagne, (202) 219-2064.

Special Education Technology Media and Materials

The Technology Media and Materials Program supports a variety of research development, and activities to develop, examine, and market technology to serve children with disabilities. The program's purpose is to advance the use of innovative technology, media, and materials in improving educational results for children with disabilities.

- o Office of Special Education and Rehabilitative Services, (202) 205-8123.

Star Schools Program

The Star Schools Program is a discretionary grant program that supports telecommunications partnerships to provide telecommunications equipment and programming to underserved students, including those living in rural and urban areas. Through support from the Star Schools Program, more than 50,000 teachers along with a host of administrators, parents, and policy makers have participated in staff development and community awareness activities produced via satellite, compressed video technology, fiber optics, videodisc, and microcomputer-based networks.

- o Jean Tolliver, (202) 219-2097

Teacher Networking Projects

The Technology Education Program is designed to enhance curricula, classroom teaching and teacher professional development through online use of electronic teacher networks and shared knowledge. The teacher networks link teachers with curriculum and instruction specialists who can help teachers improve their teaching skills and knowledge of subject matter.

- o Tawanna Colbert, (202) 219-2143 or tcolbert@inet.ed.gov

Technology, Educational Media, and Materials for Individuals with Disabilities

This project funds projects and centers for advancing the use of new technology, assistive technology, media, and materials in the education of children and youth with disabilities and the provision of early intervention services to infants and toddlers with disabilities.

- o Louis Danielson, (202) 205-8106

Telecommunications Demonstration Project for Mathematics

This demonstration carries a national telecommunications-based project to improve the teaching of mathematics and is designed to help elementary and secondary teachers in preparing all students for achieving state content standards. Approximately 2100 teachers of grades K-5 will participate through 69 public television stations in 34 states. Additional support is also given to develop local programs for technical support for Mathline teachers.

- o Adria White, (202) 219-2181

UNITED STATES
DEPARTMENT OF EDUCATION



Anderson
NEWS

FOR EMBARGOED RELEASE: 9 a.m. EDT
October 10, 1995

Contact: Melinda Kitchell Malico
(202) 401-1008

NOTE: Secretary Riley will be available via conference call Tuesday at 11 a.m. and 2 p.m. EDT to talk with reporters about the grants. Call (800) 495-0245, SCHOOLS (724-6657)

**PRESIDENT SAYS TECHNOLOGY CHALLENGE GRANTS WILL HELP
BUILD 21ST CENTURY SCHOOLS**

WASHINGTON, Oct. 10 -- President Clinton today announced the first installment on a five-year commitment to move the nation's schools into the Information Age.

Flanked by Vice President Gore, Education Secretary Richard Riley and corporate leaders, the President announced 19 Challenge Grants for Technology in Education. The awards, totaling \$9.5 million, are going to community partnerships with matching commitments of more than \$70 million in the first year and over \$300 million during the five-year span of the projects.

"Everywhere we look, technology is changing the way we work and live," President Clinton said. "Now, more than ever, it is imperative that our nation's schools have the technology they need to prepare students for the 21st century.

"The recipients of these challenge grants and their partners are committed to developing creative responses to the Information Age requirements of all students, including those in inner cities and rural areas. These grants will support visionary educators, parents, business partners and community leaders who are working to retool their schools for the future."

-MORE-

The challenge grant partnerships -- local consortia comprised of school districts and 380 partners representing business, education, libraries, museums, the military, states and cities -- will help infuse powerful new technologies into schools, allowing students and teachers to join the information superhighway. The partners have made substantial commitments for equipment, software development, technical support, telecommunications services and other costs.

"Powerful new technologies and the information superhighway can create unparalleled possibilities for extending the time, place and resources for learning," Riley said. "By linking schools to homes, libraries, museums, community centers and the workplace, these partnerships will expand learning opportunities for all students. The challenge grant communities being announced today will make these connections a reality -- and open schools to the abundance of educational resources available around the world."

The 19 grant recipients have formed partnerships with more than 134 other school districts in 23 states in the first year of the grant cycle. The partnerships also include more than 120 businesses, 34 universities and colleges, 10 museums, five libraries, 10 state education departments, education offices in five national and a state park system, two regional education laboratories, an energy laboratory, a Naval base and an Army base, and state and local government offices.

"These communities are responding to an ambitious challenge," Riley said. "Classrooms should be modern information centers for learning, yet most instruction still takes place with black boards and chalk. The implications for education and economic

competitiveness are enormous. Employers need well-educated employees who can use information technologies to gain knowledge and improve productivity. These grants will help schools and corporate partners make technology a part of effective teaching and learning."

First-year support for the projects comes from both fiscal year 1995 and 1996 funds; the grants announced today are funded with FY 95 funds. The Clinton administration is seeking Congressional support to fully fund the five-year grants at more than \$85 million. Clinton requested \$70 million for FY 96, but the House has recommended just \$25 million and the Senate is considering funding of \$15 million.

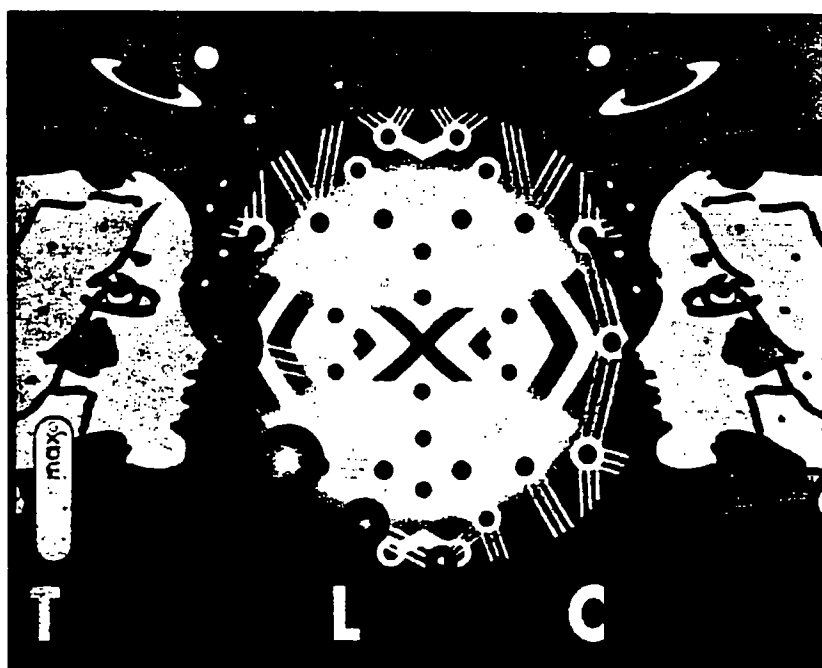
"At a time when hundreds of communities across the country are expressing their desire to meet the challenge of bringing their schools into the information age, it is tragic that Congress is considering cuts in this program, which would provide the resources they need for an effective response," Riley said. "Each federal dollar committed to this program is generating over \$3 of additional local community investment in the future of our children. This is an investment in education and our future economic competitiveness that should not be lost."

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NOTE TO EDITORS: Attached is a list of grantees.

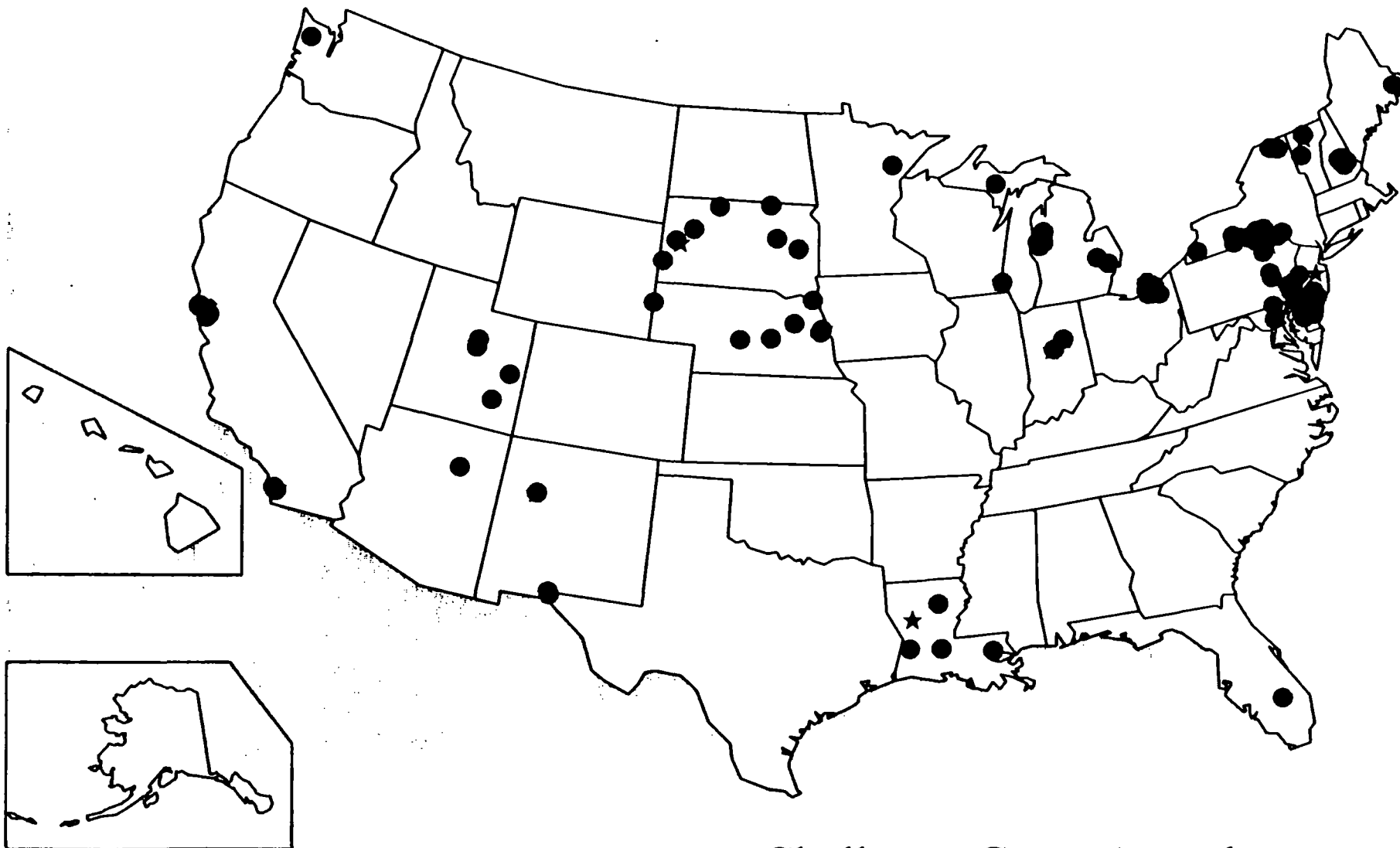
Challenge Grants for Technology In Education

GRANT ABSTRACTS
FY 1995



Interagency Learning Technology Office
U.S. Department of Education
Suite 6300
1250 Maryland Ave., S.W.
Washington, D.C. 20202-5544
202-708-6001

Prepared by William Anderson
National Aeronautics and Space Administration



Challenge Grant Awards

● 134 Partner School Districts ★ 19 Challenge Grant Districts

Technology Learning Challenge Grants

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CHALLENGE GRANTS FOR TECHNOLOGY IN EDUCATION

The U.S. Department of Education is awarding \$9.5 million in Challenge Grants for technology in education to 19 communities in 16 states across the country. The 19 school districts in these communities will work in partnerships with a total of 134 other school districts in 23 states. These school districts will be using powerful new technologies and the information superhighway to transform their factory era schools into information age learning centers.

Challenge Grants will average \$1 million a year for five years. During the first year, one and a quarter million students will be served by these grants, and the number of students served will grow each year during the life of the projects.

In each Challenge Grant community a consortium of schools, businesses, libraries, museums and community organizations are matching the grant with substantial commitments for equipment, software development, technical support, telecommunications services and other costs. These Challenge Grant communities are making a significant educational investment in the future of their children. The total value of matching commitments is over \$70 million in the first year, and during the five year life of these projects the total value of these investments is expected to be over \$300 million. Funds awarded through the Challenge Grants will augment these local investments and support new curriculum design, teacher training, and the evaluation of educational effectiveness.

Over 380 partners will participate in the activities of these nineteen Challenge Grant communities. A total of 153 school districts will use new technologies for education reform. Over 120 business firms are participating in Challenge Grant community partnerships, along with 34 universities and colleges, ten museums, five libraries, nine State Education Agencies, the education offices of five national parks and a state park system, two regional education laboratories, an energy laboratory, a Navy base, an Army base, three Governor's Offices, and two Mayor's offices. Of the participating school districts 78 are urban and 70 are rural. The rural school districts include eight Bureau of Indian Affairs schools. Of the 120 businesses committed to these partnerships, 14 are hardware manufacturers; 12 are software developers; and 18 are telecommunications firms. Additional school districts, firms, and community organizations are encouraged to join these partnerships in the future.

Nineteen local school districts, one in each community, will administer these grants. A list of the school districts is attached, along with a map designating the locations of the 19 Challenge Grant communities and the rest of the 134 participating school districts. A one page abstract of each Challenge Grant community's initiative is also attached.

These communities are responding to an ambitious challenge. Everywhere we look, technology is changing the way we work and live -- everywhere, that is, but in our schools and classrooms. In classrooms that should be modern information centers for learning, the basic media of instruction continue to be black boards and chalk. The implications for education and economic competitiveness are enormous. In a strong economy, employers must have well-educated employees who make skillful use of information technologies to increase their knowledge and continuously improve their productivity. But few schools today are able to provide the high performance learning tools that would allow students to develop these skills.

As catalysts for change, challenge grants will support communities of educators, parents, industry partners, and community leaders who are working to retool their schools for the 21st century. Powerful new technologies and the information superhighway create new possibilities for extending the time, the place, and the resources for learning. Schools can be linked to the home, and to libraries, museums, community centers and the work place, to provide high quality learning opportunities at any time and any place. Challenge grant communities will make these connections and open their schools to new educational resources available across the nation and around the world.

As each Challenge Grant community acts on its vision for education reform, careful attention is being paid to ensure that we do not become a society in which low income communities and other areas with the greatest need for technology are left behind in the acquisition of skills and knowledge needed to be productive citizens in the 21st century. These grants support local alliances of educators, industry partners, and community leaders who are committed to developing creative responses to the information age requirements of all learners, including those in inner cities and rural areas.

These 19 Challenge Grant communities are likely to succeed because they have begun with a clear definition of the educational problems they want to address. In most cases these communities are working on the integration of new technologies into state or local education reform efforts that have been stimulated by the National Education Goals. Effective use of new technologies in these communities will contribute to school readiness and improved student achievement in reading, writing, science, mathematics, the arts and other disciplines. Each project will support professional development for teachers and promote greater parent and community involvement in education. And each will help smooth the transition from school to work by engaging students in real life learning experiences through which they can develop the life-long learning skills necessary to compete in the economy of the 21st century. In several cases, district-wide, state-wide, and regional efforts to set clear expectations for what all students should know will enable these communities to form major markets that stimulate demand for new high quality learning systems and software.

Although the funds available this year limit these Challenge Grants to just a handful of the 530 communities that applied, during the 1995-96 school year we plan to conduct a second round competition, which could lead to an additional award of 20 new grants by September 1996.

For additional information on this program contact:

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Phone: 202-708-6001
Fax: 202-708-6003**

San Mateo County Office of Education

Redwood City, California

Silicon Valley Challenge 2000 Multimedia Project

This project is one element of an ambitious program to revitalize education in schools throughout Northern California's Silicon Valley. Under the leadership of the San Mateo and Santa Clara County offices of education, and a consortium of industry partners called "Joint Venture: Silicon Valley" (JVSV), over \$15 million in corporate contributions has been raised in the area to support systemic school reform. The Challenge 2000 Multimedia project builds on the collaborative foundation and experience of JVSV, helps unite several of its diverse elements, and focuses on the use of multimedia technologies in the creation of student instructional units. The project includes 37 schools, more than 750 teachers and 23,000 students drawn from two counties and nine school districts. Over 50% of these students come from low-income homes. The project addresses objectives of the Goals 2000 Act, provides an extensive professional development program, contains a strong school-to-work element, and promotes reform at all levels of education.

The Multimedia Project creates four "school communities," consisting of elementary and secondary schools, and colleges. The program is establishing a high-performance telecommunication network that links the schools, allowing them to exchange curriculum information and participate in joint educational activities. Through the network, the schools have access to state-of-the-art multimedia development tools, and physical and virtual resources at the Bay Area Multimedia Technology Alliance (BAMTA). BAMTA's "Collaboratory" is an educational research facility and technology testbed that facilitates the development of multimedia projects, including collaborative work environments. The school communities are being equipped with multimedia hubs containing high performance computer graphics workstations that allow students and teachers to take full advantage of Collaboratory resources. Each of the schools is developing an "exemplary practice" model for learning activities supported with multimedia software and network tools. Students use these technologies to explore subject matter content, and engage in collaboration, planning, revision, problem solving, critical thinking, and reflection. The school communities have also developed individual technology plans:

Blossom Valley Learning Consortium

Located primarily in South San Jose, this school community includes nine schools, and the general and special education departments of San Jose State University. Support services such as tutoring, alternative learning, and medical diagnoses are provided in partnership with local government, public agencies and industry. A school networking plan and a cross-school assessment system help consolidate the schools' programs. One school district in the consortium is opening a "Technology Teacher Magnet School" where teachers learn to use telecommunication and multimedia to enrich curricula.

Family of Schools

This community of 15 schools drawn from four districts serves an economically and culturally diverse population of over 10,000 students. The team's high school draws 40% of its students from an inner-city area where the median household income is less than half the national average. The Family of Schools focuses on improving math and science instruction, with extensive support from industry partners, including three major businesses, three community colleges, and an educational foundation. This community has established a professional development center where teachers create and test technology-supported math and science curricula.

Overfelt Family

These five East San Jose schools serve one of Silicon Valley's most economically stressed communities. At the elementary schools, eight out of ten children are eligible for free or reduced-price lunches. At

home, nearly 80% of the students speak a language other than English. The Overfelt Family community is focusing on improvements in literacy and language arts, and is turning its schools into family centers, building on the school-linked "Healthy Start" integrated services program. Other focuses are retention, motivation and support of teachers in connecting instructional activities to real-world applications.

Palo Alto Learning Communities

This community of 16 schools focuses on literacy and school-to-work activities in an ambitious reform program that: 1) promotes performance assessment by community and corporate representatives who conduct standardized scoring of student multi-media exhibitions; and 2) helps develop school-to-work skills with a network link between schools, libraries, administrative offices and corporations.

JVSV has obtained commitments for educational support from the Hewlett-Packard Company, Intel, Network General, Symantec, 3Com, Silicon Graphics, Apple Computer, Applied Materials, Cirrus Logic, Logitech, NetManage, Quantum, the Robert Noyce Foundation, Sun Microsystems, Wells Fargo Bank, and Adobe Systems. JVSV is acting as a broker in obtaining technical support from the staff of these corporations for Multimedia Project schools. Additionally, JVSV is providing funding for release time and basic computer and Internet training of teachers. Silicon Graphics, Inc. will donate up to ten high-performance workstations for each school community hub, which will be located in the team's secondary school.

Project evaluation will be performed by SRI International. The project will maintain complete records of activities and products generated by the four school communities, and these materials along with results of the project evaluation will be disseminated in hard copy form and through the World Wide Web. The Multimedia Project brings together a powerful consortium of public, and private institutions to implement a comprehensive plan to help reform education in schools throughout the Silicon Valley.

Consortium Partners

Bay Area Multimedia Technology Alliance
Blossom Valley Learning Consortium
Family of Schools
Institute for Research on Learning
Joint Venture: Silicon Valley--21st Century Education
Initiative & Smart Valley, Inc.
Overfelt Family
Palo Alto Learning Communities
Santa Clara County Office of Education
Smart Valley, Inc.
SRI International

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San Diego Unified School District

San Diego, California

The Triton Project

"The Triton Project" is a multi-partner educational reform effort that blends a unique ocean-themed curriculum with several technologies to create new learning opportunities for students and teachers in the San Diego schools. The San Diego Unified School District is the eighth largest in the country. More than 26% of its students are classified "English language learners" (ELL), and they speak more than 50 native languages. Over half the ELL students are economically disadvantaged, and academic achievement among many students throughout the school system is poor. The Triton Project uses the capabilities and unique appeal of modern technology to capture interest in core curricula, provide a highly productive education program, and produce improved student achievement throughout all elementary and secondary schools in the system. As the program is expanded to include all San Diego School System students by the year 2000, more than 128,000 children will participate. This program includes a strong staff development component and evaluation plan. Its major focus is the development of a content-based and standards-driven curriculum. The program stresses systemic reform, and contains elements that are in compliance with recommendations of the National Education Commission on Time and Learning and the Goals 2000 Act. There are four main goals:

1) Equitable Access to Technology

The program is increasing the availability of educational technologies throughout the school system in order to ensure equitable access to technology-related opportunities for all students. The program teaches students to identify, organize and allocate educational resources. They work with a variety of technologies, including the Internet, word processing, spreadsheets, databases, multimedia, telerobotics, videoconferencing, digital video, and virtual reality.

2) Improved Learning Outcomes

The program utilizes a variety of technologies to improve learning outcomes in reading, writing, math, and science. Several approaches are employed, including the establishment of measurable objectives and evaluation strategies, the implementation of curricula that address the needs of second language learners, and the application of technology to specific learning challenges.

3) Improved Interaction with Parents and the Community

The program promotes effective telecommunication using computers, video and cable television. These technologies encourage communication across ages, geographies, genders, ethnicities, and economic levels. Through telecommunication, digital video production, and cable television, the program allows students to contact and learn from schools and other community resources at distant sites.

4) Effective Staff Development

The program provides effective, hands-on training for administrators, teachers, support staff, and parents. Teachers learn to use technology as a tool in developing lessons, and discover how to locate and utilize educational resources on the Internet.

The Triton Project is a collaborative partnership between the San Diego City Schools and a number of private and public organizations within the community. Each of the partners provides a unique service to the program. The school system is working closely with the Mayor's office to connect electronically all classrooms, offices and school libraries to colleges, universities,

public libraries, medical centers, social service agencies, research facilities, Sea World, museums and other places of interest in the city. Sea World is expanding its telecommunication capabilities directly into district classrooms, and communicates directly with students via the Internet. Scripps Institution of Oceanography and the Stephen Birch Aquarium-Museum are sharing two curricular units they have developed: "Kelp Forest" and "Forecasting the Future." They also work with teachers in the development of new curricula. The San Diego Public Libraries offer Homework Centers as an electronic resource for students. Pacific Bell, through its Education First project, links the partners electronically, and is working with San Diego State University on a curriculum development project. The San Diego Supercomputer Center supports the design and production of a curriculum that takes the vast resources of the Internet and filters them into a practical, useful program of study. It also supports the virtual reality component of the project. The Naval Command Control and Ocean Surveillance Center gives advice in virtual reality development, demonstrates advance technologies in action, works with students to design and develop robots that can operate at a distance and in virtual worlds, and offers engineering and technical support.

An external evaluator from San Diego State University is working with Triton Project staff to design an evaluation plan for the program. The evaluator will conduct site visits, observations and interviews, and will coordinate project data collection. School district staff will work with Triton Project staff to coordinate data collection and analysis. Project participants will assist at every level in the design, implementation and interpretation of the evaluation.

The Triton Project blends new technologies, intriguing subject matter, and non-traditional learning opportunities in a unique and motivational education program.

Consortium Partners

Naval Command Control & Ocean Surveillance Center
Office of the Mayor of San Diego
Pacific Bell's Education First Initiative
San Diego Data Processing Corporation
San Diego Public Library System
San Diego State University
San Diego Supercomputer Center at UC-San Diego
Scripps Institute of Oceanography
Sea World
Stephen Birch Aquarium-Museum

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Capital School District

Dover, Delaware

Delaware Interactive Educational Television Consortium

The Capital School District and the State of Delaware have formed an Interactive Educational Television Consortium that is bringing unique and engaging classroom learning activities directly into the homes of schoolchildren throughout the state. Through the use of small computers ("set-tops") that connect to home televisions equipped with cable or phone modems, the consortium can provide programming that is interactive, entertaining, educational, and tailored to meet both state curriculum requirements and the individual needs of students. This program can be easily replicated in school systems throughout the country. It responds to recommendations of the National Commission on Time and Learning, fits within the framework of the Goals 2000 Act, and has a strong school-home element. The program is being piloted in five elementary schools with high percentages of disadvantaged students. As it grows into the state's 16 school districts, more than 12,500 students in grades K-6 eventually will participate. The program has four major goals:

1) Increase Student Learning Time

In response to the challenge of breaking the mold of our "factory-era schools" this project utilizes cutting-edge technology to extend learning into the home on a daily basis. This allows students to increase their learning time with instructional programs that directly address their learning styles and needs. Time typically spent passively and unproductively watching television and playing video games is replaced with active and productive learning time in which solid curricula are combined with video game interactivity to create a new learning dynamic for children.

2) Increase Parental Involvement

Family and community participation are vital components of this project. No matter how thoughtful and comprehensive a school improvement program is, the school alone cannot improve academic performance for all students. This project fosters and supports a home environment that encourages learning, provides for realistic expectations, and enhances the parent's role as the child's first and most important teacher. It also fosters improved communication between parents and teachers.

3) Provide Professional Development for Teachers and Staff

Teachers and staff receive comprehensive training for the project, and they are provided set-top computers for their homes. As the infrastructure is deployed, teachers participate in interactive staff development "on-demand," and they learn to use the system to generate personalized instructional materials for students. In addition, they can go "on-line" with their colleagues and learn, share and communicate easily with one another.

4) Provide Equitable Access to Educational Technology

Every child involved in the project and every household they represent is provided, free of charge, all equipment needed to participate fully. This program opens opportunities for universal access to high-quality instruction and helps to close the gap between the technology haves and have-nots.

Hardware and initial programming for this project have been developed by The Lightspan Partnership, Inc. of Robbinsville, New Jersey. Lightspan also provides training for faculty and parents, and ten days of consultant support for each school. Additional programming in language arts, health, social studies, science, math,

parenting and other subjects is provided through contracts with a wide variety of educational publishers.

The Interactive Educational Television Consortium is an outgrowth of the Delaware Educational Technology Committee, the Delaware Goals 2000 Technology Committee, and the Capital School District Technology Committee. State partners in the consortium include the Delaware Department of Public Instruction and all school districts in Delaware with elementary student populations. Programming partners include the Lightspan Partnership, Cable in the Classroom, WHYY Public Broadcasting in Wilmington, Tom Synder Productions, the Agency for Instructional Technology, Seymour Pappert's Creative Playground, the Imagination Machine, and others. Hardware and technical support partners include Comcast Inc., TeleCommunications Incorporated (TCI), the Cable Television Association of Maryland, Delaware, and the District of Columbia, Apple Computer, and others.

In addition to the interactive telecommunications network, each elementary classroom involved in the project is being equipped with new technologies to support the education process at school. Participating classes contain three set-top computers, one teacher workstation with a large-screen monitor for instructional presentations and lesson modeling, and two set-tops serving as student workstations. Student workstations are equipped with headsets, so that students can participate in personal multi-media instruction without disturbing classmates.

Dover's Capital School District and the State of Delaware have forged a dynamic alliance of private industries, government agencies and educational institutions to extend the education process beyond the walls of the traditional classroom and place it in the hands of parents and their children.

Consortium Partners

- Apple Computer, Inc.
- Bell Atlantic
- Cable in the Classroom
- Cable Television Association of MD, DE, & DC
- COMCAST
- Delaware Department of Public Instruction
- Delaware Schools with K-6 students
- The Lightspan Partnership
- State of Delaware
- Tele-Communications Inc. (TCI)
- WHYY Public Broadcasting, Wilmington

Project Director: Dr. William McGlumphy
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Waukegan Community Unit School District 60

Waukegan, Illinois

Technology and Learning Collaborative

The Technology and Learning Collaborative (TLC) is a dynamic consortium of educational institutions, private businesses, and government agencies that has developed a multi-faceted program to modernize and improve the educational process in the Waukegan Public Schools. Waukegan schools experience many of the problems common to inner city systems: high truancy rates, widespread poverty, high mobility rates, and low academic achievement. The TLC consortium is addressing these problems by implementing a community-wide math and science education program based on innovative uses of new technologies. This is a replicable program that has strong school-home, school-community and school-work components. It provides for extensive professional development training, and addresses targets of the Goals 2000 Act. More than 7,000 students in grades 4-12 receive direct benefits from the program. Project goals are:

1) Improving Student Achievement in Math and Science

With the use of new technologies and an emphasis on project-based learning activities, students improve their achievement through:

- 1) Active engagement in constructing and communicating principles of math and science;
- 2) Participation in meaningful scientific investigations;
- 3) Investigation and understanding of basic math and science concepts;
- 4) Investigating and understanding connections between subject disciplines; and
- 5) Relating scientific and mathematical knowledge to themselves and their lives by working on real-life problems and issues.

2) Promoting Engaged Learning

Making the transition to "engaged learning" (learning while doing and learning from doing) requires rethinking the way traditional material is taught. To accomplish this, teachers in Waukegan schools practice peer coaching through classroom visits and conferencing with lead teachers. Lead teachers develop project-based, collaborative learning units that integrate math, science and technology. They receive training in engaged learning methods from Apple Computers, Inc., the North Central Regional Education Laboratory (NCREL), and other consortium partners, and they learn how to utilize technology to facilitate engaged learning.

3) Promoting the Use of Educational Technologies

The consortium is establishing model classrooms to be duplicated throughout the Waukegan schools. Each classroom contains a teacher workstation with multimedia capability; an overhead TV monitor; five student workstations with multimedia capabilities; a laptop; a printer; a compact video camera; a color scanner; a digital camera; and an Internet connection. The project provides teachers and students training in the use of these technologies.

4) Improving Workplace Readiness and Workplace Skills

In a program to reach beyond the walls of the classroom, the Technology and Learning Collaborative is establishing Technology Learning Community Centers (TLCC's) that provide students, parents and other adults access to a wide range of educational technologies and information. The TLCC's are located at four easily accessible sites within the community, and they offer computers, printers, connectivity to the Internet and other resources for public use. In addition, the Waukegan Public Library is developing and maintaining an on-line community bulletin board that provides assistance to individuals seeking information on education, community services and job opportunities.

This project is producing several products and processes that are being disseminated to school systems throughout the country. Examples include project-based, collaborative learning units for math and science, classroom case studies in video, print and

electronic forms, a professional networking model; and a model Technology Learning Community Center (TLCC) for lifelong learning. These products are distributed nationally and globally with the assistance of Apple Computer, Northwestern University, the North Central Regional Education Laboratory (NCREL), and the Illinois State Board of Education (ISBE).

The TLC is receiving substantial support from businesses and government agencies in the Waukegan community. Abbott Laboratories is helping to produce workplace readiness videos. The College of Lake County, the Waukegan Park District, and the YMCA are providing space, staff and programming for three Technology and Learning Community Centers. Barat College is providing faculty and student mentors for science projects. The ISBE is developing guides for use by other school systems. Legat Architects and U.S. Cable are donating program planning services for infrastructure design. North Central Regional Education Lab is conducting a series of training workshops for teachers. The Northeastern Illinois Assistive Technology Consortium and the Special Education Parents Advisory Council (SEPAC) are offering extensive support for children with disabilities. Northwestern University is using Waukegan as a test site for its Collaborative Learning through Visualization (CoVis) project in earth science, and the Waukegan Schools Foundation is providing educational technology equipment.

Consortium Partners

Abbott Laboratories
Apple Computer, Inc.
Barat College
College of Lake County
Illinois State Board of Education (ISBE)
Lake County Technology Campus
Legat Architects
North Central Regional Education Laboratory
Northeastern Illinois Assistive Technology Consortium
Northwestern University
Special Education Parents Advisory Council
U.S. Cable of Lake County
Waukegan Park District
Waukegan Public Library
Waukegan Schools Foundation
YMCA

Project Director: Elaine Armani

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Anderson Community School Corporation

Anderson, Indiana

Anderson Community Technology Project

Anderson Community Technology Now! is a consortium of local and state agencies in Indiana that is combining innovative technology initiatives to raise the academic achievement of 3,140 underchallenged and at-risk students (and their families) in six elementary and two middle schools. The program is designed to accelerate the pace of educational improvement and ensure greater economic opportunity within the community.

The project is addressing its goal by--

- increasing community involvement in public education;
- increasing teacher professionalism and productivity through professional development activities;
- developing new learning environments;
- strengthening the connections between home, school, and community to foster family skills and involvement in education; and
- providing opportunities for teachers and students to become self-directed and collaborative learners.

As part of previous school and systemic restructuring efforts, Anderson has undertaken several activities which will be used in this project. One such activity is the School on Wheels, a specially trained cadre of teachers and principals who can temporarily assume the roles of entire school faculties to enable educators to participate in staff development. Another activity is the 1995 Community Forum for Education, supported by local employers, community organizations, and civic groups. This organization studies, plans and helps implement new educational applications of technology.

The Anderson Community Technology Project has several major components:

- 1) The Buddy System Project at the Corporation for Educational Technology (CET) promotes the extension of the learning day beyond the classroom and into the homes of 4th-8th grade students.
- 2) The Vision Athena Project, sponsored by the Corporation for Educational Communications (CEC) and the Children's Museum of Indianapolis, is making available two-way video for distance learning and electronic field trips, e.g. to the Indianapolis Zoo. Butler and Indiana Universities, the school system, and the Anderson Federation of Teachers are providing instructional courses and staff development in the use of educational technology.
- 3) A community technology center with Internet connections and regularly held training sessions is being dedicated at the Anderson Public Library to benefit all community members.
- 4) Professional development services are being provided by the Indiana University School of Education and the Butler University College of Education. The focus is on integrating technology into the history, language arts, mathematics, and science curricula.
- 5) On-line and in-person tutoring in literacy, mathematics, and technology is being provided by Anderson University students (60 in the first year) to elementary and middle school students.
- 6) Educational videotapes developed by Indiana Public Broadcasting Stations in collaboration with Anderson teachers are supplementing 4th grade Indiana history materials.
- 7) Special educational programming and teacher training are being broadcast through the local TCI cable operator to students and their families. Programs include "Ingenious" (news, weather, etc.)

and "What on Earth" (6 news stories per day). This is one of the first multimedia databases for homes delivered by cable.

8) Family mathematics and science training is delivered via two-way video by the Children's Museum of Indianapolis to school and community facilities to strengthen family learning in mathematics and science.

About 240 fourth grade students are the focus of first-year activities, and the project will expand to all upper elementary and middle school students and their teachers by the end of the five-year project. First-year activities include computer instruction in word processing and productivity software, and integration of technology applications into 4th grade language arts and social studies classes. Emphasis is on changing teaching styles, using the home computer for collaborative writing and reading projects, and using telecommunications projects to teach Indiana history. Each school has a fund to allow teachers to purchase professional development services from the three participating universities. Other professional development activities include the School on Wheels and the Principals Technology Leadership Training Program sponsored by the Indiana Department of Education. Rockman *et al*, a research and evaluation group in San Francisco, is conducting an evaluation of the entire program. The evaluation will determine changes in: academic achievement of disadvantaged students, family involvement in the education process, computer-based instructional time, and changes in teacher attitudes and instructional approach.

Consortium Partners

Anderson Area Chamber of Commerce
Anderson Federation of Teachers
Anderson Public Library
Anderson University
Butler University College of Education
Children's Museum of Indianapolis
Corporation for Educational Communications (CEC)
Corporation for Educational Technology (CET)
Indiana Department of Education
Indiana Public Broadcasting Stations
Indiana University School of Education
National City Bank
TCI of Central Indiana (cable TV)

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Indianapolis Public Schools

Indianapolis, Indiana

A Learning Cooperative

The Indianapolis Public Schools are pioneering a unique school/government/business consortium called "A Learning Cooperative: Connecting and Supporting Systemic Mathematics, Science and Technology Initiatives via Telecommunication." Utilizing the experience and resources of Ameritech, a cellular service provider, this consortium is developing an affordable, scalable, and equitably distributed telecommunication infrastructure which links the North Central Regional Educational Laboratory (NCREL), 25 schools in Indianapolis, 25 in Chicago, and 3 in Walled Lake, Michigan. The new network delivers research-based curriculum and technical support to participating schools, and it provides professional development activities for the program's teachers. The program promotes systemic change in the teaching of mathematics, science, and technology, is in accord with the recommendations of the Goals 2000 Act, and has strong school-home, school-community and school-work elements. About 90,000 students receive direct benefit from the project. There are six major components of the program:

1) Developing and Sharing Exemplary Instruction

The network allows exemplary teachers to conduct lessons at participating consortium schools via "distance learning." Lessons are prepared in the form of "Curriculum Support Units" (CSU's), short video programs with supplementary text that teach specific key concepts. Through careful collaboration among the consortium members, the CSU's are designed to address basic math and science concepts, and to fit smoothly within the curriculum frameworks of each district.

2) Providing Professional Development

The Learning Cooperative provides unique professional development opportunities for individual teachers, principals, administrators and school community teams. During regularly scheduled on-line meetings, educators analyze and improve their curriculum, instruction and assessment practices in math and science. The system provides access to a database of professional development materials produced by NCREL, and it is connected via the Internet to other professional development resources.

3) Providing Technical Assistance and Educational Support

The Learning Cooperative and Ameritech have established a group of advisors that provide technical support related to the program's infrastructure and educational content. The advisors help participating teachers identify effective methods for putting Learning Cooperative activities in place, suggest ways to share ideas for using the system, and promote the use of technology in math and science instruction.

4) Improving Communications Between Parents and Schools

The Learning Cooperative is building awareness of the need for increased parental involvement in the educational program, and it is working to improve the connection between parents and school staff. The consortium's telecommunication infrastructure is being used to provide information to parents on specific ways they can take an active role in school activities, to convene parent support groups, to establish a hotline for homework information, to provide a voice mail service for teachers, and to produce educational television broadcasts.

5) Conducting evaluation

The Learning Cooperative is conducting an ongoing evaluation for the purpose of: 1) determining its progress in achieving goals; 2) improving the curriculum; 3) identifying barriers to a successful program; and 4) identifying the next steps in improving the program. Evaluation activities have been designed to help consortium partners measure their own progress in improving math and science curricula and understand the theories behind best practice methods in math and science teaching.

6) Developing partnerships to provide ongoing resources.

The Learning Cooperative has established an educational communications system for use by school personnel, parents, and community members. The system contains information on the effective uses of technology in learning and teaching, and it allows teachers, parents, community members and other interested individuals to make contacts, learn and work together, or just talk to one another. The system is connected to numerous other Internet resources related to critical education reform issues.

Each partner in the consortium has a unique role. Ameritech is installing and maintaining the equipment. The Indianapolis Public Schools are leading the development of science units and staff development. The Chicago Public Schools are developing mathematics activities and staff development activities. The Walled Lake Community Schools are developing a method to integrate the science and math units into the curriculum of the three districts. NCREL is developing communities of practice and curriculum support units, as well as scheduling distance learning through the telecommunication infrastructure.

The "Learning Cooperative" has developed a comprehensive program that utilizes educational technologies to revitalize the education process in participating schools, involve parents in school reform, and promote cooperation between disparate school systems in three midwestern states.

Consortium Partners

Ameritech (Indianapolis, IN)
Chicago Public Schools
Detroit High School of Commerce & Business
Administration
Indianapolis Public Schools
LearningAccess (Washington, DC)
North Central Regional Educational Laboratory
(NCREL) (Oak Brook, IL)
Walled Lake Consolidated Schools (Walled Lake, MI)

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Natchitoches Parish School Board

Natchitoches, Louisiana

The Natchitoches Parish School Board and Goals 2000/LaNIE

The Natchitoches Parish School Board and Goals 2000/LaNIE Technology Challenge Grant Consortium is developing comprehensive programs that use telecommunication to increase participation in high-tech learning by underserved K-12 students in five Louisiana school districts. The consortium will ultimately increase communication among all community stakeholders by using learning technologies to provide educational opportunities for students and parents at more convenient times and more accessible places. Over five years, approximately 174,000 students in 48 schools and 19 community sites will be served by the consortium.

This project builds on a previous Louisiana Goals 2000 effort and a Louisiana Networking Infrastructure for Education (LaNIE) grant received from the National Science Foundation to integrate Internet resources and K-12 instruction at five pilot sites across the state. Staff from both projects have been working jointly to develop an overall state educational technology plan.

Building on the work of the pilot sites, the new project is developing transferable models for providing underserved students access to technology, increasing student achievement, and documenting successful practices for widespread use in other communities across the country. Each of the five pilot sites, guided by a district technology advisory committee, is developing, implementing, and evaluating a comprehensive district plan for using educational technology to increase student achievement and to meet local educational goals.

To improve student achievement, the project will address school readiness and provide professional development activities for educators and community partners; it will also involve parents in the learning process and concentrate on the transition from school to work and life-long learning.

Project staff are giving special attention to: 1) the obstacles limiting access for underserved populations; 2) training for additional school personnel, parents, and community program leaders; and 3) the development of materials to support parent and community programs.

Each district is increasing access to educational opportunities by opening school sites after hours and by expanding access to places more often visited by community members.

The five districts are developing standards-based curriculum materials for all content disciplines, and expanding access locations to include community centers, playgrounds, libraries, and churches. Priority subject areas are mathematics, science, language arts and literacy. Professional development activities for teachers, students, parents, and administrators of community organizations are being offered. Dissemination plans and public awareness campaigns are also being developed (electronic mail, home page at each site, regional conferences, etc.). During the second and third years additional community sites will be added and teacher-developed curriculum materials will be disseminated on-line through the International Society for Technology in Education Gopher server and World Wide Web server. During the fourth and fifth years video conferences will be used to transfer model practices to other parts of Louisiana. In addition, the project will work with the

Louisiana Board of Elementary and Secondary Education and the Board of Regents to develop technology standards for pre-service and in-service education.

Professional development courses for educators and community members are being developed collaboratively by consortium members, and will be offered at each of the following cooperating universities: Northwestern State University, Natchitoches Parish; Northeast Louisiana University, Ouachita Parish; the University of Southwestern Louisiana, Lafayette Parish; the University of New Orleans, Jefferson Parish; and McNeese State University, Calcasieu Parish.

Consortium Partners

BellSouth Telecommunication
Calcasieu Parish School System
Governor's Office of Women's Services
Governor's Office: Louisiana Goals 2000/LaNIE
Greater New Orleans Free-Net, Inc.
International Society for Technology in Education
Jefferson Elementary School PTA
Jefferson Parish Public School System
Lafayette Natural History Museum
Lafayette Parish School Board
Louisiana Association of Computer Using Educators
Louisiana Bd. of Elementary & Secondary Education
Louisiana Board of Regents
Louisiana Department of Education
Louisiana Department of Public Safety and Corrections
Louisiana Networking Infrastructure for Education
McNeese State University
Monroe City School System
Natchitoches Parish Library
Northeast Louisiana University
Northwestern State University
Our Lady of Lourdes Regional Medical Center
Shell Oil Products Company
University of New Orleans
University of Southwestern Louisiana

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Baltimore City Public Schools

Baltimore, Maryland

Baltimore Learning Communities

The Baltimore Learning Communities project is a multi-faceted education program that utilizes distance learning, interactive cable TV and the Internet to connect schools to homes, places of work, and the community at large. The program provides extensive professional development training for teachers, directly involves parents in the education process, and extends a wide range of new educational opportunities to over 38,000 students at the middle and high school levels. This is a replicable program that addresses recommendations of the Goals 2000 Act, promotes life-long learning, and has strong school-work, school-home, and school-community components. The program has four main elements:

1) School

School-based activities focus on mathematics, social studies, science, communication, and the arts. They complement findings of the Secretary's Commission on Achieving Necessary Skills (SCANS), and emphasize competencies required by the job market. Students learn to plan schedules and budgets, improve interpersonal skills, conduct research, communicate information, locate career data, and use technology to facilitate learning. The Johns Hopkins University Center for Technology in Education and the Institute for Policy Studies, and the University of Maryland at College Park coordinate training in which teachers use new technologies to create customized curriculum products.

2) Work

The Baltimore Learning Communities project connects schools to the workplace through two-way interactive video connections and digital networks. Through this system, work supervisors at retail stores, supermarkets, restaurants, and other places of business interact with school professional staff to learn how to transform work experiences into learning experiences. Participating businesses develop learning-rich tasks that lead to "Service Certificates" for student employees. Supervisors receive guidance from Bell Atlantic instructors adept at the change process, and are supported by Johns Hopkins University staff knowledgeable about adolescents and the transition from school to work. In addition, "Magic Me," an AmeriCorp national service and learning organization, is recruiting and training parents to participate in this element of the program.

3) Connections

The Baltimore Learning Communities project utilizes Internet connections to provide school and career information. Students query existing labor market databases to explore opportunities and salary structures in a wide range of occupations; teachers use electronic resources in planning and building curriculum products; and parents provide assistance at schools and community centers where interactive video and computers are available. This element of the Baltimore Learning Communities project contains job opportunity benefits for both students and their parents.

4) Digital Video on Demand

Discovery Communications, Inc. (The Discovery Channel and The Learning Channel) is providing about 100 hours of educational video material for use in the project. This information, which is specially selected and indexed, includes professionally produced documentaries and other programming with valuable instructional content. It also contains professional development material created for programs such as "Teacher TV," which has aired on the Learning Channel. DCI is digitizing this programming to permit on-demand retrieval and high quality display via the Internet. All content is indexed to state and local learning goals, and can be located by keywords and phrases. Teachers may select segments of

video material to meet specific instructional needs. Materials from other sources, such as the National Archives, are also available.

Partners in the Baltimore Learning Communities project contribute to the program's success in a variety of ways: Apple Computers and Bell Labs are providing significant contributions in hardware and resources. Learning Matters, Inc. is producing CD-ROM's in support of the SCANS element. The Maryland Business Roundtable is facilitating the use of two-way video to allow students to "shadow" workers in a variety of occupations. The Maryland Institute College of Art is helping middle school students produce TV programming through Baltimore Youth Television. The American Training Standards Institute, a non-profit organization, is linking school local area networks with a wide area network. The Educational Film Center is providing interactive multimedia, software, videodisks and video/print curriculum series. The Pelavin Division of the American Institutes for Research will perform ongoing evaluations, covering all four major elements of the project. Results of the evaluations and educational materials developed for the project will be disseminated through the Internet, professional publications, and documentary television.

Consortium Partners

AIR/Pelavin Associates, Inc.
American Federation of Teachers
American School Counselors Association
American Training Standards Institute
Apple Computers, Inc.
Bell Atlantic
Citizens Information Technology Education Center
COMCAST, Inc.
Discovery Communications, Inc.
Educational Film Center
Johns Hopkins University
Learning Matters, Inc.
Magic Me
Maryland Business Roundtable
Maryland Institute College of Art
Maryland Public Television
Maryland State Department of Education
Maryland State Teachers Association (NEA)
National Archives
NEA Center for Innovation in Education
Restaurant Association of Maryland
Space Telescope Science Institute
University of Maryland at College Park

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Newaygo County Intermediate School District

White Cloud, Michigan

Newaygo County Advanced Technology Service

The Newaygo County Advanced Technology Service (NCATS) consortium has been established to develop and maintain an advanced fiber optic cable telecommunication network that will enrich the education process throughout the county. The network's education program enhances educational opportunities for over 9,000 disadvantaged students and adults; improves the training and mutual support of the teaching staff in county schools; provides a delivery mechanism for improved curricula; and supports a unified effort among all county service agencies to coordinate their actions in dealing with the social, educational, and economic needs of local families. The network supports data, video, and voice communications capabilities that are available to all county residents. It connects all the county schools, the county seat, the hospital, libraries, private non-profit agencies, and area businesses. It provides student access to higher level curriculum in science, mathematics, and modern languages, and it supports professional development opportunities for teachers. NCATS is a replicable program with strong school-home, school-community, and school-work components. The program was specifically designed to help meet student outcomes envisioned in the Goals 2000 Act.

The need for this program is urgent. Newaygo County is one of the most rural, isolated and poor counties in Michigan, and almost half of its students live in poverty. The students of this county consistently score below state averages on the Michigan Educational Assessment Project (MEAP) in the fourth, seventh, and tenth grades. The consortium's program, which reaches over 9,000 students and their teachers, utilizes educational technologies and specialized program content designed specifically to help overcome these problems.

Specific objectives of the program include:

- Providing teachers and students access to network technology
- Increasing student achievement levels to state averages on standardized tests
- Giving parents and community members tools to assess student readiness for work
- Establishing a "single point of intake" system for County service agencies
- Creating a centralized data bank of student assessment tools and lesson plans for teachers
- Providing a county-wide profile of student achievement for use in professional development activities for teachers
- Creating electronic work groups where teachers collaborate to meet student needs
- Creating a delivery system for advanced courses in higher education
- Building an automated management system for teachers
- Establishing county-wide student outcomes in math, language arts, science, and social studies that conform to the Goals 2000 Act and the Michigan Core Curriculum for High School Graduation
- Creating new partnerships within the county that address educational and employment needs of area businesses.

The Fremont Area Foundation, the largest rural-based community foundation in Michigan, provides funding for the construction of the fiber optic network. The Gerber Companies Foundation provides support for the video distance learning component of the network. At appropriate locations throughout the county, the Newaygo County

government provides network access points where members of the public who do not have access to computers can pursue personal interests, check their children's school records, and obtain access to County services.

As the program grows, every teacher in Newaygo County will be provided a personal classroom workstation, and there will be a minimum of four workstations in each class for student use. Each school will be provided two computer lab settings where large class projects can be conducted. Video transmissions of specialized courses and other educational support products will be delivered through a broadband CATV network. The school district is equipping classrooms, a broadcast studio and a video production facility to coordinate video distribution, maintain production archives, and capture educational programming via satellite.

The District has entered into an agreement with Western Michigan University to conduct an evaluation of this project. The evaluation uses a variety of techniques, such as test scores, portfolios, focus groups, and surveys, to collect information pertaining to the effectiveness of the program. Data on qualitative and quantitative measures are collected, and feedback information is made available to project staff and stakeholders about the strengths and limitations of the project. This information is used to ensure that revisions and improvements are made in programs and processes.

This project brings together a strong consortium of public, private, and nonprofit institutions to implement a comprehensive plan to improve the education process in a rural school district.

Consortium Partners

Fremont Public Library
Fremont Public Schools
Gerber Memorial Hospital
Grant Public Schools
Hesperia Public Schools
Newaygo County
Newaygo County Multi-Agency Consortium
Newaygo Public Schools
White Cloud Public Library
White Cloud Public Schools

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Westside Community Schools

Omaha, Nebraska

The Community Discovered

"The Community Discovered: Integrating Art and Technology in K-12 Education" is a multi-element education program that uses technology to bring art museums and other educational resources to K-12 classrooms in Nebraska and 10 other states. The program targets over 40,000 students in rural and urban settings. Its main goal is to strengthen a nationwide community of educators engaged in creating integrated art-focused curricula in all core subject areas. The program contains a strong professional development component, fits within the framework of the Goals 2000 Act, and offers a broad range of extended learning opportunities. There are five major components:

1) The Electronic Art Museum in the Classroom

The Smithsonian Institution, the Getty Museum, the Joslyn Museum, the Sheldon Museum and the Museum of Nebraska Art are making more than 750 art images available to schools through the Internet, along with curriculum and contextual information for use by educators and students. Museum educators are providing educational outreach programs that use technologies such as the Internet, kiosks, and interactive multi-media.

2) Computer-Based Educational Strategies

In collaboration with private companies, educators of disadvantaged and underrepresented students are evaluating educational software for applicability to classroom settings and instructional objectives. In addition, a technology mentor cadre of 13 educators is producing a comprehensive Internet guide to arts and technology resources available in print and through ARTnet, an electronic communications network managed by the Nebraska Department of Education and Prairie Visions: The Nebraska Consortium for Discipline-Based Art Education. These mentors conduct workshops to promote project activities, provide technical assistance via the Internet or telephone, and provide guidance in the selection of computer hardware and software.

3) Professional Development and Support for Educators

Through this program, educators of rural and urban disadvantaged students participate in two-week museum-based institutes to enable them to design curricula that use technology to integrate art and other core subjects. Students use electronic portfolios to record progress, and evaluators review the portfolios to provide guidance in improving art curricula. Participants access curriculum modules, digitized images and other museum resources through ARTnet. Through these activities, teachers gain valuable experience in reviewing, analyzing and integrating resources via the Internet. The program includes a comprehensive mentoring system, in which each teacher is assigned a technology mentor to assist with hardware, software and networking, and a curriculum integration mentor to assist with curriculum development and implementation.

4) Curriculum, Instruction and Assessment Strategies

A minimum of 632 curriculum modules are being developed and implemented, with a target of 90% teacher participation. The modules incorporate Internet digitized images and museum resources, multi-media projects, electronic portfolios, and other computer applications. Target student goals include improved attendance rates, improved student attitudes, and higher student performance. Students from up to 100 Nebraska districts will experience art modules developed through project activities.

5) Nationwide Community for art and Technology Integration

The program is stimulating cross-state partnerships with the goal of replicating project activities throughout the country. The project is

supporting four learning communities of educators and students. Each community is engaged in educational activities which integrate the arts and technology with other core subjects to enable students to achieve high academic standards. The communities are: 1) Nine Nebraska school districts serving isolated and disadvantaged students; 2) The nearly 100 school districts, nine colleges and universities, and four museums and art centers that comprise Prairie Visions; 3) Teams of arts education leaders in Colorado, Utah, Wyoming, Montana and Kansas; and 4) Regional institute grantees sponsored by The Getty Center for Education in the Arts at universities in California, Florida, Texas, Ohio, and Tennessee. A comprehensive evaluation of the entire project has been arranged through the Far West Laboratory in San Francisco.

The Westside Community School District has organized an effective consortium of museums, educational institutions and private industries that is using modern technology to bring some of the world's finest art into classrooms throughout the country.

Consortium Partners

ArtsEdge Arts and Education Information Network
Apple Computer, Inc.
Digital Visions, Inc.
Far West Laboratory for Educational R&D
Getty Center for Education in the Arts (and Grantees)
J. Paul Getty Museum
Joslyn Art Museum
Lexington Public Schools
M Power Multimedia Design Corporation
Museum of Nebraska Art
Nebraska Art Teachers Association
Nebraska Department of Education
Nebraska Educational Service Units #3, #7, & #13
Nebraska Indian Community College
Pacific Imaging Center
Prairie Visions: The Nebraska Consortium for
Discipline-Based Art Education
School District of Grand Island
Sheldon Memorial Art Gallery & Sculpture Garden
Smithsonian National Museum of American Art
The Kennedy Center
Winnebago Public Schools

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Manchester School District

Manchester, New Hampshire

The Manchester Challenge

The Manchester Challenge is a large-scale education reform effort that is integrating instructional technologies into the curricula of elementary, middle, and high schools in the greater Manchester, New Hampshire area. The project is being implemented in collaboration with the Manchester municipal government, nearby school districts, colleges, businesses, industries and technology vendors. Project technologies include instructional television, satellite broadcasts, multimedia telecomputing, and administrative applications. The program addresses recommendations of the Goals 2000 Act, and has strong school-community and school-work components. Over 28,000 students benefit from project activities.

The program is designed to provide all students equitable access to information technology, facilities and training. All participating educators are provided the equipment, training, time and on-going support to enable them to use information technology effectively. All schools throughout the district are being interconnected with a state-of-the-art network for voice, video, and data. Educators and students enhance the learning process with two-way video and audio distance learning classrooms, workstations in all classrooms, instructional television via cable, video production/reception via building institutional loops connected to media centers, multimedia workstations, high speed telecomputing, and a variety of other learning technologies. There are four major program elements:

1) Professional Development

The first year of professional development activities is directed at the high school level, and the remaining years are directed at both middle and elementary school levels. The program offers teachers a series of sequential professional development programs leading to the successful operation of multi-media workstations for classroom instruction. Teachers form learning teams in which more proficient teachers provide instruction and support for the less experienced. Training activities include instruction in the use of the Internet, the World Wide Web, and other technologies.

2) Curriculum Development

University faculty and education consultants assist Manchester teachers with curriculum development. Teams of teachers work independently to carry out curriculum development needed for interdisciplinary, thematic student projects. Teams are developed around common planning time and common student course enrollments. Curriculum units and projects are shared among teacher teams in all participating schools.

3) Technology Implementation

Utilizing the Manchester Challenge telecommunication network, students at all project schools may participate in distance learning classes that would not otherwise be offered due to low enrollment. Each distance learning classroom is equipped with multiple cameras, video displays, and a teacher control station. These classes are augmented by data networks through which faculty and students can share text materials and access relevant databases.

4) Partnership Activities

Consortium members contribute to the Manchester Challenge in a number of ways. The Manchester School District and the municipal government have made a strong commitment to the purchase of new hardware and software. All the other project partners contribute funding and/or in-kind services.

Goals of the project include better teaching, increased learning, organizational efficiency, enhanced communications, improved accountability, and reporting, improved community development, support for life-long learning, access to learning programs by citizens, sustained partnerships between educational and business

organizations, the exchange of information with other educational organizations, shared resources with business and public institutions, and an improved economic viability for the community.

Consortium Partners

Audubon Society of New Hampshire
Bedford School District
Cabletron
Central Paper Products
CHAMPS-Parent Group
Coca Cola
Community Improvement Program
Computer Learning Center
Continental Cablevision
Cyber-Space
Goffstown School District
Gossler Park Parent Teacher Group
Granite State Credit Union
Hallsville Parent Teacher Group
Lavalley/Brensinger Professional Associates
Manchester Chamber of Commerce
Manchester School of Technology
McLane, Graf, Raulerson & Middleton
Memorial High Booster Club
Morgan Press
Multimedia Systems Inc.
New Hampshire College
New Hampshire Department of Education
New Hampshire Public Television
Northwest Parent Teacher Group
Notre Dame College
NYNEX
Optima Health, Inc.
Parkey-Varney Parent Teacher Group
Public Service of New Hampshire
Queen City Sound
State Department of Education
Tech PC
Telephone Network Technologies
Town of Bedford
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Pueblo of Laguna Department of Education

Laguna, New Mexico

Four Directions

"Four Directions" is an education reform project that blends American Indian culture with new educational technologies to revitalize curricula and instruction in Bureau of Indian Affairs (BIA) schools. Based on their urgent need, eight schools representing tribal groups in eight states have been selected as pilot sites for the project. Within five years the program will expand to include 24 BIA schools in locations throughout the country. The project involves K-12 students, parents, and members of their communities. The program has strong School-Home and School-Community components, promotes extended time for learning, and provides extensive professional development opportunities for teachers. Project activities include:

- Restructuring curricula to incorporate local cultures and values
- Collaborating across sites through on-site training, on-line tutoring, and cooperative teaming
- Creating networked "virtual communities" with Internet presence
- Encouraging life-long learning by extending technology support to communities surrounding project schools
- Maintaining a network database of teaching, assessment, professional development, and student-created resources
- Creating a research-based evaluation model

As the core of this project, each school develops an advisory team consisting of students, parents, teachers, paraprofessionals and community members. It is the responsibility of each team to develop authentic learning tasks that are relevant to students and that are drawn from the unique cultural context of each tribe. These tasks are then developed into "thematic cycles," central components of core curricula that allow the presentation of subject matter within a cultural context, and allow the cultural theme to be integrated into other subjects. As members of the team, parents and community members, including elders, are involved in the development of curricula and are involved in the evaluation of the project and its relevance to the traditions of the tribe. Targeted curriculum areas include art, mathematics, science, social studies, economics, geography, language arts and fine arts.

An integral part of this program are communications services provided through the Educational Native American Network (ENAN), an Internet communications service for all BIA schools. Each school is utilizing ENAN to produce World Wide Web (WWW) home pages that describe the school, its history and current activities. Technical support for the WWW effort is provided by the University of Kansas through the Unified Network InformaTics for Education (UNITE) system. The WWW pages also contain information about each American Indian group participating in the project. This information is shared with other schools and with non-Native American schools via the Internet. The WWW pages offer a look at the unique aspects of each American Indian group from the perspective of its own people. This provides students with a focal point for problem solving and for sharing the important cultural contributions made by each of the tribes. The project uses the WWW to disseminate project tasks, curriculum ideas, school information, tribal histories, and project results. Project technologies are used by students to perform research on thematic issues, develop learning activities on the themes, explore other disciplines that are part of the theme cycles, and provide access to their results for authentic assessment. Information and programs developed through Four Directions are available to a wide audience

through the Internet. Access to project technologies is available after school hours to students and their families, in a program to extend learning opportunities to the entire community.

This project contains a strong professional development component. Teams from each of the schools attend a 10 day training session held at the Southwest Indian Polytechnical Institute in Albuquerque, New Mexico. This training covers the development of thematic units based on authentic tasks, the integration of these units into the curriculum, and the use of technology. In addition, the project sponsors two technology training workshops annually at each of the schools.

Best practices reports, as determined by ongoing evaluation of the project, are made available through national conferences, the Educational Resources Information Center (ERIC), the National Clearinghouse for Bilingual Education (NCBE), the Eisenhower National Clearinghouse, and the World Wide Web.

The Four Directions project is a unique program that uses modern technologies to create enriched, integrated learning environments designed around Indian children's real life experiences.

Consortium Partners

Ahfachkee Day School, Clewson, FL
Dilcon Boarding School, Winslow, AZ
Fond du Lac Ojibwe School, Cloquet, MN
Hannahville Indian School, Wilson, MI
Heard Museum of Native Culture & Art, Phoenix, AZ
Indian Island School, Old Town, ME
Intel Corporation
Laguna Elementary/Middle School, Laguna, NM
Mathematical Association of America
Microsoft Corporation
Museum of Northern Arizona, Flagstaff, AZ
Quileute Tribal School, LaPush, WA
Sandia National Laboratories, U.S. Dept. of Energy
Southwest Indian Polytechnic Institute,
Albuquerque, NM
Takini School, Howes, SD
University of Kansas, Lawrence, KS

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Summit County Educational Service Center

Cuyahoga Falls, Ohio

NEW³: New Technology, New Knowledge, New Work

NEW³ is a broad consortium of educational institutions, government agencies, private businesses and philanthropic organizations dedicated to the goal of transforming teaching and learning in Summit County, Ohio by the year 2000. To meet this ambitious objective, the consortium has developed a program through which students use technology to complete substantive *new work* that meets high educational standards set forth by new local curricula, and the Ohio K-12 Competency Based Education standards. Utilizing the talents of business and community representatives, the project promotes life-long learning, through the use of technology, fits within the framework of Goals 2000 objectives, supports school to work principles, and has a strong professional development component. More than 88,000 students benefit from the program.

The NEW³ project addresses the needs of approximately 88,500 students in 18 school districts in and around Akron, Ohio. Six of the school districts have high percentages of economically and educationally disadvantaged students. The project centers on transforming the tasks used in learning and will include all grades, K through 12. NEW³ requires the collaborative efforts of the entire community, including educators, parents, and students.

A critical premise of the program is that school work needs to be redesigned so that it engages students in learning that they view as relevant to their world today and tomorrow. The Challenge Grant enables the Summit County Educational Services Center consortium to develop and implement a plan to design *new work*, to support a Technology Academy for teacher development, and to develop and implement a Technology Work Experience Program for high school and college students.

The first and primary goal of the program is to design *new work* for students – work that engages, work with which children persist, and work that results in a sense of accomplishment. Learners develop competencies by engaging in authentic, meaningful and rewarding experiences that are valued by parents, community, and society at large. *New student work* is being designed and developed jointly with learners, communities, and the Center for Leadership in School Reform of Louisville, Kentucky.

The second goal is to expand teachers' understanding of how to create *new work* in partnership with students through coursework at the Summit County Office of Education's nationally acclaimed "Technology Academy." Here teachers learn about using technologies in the context of what children do, not what machines do. More than 2300 teachers will graduate from the Academy's intensive one year, 73 hour course of study in the five years of the NEW³ project.

The third goal is to design, develop, and operate a Technology Work Experience program through which high school and college students participate in educational and work experiences while maintaining and operating the classroom technologies supporting the NEW³ project. This program enhances school-to-work transitions by providing authentic technology-related experiences for participants. NEW³ has arranged for a major upgrading of school and classroom technology infrastructure. Improvements include computer network installation, electrical upgrades, new computer workstations, and acquisition of video equipment. The Work Experience Program is formed as a nonprofit company, operated by students, and dedicated to rapid response support for

this classroom technology. Funding for the classroom hardware is provided largely by the Ohio SchoolNet program.

The fourth goal is to develop educational software to support *new work*. Partnership with LOGAL of Cambridge, Massachusetts on the development of simulation-based, *new work* software is an important component of the NEW³ project.

A final goal is to provide teachers the opportunity to acquire the skills and knowledge needed to instruct students. Professional development activities are supported by the University of Akron, Kent State University and Ashland University. This includes developing performance standards relating to *new work* and technology. These standards are to be used in considering the employment of new teachers.

In addition, national panels of experts in mathematics, technology, language arts, science and other content areas are involved in assessing curricula and effectiveness. Ameritech, a cellular telephone service provider, is funding and operating two community-based computer centers in the City of Akron in support of NEW³.

By the year 2000, students will use technology to complete substantive *new work* that meets high standards; resulting in transformed schools, and, ultimately, self-sustaining communities of life-long learning.

Consortium Partners

Akron Regional Development Board
Ameritech Ohio
Ashland University
Center for Leadership in School Reform
Eighteen School Districts (Akron Area)
Galen A. Roush Foundation
Kent State University
LOGAL
Summit County Educational Service Center
Summit Education Partnership Foundation
University of Akron

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School District of Philadelphia

Philadelphia, Pennsylvania

Philadelphia's Technology Challenge Consortium

Philadelphia's Technology Challenge Grant Consortium has developed a comprehensive program to invigorate K-12 and adult education programs through the imaginative use of educational technologies. Incorporated within the Philadelphia School District's systemic reform effort, "Children Achieving," the program utilizes many of the latest developments in telecommunication, multimedia, and computer instruction to build new teaching and learning processes within small learning communities. The resulting "Virtual Schools" represent a fundamental and radical transformation of teaching to emphasize interaction and inquiry in the learning process. Over 55,000 students will benefit from the program in the first two years, and in the following three years the program will be expanded to include more than 210,000. The program encourages the development of infrastructure and partnership among the municipal government, the local school district, community service providers, and educational institutions at all levels. This is a replicable program with strong school-home, school-community, and school-work components. It provides effective support for professional development activities, addresses targets of the Goals 2000 act, and offers unique opportunities for extended learning. There are four primary goals:

1) Infrastructure/Networking (Universal Access)

This initiative builds an electronic communications system to connect students, parents, teachers and community members. The system enables citizens to enjoy easy access to the administrative and instructional staff of the School District of Philadelphia, and other local, national and global on-line information resources. The system may be accessed at three key school locations: library areas for parent and student access; teacher areas for faculty and support staff access; and office areas for administrative access.

2) Access to Information

There are two major components of the program's on-line resources: The Teaching and Learning Network (TLN) and the Family Resource Network (FRN). The TLN is a key link to an "effective practices" database which includes information on local and national curriculum resources, sample lesson plans, information on standards and assessment, discussion group opportunities related to teaching and learning issues, cross-referenced lists of all teaching and learning resources on the Internet, and on-line homework assistance. The FRN assists schools in identifying and providing health, mental health and social services to students and families.

3) Professional Development

Each school in Philadelphia employs a Subject Area Specialist in technology (SAS) who is responsible for organizing and supporting education technology efforts in schools, leading the effort to integrate educational technologies throughout the curriculum, and training other teachers at each school in how to use educational technologies effectively. A portion of the funding from this grant will be used to purchase additional professional development services, and to provide professional leave days for teachers to receive training from their school's technology SAS.

4) Virtual Schools

Using the new communications system implemented through this grant, the program distributes curriculum, instruction, and assessment information electronically through on-line centers of instruction called "Virtual Schools." These electronic classrooms offer services to adults seeking diplomas, homebound students, prison inmates, and other hard-to-reach populations. With the cooperation of Consortium partners such as Public Television Station WHYY, the Private Industry Council of Philadelphia, the Community College of Philadelphia, and others, Virtual Schools

offer General Education Degree (GED) coursework, English as a Second Language (ESL) coursework, and other curricula.

The other Consortium partners support "Effective Practice Sites" established within six clusters of high schools and their feeder schools. These sites are demonstration and evaluation laboratories for technology systems and educational strategies developed as part of the project. At one high school, the University of Pennsylvania and Bell Atlantic are developing an Internet communications system to support voice mail, E-mail, professional development, and curriculum development. Temple University is helping students at another school learn how to use the Internet as a resource for English, social studies, and other subjects. IBM is working with three schools to utilize new technologies to assist special education students and students for whom English is a second language. Public Television Station WHYY is lending another school its expertise in production, communication and technology to create a "virtual school." Drexel University students are assisting schools in the integration of new technologies across the curriculum, and emphasizing improvements in math education through the use of computer labs. Moore College of Art is enabling students to develop a wide variety of curricula on CD-ROM, utilizing student-edited video, still images, recorded sound and text. Materials can be distributed via a city-wide network that can support small electronic learning communities.

This project brings together a powerful consortium of public, private and nonprofit institutions to implement a comprehensive plan to improve the education process in an urban school district.

Consortium Partners

Bell Atlantic
City of Philadelphia
Community College of Philadelphia/Private
Industry Council of Philadelphia
Drexel University
IBM
Moore College of Art
Philadelphia Education Fund
School District of Philadelphia
Temple University
Unisys Corporation
University of Pennsylvania
WHYY Public Television

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Towanda Area School District

Towanda, Pennsylvania

New Vision

"New Vision" is a consortium of school districts, post-secondary institutions, museums and private industries that demonstrates the dynamic ability of emerging technologies to expand and improve educational opportunities in rural, remote, poor school districts. Under the leadership of the Towanda Area School District, New Vision is establishing "distance learning centers" at 23 local education agencies (LEA), six post-secondary institutions, and the State Museum of Pennsylvania. These sites are being linked electronically to a network of 40 schools and agencies committed to sharing local educational resources through interactive videoconferencing. Through its network, New Vision can offer high-level classes that are not commonly offered due to low enrollment; use exemplary teachers to cover hard-to-fill positions in several districts at once; conduct unique student workshops; and offer advanced placement courses. The project is establishing one of the largest interactive networks in the country, involving over 54,000 students in Pennsylvania, New Jersey and New York. Each of the LEA's has demonstrated its commitment to the project by agreeing to match 50% of all equipment costs with local funding. This program addresses recommendations of the Goals 2000 Act, emphasizes school to work training, and contains strong professional development and evaluation elements.

New Vision builds upon the success of the Northern Tier Rural Distance Learning Consortium, a distance learning organization established in 1992. This model program consists of six rural school districts in Northern Pennsylvania, and it is funded by a grant from Commonwealth Telephone Company. (No Technology Learning Challenge funding is being used to support Northern Tier programs.) The basic governing bylaws of the Northern Tier Consortium have been adapted for New Vision to form a network of regional consortia alliances consisting of the Cape May Consortium (New Jersey), the Adirondack Consortium (New York) and the Southeast Consortium (Pennsylvania). These organizations have agreed upon a four-phase implementation plan for New Vision:

1) Establishing Distance Learning Centers

Equipment purchases and inventory controls are centrally managed through the Northern Tier Consortium. All equipment purchased through New Vision is the property of each individual school district. All learning sites are fully equipped with the technology required to support distance learning classes.

2) Linking Schools

In cooperation with College Misericordia and the Northern Tier Consortium, New Vision provides a training program for coordinators at all sites to ensure understanding and proficiency in using the system. Training conferences create opportunities for all schools to define strategies for expanding participation of other districts and to modify the program to meet the needs of schools new to the program.

3) Sharing Resources

Each post-secondary participant provides services, programs and activities that can be shared cost-effectively with LEA's. Service components include adult evening programs, career counseling, academic counseling, dual credit high school courses, electronic field trips, peer tutoring programs, staff development, pre-college and pre-technical education, and curriculum development projects.

4) Linking to State Museums

The Pennsylvania State Museum offers electronic field trips, a teacher-to-historian information exchange program, curriculum development initiatives, and program packages that deal with issues and developments in state history and culture. New Vision is working with New York and New Jersey to develop a tri-state exchange agreement

between museums, historic sites, science centers, and participating school districts

Each of the partners in the New Vision consortium provides a unique contribution to the program. College Misericordia conducts dual-credit college level courses. Penn State (Wilkes-Barre and Harrisburg campuses) offers college courses for adults, professional development, career counseling, and guest lectures. Lackawanna Junior College presents Adult Basic Education programs over the network, and provides network connections to the National Tele-Consortium and the Mid-Atlantic Consortium. Commonwealth Telephone company provides free bridging access and is assisting in linking the full consortium. The Pennsylvania Rural Electric Association is helping to disseminate information on New Vision throughout the country. Mansfield University is promoting post-secondary educational opportunities through the network. Atlantic County Community College (New Jersey) is providing technical/vocational training opportunities via New Vision. The PictureTel Corporation is establishing a videoconferencing system at the State Museum of Pennsylvania, assisting with network optimization, and helping to adapt the network for connection to such resources as historic battlefields, zoos, aquariums, science centers, and performance centers. The Center for Rural Pennsylvania is supporting a staff position to operate a networked cultural awareness program. Also, through the network, the State Museum of Pennsylvania provides links to its exhibits, planetarium, and other comprehensive educational resources.

New Vision is a comprehensive, replicable program that utilizes the technology of telecommunication to expand and improve educational opportunities in isolated school systems in Pennsylvania, New York and New Jersey.

Consortium Partners

Atlantic Community College
Center for Rural Pennsylvania
Claverack Rural Electric
College Misericordia
Commonwealth Telephone Company
Community Education Council
Harrisburg Area Community College
International Paper Company
Lackawanna Junior College
Mansfield University
Northeast Pennsylvania Tech-Prep Consortium
Penn State University (Wilkes-Barre & Harrisburg)
Pennsylvania Rural Electric Association
PictureTel Corporation
State Museum of Pennsylvania
Towanda Area School District
and 28 other school Districts in PA, NJ, and NY

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Black Hills Special Services Cooperative

Sturgis, South Dakota

Technology in Education Challenge for Rural America (TEC-RAM)

South Dakota's "Technology in Education Challenge for Rural America" (TEC-RAM) consortium has organized a state-wide, community-focused education program to advance the effective use of technology in restructuring schools by 1) introducing innovative educational technologies in a statewide redesign of K-12 curricula, instruction and assessment; and 2) capitalizing on new technologies to promote student achievement. The program will impact over 14,000 rural students in the first year, and over 35,000 throughout its duration. Designed to respond to the Improving America's Schools Act, the Goals 2000: Educate America Act, and the School-to-Work Opportunities Act, this program integrates technology into a systemic educational reform effort that improves teaching and learning and leads to the attainment of challenging standards by all students. There are six critical elements of the program:

1) Restructuring

The initiative builds upon efforts by local school districts and communities to restructure school programs to conform with challenging state education standards and locally determined student outcomes. Through the integration of technology into this process, a broad cross-section of community leaders will participate in the articulation of a shared education mission.

2) Utilization

The project uses a collaborative approach for the design and evaluation of technology-enhanced curricula, instruction, and performance assessment. Teams of teachers, curriculum specialists, technology specialists and private software developers identify and implement interdisciplinary projects and strategies that engage students as active learners involved in authentic, community-based learning experiences. Some of the technologies being utilized include CD-ROM and other "open architecture" applications for student-directed learning experiences; interactive, multimedia applications developed by private business partners; multimedia educational materials developed by student/teacher teams; and inquiry applications that utilize the Internet.

3) Professional Development

TEC-RAM collaboration teams work directly in classrooms to model, involve, and support teachers in the process of integrating technology into effective standards-based curriculum and instruction. The collaboration teams include pre-service teachers, so that a major portion of both in-service and pre-service educational technology training can take place in actual classroom settings.

4) Replication

The program is designed to encourage replication in other rural school districts in South Dakota. The initial six demonstration districts serve as models for an additional 12 replication districts that will participate in TEC-RAM through an RFP process.

5) Inclusiveness

The program design is fully inclusive of all students, reflecting an even geographic distribution across the state. One of the initial demonstration districts serves an Indian reservation, which is located in one of the 10 poorest counties in the nation.

6) Access

TEC-RAM emphasizes access to innovative, cost-effective technology and telecommunication resources that enhance teaching and learning. This requires the development of cost-effective, interactive, multi-media applications that extend experiential

learning beyond the limits of the classroom and small rural communities. For schools located in isolated settings with limited communications access, TEC-RAM is implementing packet radio as an alternative to telecommunications via telephone line.

All partners in the TEC-RAM consortium contribute substantially to the human resource capability of the project. Based on their proven readiness, six local school districts have been selected as the initial TEC-RAM consortium demonstration sites. These districts contribute the time and expertise of administrative and specialist staff, along with the substantial, uncompensated time of direct educational staff. The Black Hills Special Services Cooperative, Technology and Innovations in Education (TIE) provides services through its Technology Demonstration and Training Center, the TIE Preview Center, and the TIE Curricula Center. TIE also provides access to South Dakota's Rural Development and Educational Network and several statewide programmatic resources. The South Dakota Department of Education and Cultural Affairs provides access to South Dakota's Rural Development Telecommunications Network. Spring Creek Productions provides video production expertise for the development of products to support project activities and for video-related training activities at the local sites.

The TEC-RAM project brings together a broad range of school systems, communities, state agencies and private industry for the purpose of introducing innovative educational technologies into a rural school system.

Consortium Partners

Aberdeen School District 6-1
Black Hills Special Services Cooperative
Black Hills State University
Dakota State University
Douglas School District 51-1
Hot Springs School District 23-2
Huron School District 02-2
Lake Central School District 39-2
South Dakota Dept. of Education & Cultural Affairs
South Dakota Dept. of Labor
Spring Creek Productions
Todd County School District 66-1

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Socorro Independent School District

El Paso, Texas

A Community of 21st Century Learners for El Paso

"A Community of 21st Century Learners for El Paso" is an ambitious program using technology to rejuvenate the schools in El Paso, Texas. The program goals are to produce within five years: 1) Ten restructured partner schools and a teacher preparation institution, fully connected to the Internet and its resources; 2) 120 teachers who integrate acquired technologies and national standards into the curriculum, and who serve as teacher trainers at 70 other schools; 3) 10,000 students from impoverished neighborhoods who bridge the academic performance gap in state and national standardized tests; 4) 1,000 Hispanic parents utilizing laptop computers in a program to provide technology knowledge and skills; 5) 100 business partners serving as mentors for 200 disadvantaged elementary and high school students; and 6) A "Community of Learners" development change model with emphasis on access to technology to be exported to the 55 schools that are members of the "El Paso Collaborative for Academic Excellence." The program has a strong School to Work component, integrates objectives of the Goals 2000 Act, and ensures ongoing professional development of teachers, administrators and university faculty. There are five major components of the program:

1) Connectivity

Through this grant, the consortium provides computer network connections in 110 classrooms in 10 partner schools. These connections are supported by appropriate software and hardware which includes CD-ROM capability, scanners, color printers, LCD projection panels, video cameras, VCRs, Newton notebook computers, and QuickTake cameras. Additional laptop computers are borrowed by low-income parents for use at home. Technical support is provided by two educational technology experts employed as non-tenure faculty.

2) Staff Development

The program provides resources for 120 teachers to obtain university certification in either of two programs: the Texas Technology Endorsement, or the Instructional Specialist Master's Degree program with emphasis on educational technology and curriculum integration. Each participant will train at least three other teachers in the effective use of educational technologies to improve academic achievement. Funding from this grant will enable the University of Texas at El Paso to provide a course of study uniquely structured for the needs of the participants.

3) Technology Access for Low Income Parents

Each participating school is developing a Parent Center designed to provide parents with training opportunities in English speaking skills, parenting skills, computer use, and instructional support skills. Families may borrow computers for extended periods of time in order to stimulate student achievement, promote parent awareness of the education process, enhance job potential for parents, and involve parents in school activities.

4) E-Mail Business Mentors

The consortium has organized a "Community and Business Liaison" project that is developing a business mentor program at each participating school. Each school is assigned 10 mentors from local businesses, and each mentor is assigned two students. Mentors will

demonstrate the many uses of electronic communications, and will maintain E-mail contact with students throughout the year, providing assistance with school work, and serving as a role-model example of the value of a good education.

5) Sustainability

At the end of five years, all participating schools will have established an advanced level of network connectivity that will remain useful long after the project has ended. The program's post-graduate instruction opportunities will continue to be available at the University of Texas El Paso, and university faculty will continue the integration of technology and standards into their course curricula. Parent development activities will continue, including the role of parents as trainers of teachers for home visits. The El Paso Collaborative for Academic Excellence will disseminate information about the program.

The project provides for a detailed assessment of participants' performance within the university training programs, teacher performance in the school faculty development programs, and student achievement within the core curricula. Student performance is measured against national content standard guidelines for the arts, civics and government, English, foreign languages, geography, history, math and science. The project also provides for evaluations of parent participation and business mentoring support.

The El Paso Challenge Grant consortium is part of a city-wide collaborative for academic excellence, taking advantage of school, home, government and business resources. The program promotes a major systemic reform agenda for education in the El Paso region.

Consortium Partners

El Paso Chamber of Commerce
El Paso Collaborative for Academic Excellence
El Paso Community College
El Paso Hispanic Chamber of Commerce
El Paso Independent School District
El Paso Interreligious Sponsoring Organization
Region XIX Education Service Center
University of Texas at El Paso
Ysleta Independent School District

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Southeast Education Service Center

Price, Utah

State of Utah Resource Web (SURWEB)

The State of Utah Resource Web (SURWEB) is a telecommunication project providing educational opportunities for Utah students who live in poor, rural, or culturally disenfranchised communities. The program was conceived and implemented by a consortium of public and private agencies including Utah's educational service centers, institutions of higher learning, the Far West Laboratory for Educational Research and Development, museums, state parks, national parks, and Native American tribal councils and agencies. The program fits within the framework of the Goals 2000 Act, encourages school reform, and provides comprehensive professional development opportunities. More than 400,000 students will eventually be impacted. There are five major goals of the program:

1) Building Connectivity

SURWEB is a natural extension of two existing educational telecommunication projects in Utah: the Southeast Utah Regional Wide Area Network (SURWAN) and the UtahLink Project. Both networks have a proven record of providing dependable service to schools. The SURWEB project builds on these networks, and adds a World Wide Web capability that enables schools to develop on-line educational resources and applications.

2) Developing Curriculum Applications

A Curriculum Advisory Committee (CAC) guides the development of units of study supported by SURWEB. The CAC is composed of teachers, parents, business representatives, a Utah State Office of Education curriculum specialist, university curriculum specialists, educational service center directors, and information specialists from state agencies. Using state and national school reform goals as a guide, the CAC develops thematic instructional units which integrate subject matter disciplines, introduce real-life issues, and capitalize on local and state resources. Unit subjects include dinosaurs, red rock formations, Native American cultures, ecosystems, pioneering history, and other topics related to the region. This educational material is made available to Utah schools and schools throughout the country via SURWEB and other state networks connected to the Internet.

3) Providing Staff Development

SURWEB is developing and piloting a teacher training program called Utah Internet Institutes that provides instruction in utilizing the resources of the Internet. The Institutes train teachers to access resources via telecommunication, integrate resources into teaching and learning, and evaluate student projects completed over the Internet. In addition, the teachers learn to create their own Internet resources for dissemination on-line. The technical production laboratories at Southern Utah University and the College of Eastern Utah provide training components for the Institutes and assist in the production of related WWW resources.

4) Scaling Up SURWEB

As SURWEB's lead agency, the Southeast Education Service Center (SESC) is working with the other Utah education service agencies to expand the program throughout the state. In the first year of the project, the other service agencies are conducting a series of planning meetings in each of their regions to strengthen regional educational technology planning, coordinate planning across agencies, and integrate the SURWEB project into their plans. In subsequent years, SURWEB will install WWW servers at appropriate sites in each service center, so that these organizations may utilize SURWEB applications in educational technology programs.

5) Evaluating SURWEB

The Far West Laboratory for Educational Research and Development has developed and will implement an evaluation plan for SURWEB. The evaluation design calls for focus group reviews of the program, and large scale mail surveys of students, faculty, parents and community members. The evaluation process is designed to measure the value of SURWEB in changing in the way people seek information, the way they teach, and the way they learn.

Members of the SURWEB consortium are providing support for the program in numerous ways: the Southeast Education Service Center has contributed hardware and software acquired through a Rural Electrification Administration grant; Southern Utah University provides facilities and content specialists in support of professional development activities; the Utah Education Network is contributing the services of an Internet specialist; the Utah State Office of Education is providing ongoing high school maintenance support and Internet training for all teachers in the state; Far West Laboratory is developing and implementing an evaluation plan; the national and state parks and the Indian agencies are providing information specialists; US West is providing technical assistance for a user friendly WWW network. Novell, Inc. will extend education discounts to maximize funds and give more students access to the project.

Consortium Partners

Dinosaur National Monument

Far West Laboratory

Indian Councils/Agencies

National Parks System

Arches

Bryce Canyon

Canyonlands

Capitol Reef

Zion

Novell, Inc.

Office of Museum Services

Service Centers:

Central Utah Educational Services

Northeastern Utah Educational Services

Southeastern Educational Service Center

Southwest Educational Development Center

Southern Utah University

US West Communications

Utah Education Network

Utah State Office of Education

Utah State Parks System (includes 45 parks)

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Montpelier School District

Montpelier, Vermont

The WEB Project

The WEB Project, subtitled "Creating a WEB of Evidence of Student Performance in Nonverbal Inquiry and Expression," is a consortium of state agencies, private industries, and educational institutions that are utilizing new technologies to effect systemic reform in school systems throughout Vermont. The project utilizes multimedia telecommunication 1) as an educational environment for student inquiry and expression, 2) as a medium for presenting and evaluating student work, and 3) as a virtual faculty room for fostering professional discussions about standards of excellence in education. The focus of the WEB Project is the arts, humanities and the social sciences. More than 200 students are participating in the first year, and within five years the program will expand to involve over 2,000 students throughout the state. This program fits within the framework of the Goals 2000 Act, promotes professional development, contains strong evaluation and dissemination components and is designed to merge with the overall state education reform initiative. The program has three major elements:

1) Cooperating School Districts

In three pilot Vermont school districts, the WEB Project is demonstrating the connections between educational standards, curriculum, instruction and assessment. Each school district is provided five "computer suites" for use in central locations within schools. Students use these high performance computers to digitize text, graphics, and full motion video files for use by other students in a variety of educational projects. The program enables classes to:

- Focus on the articulation of K-12 standards of performance
- Prepare students to create multimedia presentations and electronic portfolios to demonstrate learning
- Digitize images of student performances as benchmarks of standards, and publish the images on the World Wide WEB (WWW) for assessment and feedback
- Increase student understanding of the roles of technology and its application
- Introduce or upgrade multimedia authoring technology and provide training in its use

2) Professional Organizations

With the cooperation of the Vermont Arts Assessment Project and the Vermont Alliance for Arts Education, the WEB Project is providing educational standards-based training to teachers who represent school systems across the state. These teachers receive computers and video cameras that are used to digitize educational materials for review, and they learn to assess student work according to the Vermont Arts Assessment standards. Their training and expertise are shared with other teachers in their districts.

3) Action Researchers

The WEB Project trains instructors to utilize multimedia in teaching dance, music composition, multimedia authoring, and other skills. Training is conducted by "action researchers," stationed at "action research sites" throughout the state. Action researchers provide technical support for the WEB Project, keep journals of student activities, and digitize performance information.

Through the WEB Project, students use technology to build on their knowledge and skills, and they are provided opportunities to practice what they have learned. They come into contact with a wide range of adults in teaching and mentoring roles, particularly working artists, writers, composers, videographers, dancers, historians and others. They expand peer relationships through

sharing work and reflecting on the work of others. They learn to evaluate their own work based on objective standards of quality. They learn specific skills related to using telecommunication and multimedia, designing World Wide WEB (WWW) pages, presenting their work via telecommunication, writing, problem solving, and making valuable connections between art, humanities, sciences and social sciences.

Through the WEB Project, teachers are provided numerous opportunities for professional development. Local schools release teachers for professional training, and provide time and resources needed to take advantage of the local capacities being built by the program. A core group of teachers in each participating school is given time every day to support project activities. Statewide partners include WEB Project schools in summer institute plans, follow-up activities and networking support.

The IBM corporation is working closely with the state of Vermont to support its educational reform initiative. Each of the WEB Project schools is receiving educational technology funding from IBM, as well as technical assistance in developing record-keeping software that may be marketed nationwide. The Vermont Institute for Science, Mathematics and Technology (VISMT), through a National Science Foundation grant, is helping to coordinate WEB Project activities with other education reform projects in the state, and conducting statewide professional development programs to promote the use of technology in education.

Through the use of technology, the WEB Project is helping to renew the teaching of arts and humanities, promoting systemic education reform, and encouraging professional growth in school systems throughout the state of Vermont.

Consortium Partners

Franklin Northeast Supervisory Union
IBM
Montpelier School System
Proctor Junior-Senior High School
Vermont Arts Assessment Project
Vermont Institute for Science, Mathematics, and Technology (VISMT)

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Improving America's Schools Act of 1994, Public Law 103-382

Subpart 1--National Programs for Technology in Education SEC. 3121. NATIONAL LONG-RANGE TECHNOLOGY PLAN.

(a) In General.--The Secretary shall develop and publish not later than 12 months after the date of the enactment of the Improving America's Schools Act of 1994, and update when the Secretary determines appropriate, a national long-range plan that supports the overall national technology policy and carries out the purposes of this part.

(b) Plan Requirements.--The Secretary shall--

(1) develop the national long-range plan in consultation with other Federal departments or agencies, State and local education practitioners and policymakers, experts in technology and the applications of technology to education, representatives of distance learning consortia, representatives of telecommunications partnerships receiving assistance under the Star Schools Act, and providers of technology services and products;

(2) transmit such plan to the President and to the appropriate committees of the Congress; and

(3) publish such plan in a form that is readily accessible to the public.

(c) Contents of the Plan.--The national long-range plan shall describe the Secretary's activities to promote the purposes of this title, including--

(1) how the Secretary will encourage the effective use of technology to provide all students the opportunity to achieve State content standards and State student performance standards, especially through programs administered by the Department;

(2) joint activities in support of the overall national technology policy with other Federal departments or agencies, such as the Office of Science and Technology Policy, the National Endowment for the Humanities, the National Endowment for the Arts, the National Institute for Literacy, the National Aeronautics and Space Administration, the National Science Foundation, the Bureau of Indian Affairs, and the Departments of Commerce, Energy, Health and Human Services, and Labor--

(A) to promote the use of technology in education, training, and lifelong learning, including plans for the educational uses of a national information infrastructure; and

(B) to ensure that the policies and programs of such departments or agencies facilitate the use of technology for educational purposes, to the extent feasible;

(3) how the Secretary will work with educators, State and local educational agencies, and appropriate representatives of the private sector to facilitate the effective use of technology in education;

(4) how the Secretary will promote--

(A) higher achievement of all students through the integration of technology into the curriculum;

(B) increased access to the benefits of technology for teaching and learning for schools with a high number or percentage of children from low-income families;

(C) the use of technology to assist in the implementation of State systemic reform strategies;

(D) the application of technological advances to use in education;

(E) increased access to high quality adult and family education services through the use of technology for instruction and professional development; and

(F) increased opportunities for the professional development of teachers in the use of new technologies;

(5) how the Secretary will determine, in consultation with appropriate individuals, organizations, industries, and agencies, the feasibility and desirability of establishing guidelines to facilitate an easy exchange of data and effective use of technology in education;

(6) how the Secretary will promote the exchange of information among States, local educational agencies, schools, consortia, and other entities concerning the effective use of technology in education;

(7) how the Secretary will utilize the outcomes of the evaluation undertaken pursuant to section 3123 to promote the purposes of this part; and

(8) the Secretary's long-range measurable goals and objectives relating to the purposes of this part.

STRATEGIES

1. Expand access to the information highway. The Department will:

- 1.1 work with officials at all levels of government to examine federal and state rules and local pricing systems that stand in the way of increased educational access to telecommunications;
- 1.2 will identify and publicize successful innovative state and local technology financing strategies (e.g., district or state wide purchasing contracts, bonds etc.);
- 1.3 track progress toward connecting every classroom to the information highway (OERI);
- 1.4 will work with architects' organizations, and others to develop exemplary school design;
- 1.5 monitor key issues such as privacy and intellectual rights.

2. Support teachers. The Department will:

- 2.1 help improve teacher preparation by forming partnerships with national and state teacher preparation organizations;
- 2.2 help integrate technology into the skills required for certification and re-certification of teachers by collaborating with national and state accreditation bodies;
- 2.3 work with NSF, Commerce and Energy Departments to set common goals for federally funded professional development activities on the use of technology, especially through the Eisenhower Professional Development program;
- 2.4 encourage and support distance learning networks for professional development and information sharing;
- 2.5 help develop model staff development programs.

3. Improve tools and software. The Department will commit itself to:

- 3.1 addressing the concern about interoperability standards;
- 3.2 requiring development of high quality learning tools, improved software and more flexible platforms in its title 1, adult literacy, school-to-work, bilingual education, english as a second language and special education programs;
- 3.3 building demand for better products;
- 3.4 examine existing R & D incentives and strategies to bring new products to the classroom.

4. Provide analysis and independent, trustworthy advice on:

- 4.1 R & D to improve learning beyond current capabilities;
- 4.2 the effectiveness of new education and training technologies;
- 4.3 interagency, intergovernmental and industry partnerships to increase learning productivity;
- 4.4 the availability of technical assistance capabilities from regional centers, laboratories, consortia.

5. Build new alliances with State and local educators and the private sector by:

- 5.1 expanding partnerships;
- 5.2 integrating technology into school improvement efforts through such programs as Goals 2000;
- 5.3 working with Commerce, and Labor to create alliances with business leaders, public education, higher education and other organizations;
- 5.4 improving cooperation between federal program administrators (such as title 1) and software programming and content developers.

U.S. Department of Education New World Wide Web Home Page

September 8, 1995

Keith
Stallins

On September 8, the National Library of Education unveiled the U.S. Department of Education's new World Wide Web (WWW) home page. The home page is the entrance to the Department's "Online Library"--an electronic collection of useful information for teachers, parents, policymakers, researchers, and others with a stake in American education.

The World Wide Web has grown phenomenally in the year and a half since the Department's original home page was created. The Online Library has nearly doubled in size and now contains more than 11,000 files, ranging from short grant announcements and press releases to the full text of major Department publications, plus lots of information on key initiatives such as Goals 2000, family involvement, and technology.

Public use of the Online Library has nearly tripled in the last year. In August, the system received more than 750,000 file/menu requests from Internet users in 71 countries on six continents. Frequent visitors come not only from universities and government agencies, but increasingly from state K-12 education networks, community freenets, and commercial networks such as America Online and Prodigy--an indication that individuals and families are using the library.

In January, *Internet World* named the Department's Internet site one of the 15 most useful educational resources on the Internet. *PC Week* (August 1995) says the ED WWW site is the place to start for information about educational technology. America Online and Apple's eWorld network selected it as a featured database for their users. PointCom, a major Internet reviewer of World Wide Web sites, rates it "excellent." Many new Internet books recommend it for its content and design.

At the opening session of the Federal Webmaster Workshop in July, David Lytel of the White House Office of Science and Technology Policy (OSTP) cited the Department's WWW version of the *Teacher's Guide to the U.S. Department of Education* as an excellent example of how to make a complex body of information appear simple and understandable to an agency's customers.

The Department's new home page extends that approach to the entire Online Library. It organizes a large body of information clearly and logically, makes it easy for visitors to find the information they need, and gives the Department an attractive, professional-looking public presence on the Internet.

One powerful new feature lets a visitor search the full text of the entire library for a word or phrase. A search for "family involvement" returns numerous references including full-text publications, press releases, bibliographies, and research and statistics on the topic.

Mouse-equipped visitors can click on a U.S. map to get a list of resources and services in

or phrase. A search for "family involvement" returns numerous references including full-text publications, press releases, bibliographies, and research and statistics on the topic.

Mouse-equipped visitors can click on a U.S. map to get a list of resources and services in their state or click on an ED organizational chart to go to a Principal Office's home page. The system provides a text-only equivalent for all graphical features to accommodate visually impaired users and the still substantial portion of the education community with slow modems, older equipment, or text-only Web browsers.

The URL (Uniform Resource Locator) for the new home page is <http://www.ed.gov>. For further information, call Keith Stubbs at 219-1803 or send Internet email to webmaster@inet.ed.gov.

Home Gopher server: gopher.ed.gov

1. About This Gopher/
2. What's New in This Gopher/
3. Search this Gopher by Key Words (Jughead)/
4. Updates on Legislation, Budget, and Activities of the Department/
5. Department-wide Initiatives (Goals 2000...)/
6. U.S. Department of Education Programs-General Information/
7. Educational Research, Improvement, and Statistics (OERI & NCES)/
8. Elementary and Secondary Education (OESE), and Early Childhood/
9. School-to-Work, Vocational and Adult Education (OVAE)/
10. Special Ed. & Individuals w/ Disabilities Act (OSERS & IDEA)/
11. Announcements, Bulletins, and Press Releases/
12. U.S. Department of Education/OERI Publications/
13. Educational Software/
14. U.S. Department of Education Phone Directory <CSO>
15. Other Education Gophers and VERONICA Searches/

Updates on Legislation, Budget, and Activities of the Department

1. About this Directory
2. 95/09/15: Impact of Senate Appropriations Committee Action
3. 95/08/22: Impact of House Appropriations Action
4. 95/08/10: Statement of Principles on Religion in Public Schools
5. Program Terminations -- FY 1996 Appropriation Action
6. Remarks by the President on Religious Liberty in America
7. Briefing by Riley and Dellinger on Expression of Religion
8. Richard Riley op-ed in The Washington Post
9. Riley's Testimony on Departmental Reorganization
10. Testimony on IDEA before Subcomm. on Early Childhood, Youth & Famil..
11. President's Budget Plan: Investing in Education and Training
12. President's Remarks on Safe and Drug-Free Schools (06/07/95)
13. How We Help America Learn: A Summary of Major ED Activities
14. Under Secretary's Testimony before Committee on Reform & Oversight ..

Department-wide Initiatives (Goals 2000...)

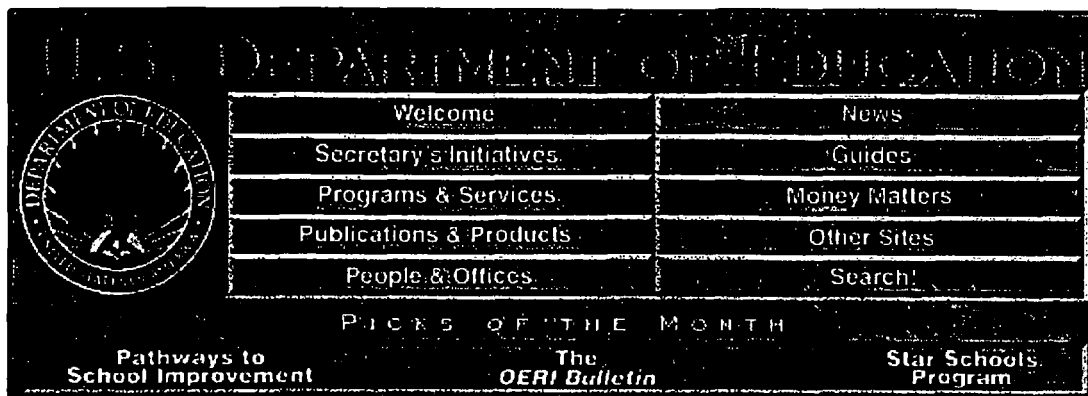
1. About This Directory
2. Goals 2000 Initiative/
3. Standards & Documents About Standards/
4. Technology/
5. Family Involvement/
6. Flexibility and Waivers/

Technology

1. Advanced Telecommunications in U.S. Public Schools, K-12 (ED TAB)
2. Annual Secretary's Conference on Educational Technology/
3. Challenge Grants Information/
4. National Technology Plan List Archive/
5. Resource Guide to Federal Funding for Technology in Education
6. Teachers and Technology: Making the Connection (from OTA) <HTML>
7. Telecomputing for Teaching and Learning/
8. Testimony of Dep. Secretary before Senate (April 4, 1995)
9. Testimony of Secretary before Senate Committee (May 25, 1994)
10. Tools for Transforming Teaching & Learning/

Goals 2000 Initiative

1. About this Directory
2. Guidance for Reviewing Plans Under the Goals 2000
3. National Education Goals & Goals Panel Reports/
4. Goals 2000 - A Progress Report/
5. Overview, Fact Sheets, and other information/
6. Legislation -- The Goals 2000: Educate America Act/
7. Misconceptions About Goals 2000
8. GOALS 2000 Community Updates (Newsletters)/
9. Guidance -- Questions & Answers/
10. An Invitation to Your Community/
11. Teachers and GOALS 2000/
12. Estimated Allocations for States in 1994/
13. State Applications/
14. State Plans/
15. Satellite Town Meetings & Background Papers/
16. 50 Simple Things You Can Do
17. 1995 Goals 2000 Teacher Forum Teleconference/



Welcome

What is the Department of Education? Read this brief introduction to learn about the Department, its mission and goals for American education, and also discover some of the special features that this Web site has to offer.

News

What's making the news at the Department of Education? Look in here for pointers to the latest information we've added, including: announcements of new funding opportunities, press releases, transcripts of speeches and testimony made by Secretary Richard Riley, and updates on current legislation and our budget.

Guides

If you are a **teacher** or a **researcher** you have specialized information needs and interests. What resources does the Department make available especially for you? The answer is "lots!" So much, in fact, that we publish two books about what we have to offer -- one for teachers (*Teacher's Guide to the Department of Education*) and another for researchers (*Researcher's Guide to the Department of Education*). We're also starting to collect links to ED-sponsored Internet resources for **parents**.

Money Matters

If you're interested in applying for a grant or contract, here's information you'll need to know. Department guidelines, regulations, and funding opportunities are available here. Interested in student financial assistance? That's in this section too. If it's about money, you'll find it in Money Matters.

Secretary's Initiatives

What are the programs highlighted by the Department? You'll find information and publications about our major initiatives, including Goals 2000, School-to-Work, School-Wide Programs, Family Involvement, Technology, Flexibility and Waivers, the reauthorization of the Elementary and Secondary Education Act, and the Individuals with Disabilities Education Act (IDEA).

People and Offices

Who's who at the Department of Education? Check the Department's organizational chart, which leads to information about program offices, organizational units, key staff, and a listing of programs managed by each office. You'll also find where we're located -- both in Washington and around the nation. In

addition, there's a searchable phone directory so that you can find the person who has answers you need.

Programs and Services

What programs does the Department sponsor? What services are available in your state? Check out the new dynamic map of the United States to identify resources and services in your area. Read about the Department's major program themes and then use the *Guide to ED Programs* to lead you to as much detail as you want about individual programs.

Publications and Products

Have we got a document for you! You'll find the full text of many of our publications, all marked-up and ready to be read or searched. Other documents are available via our Gopher system, too.

Other Sites

In addition to this site, there are many educational resources available online around the world. This section provides links to some public sites of interest to teachers, students, and researchers. We've also put together a list of Department-funded or affiliated sites and services.

Search!

Use great information retrieval tools to find documents at this site or elsewhere on the Internet.

Picks o' the Month

We pick three great resources every month and highlight them here for you. Our picks are taken from three broad categories: ED-affiliated Internet sites elsewhere, newly available documents of merit, and new selections at this site focusing on individual ED programs and offices.



Last update October 1, 1995 (BNS).

YOU ARE INVITED TO JOIN EDINFO...

a free information service that delivers 2-3 e-mail messages per week from the U.S. Department of Education.

Each message features one report or initiative (or other information) from the U.S. Department of Education. Past messages have described...

what you should know about ED grants, Challenge grants awards, Fun Learning Activities for Parents & Children, *Strong Families, Strong Schools*, Goals 2000 publications, *Preparing Your Child for College*, back to school (including a "partners' activity guide"), *Prisoners of Time*, satellite town meetings, the Helping Your Child series, READ*WRITE*NOW!, student guide to financial aid, *Special Strategies for Educating Disadvantaged Children*, technology resource guide, budget updates, our Individuals with Disabilities Education Act proposal, other legislation, research & statistics (*The Condition of Education*) & more.

Most messages include a summary, an excerpt, and where you can get more information. (Please note that EDInfo messages are longer than most e-mails -- typically 3-4 printed pages.)

Topics covered thus far - see next page.

TO TAKE ADVANTAGE OF THIS SERVICE, SIMPLY...

1. Address an e-mail message to:

listproc@inet.ed.gov

2. Write this (and nothing else) in the message:

subscribe EDInfo yourfirstname yourlastname

(If you have a signature block, please turn it off.)

Please share this with your colleagues & friends!

Have a question about EDInfo? Please send it to:

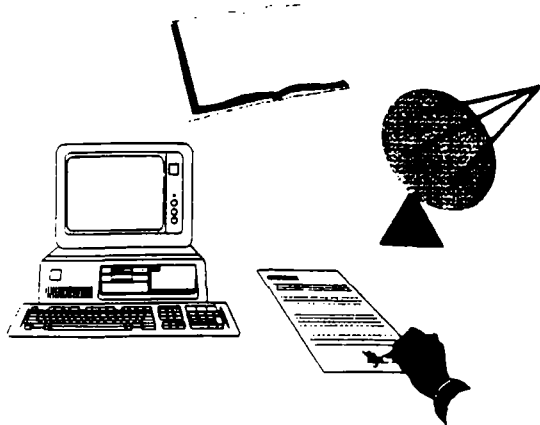
Kirk Winters
U.S. Department of Education
kirk_winters@ed.gov

*2800 on list (teachers, principals, superintendents, administrators...)
500 responses one week. All positive &c. 2*

INDEX for EDInfo -- The 36 Messages

These are titles of all EDInfo messages posted during the pilot test (June - September 1995).

1. Satellite Town Meeting (Learning to Read) -- June 19
2. GOALS 2000 Progress Report -- June 21
3. Updates on Legislation, Budget & Activities -- June 23
4. What Should I Know About ED Grants? -- June 26
5. An Invitation to Your Community -- June 28
6. IDEA proposal (Secretary's Testimony) -- June 30
7. Secretary's *Washington Post's* op-ed -- July 5
8. New "At-Risk Institute" on the World Wide Web -- July 6
9. Community Update Newsletter -- July 7
10. Preparing Your Child for College -- July 10
11. READ*WRITE*NOW! (Fact Sheet) -- July 12
12. Budget Update (House Appropriations Subcommittee) -- July 15
13. Ask a Question? -- July 17
14. Prisoners of Time -- July 20
15. Fun Learning Activities for Parents & Children -- July 25
16. 20 Questions -- July 26
17. Budget Update (House Appropriations Committee) -- July 28
18. Special Strategies for Educating Disadvantaged Children - July 31
19. Who Can Play? -- August 3
20. Student Guide to Financial Aid from the Department -- Aug. 4
21. Nation at Risk -- August 8
22. Strong Families, Strong Schools -- August 10
23. Back to School (Community Update & Announcement) -- Aug. 12
24. Regional Education Laboratories -- August 16
25. National Technology & Information Agency Report -- August 21
26. Condition of Education -- August 22
27. Teachers and Goals 2000 -- August 27
28. Religious Expression in Public Schools -- August 29
29. Partners' Activity Guide -- September 2
30. Technology Resource Guide -- September 7
31. Redesigned Home Page -- September 8
32. Budget Update (Full House of Representatives) -- Sept. 11
33. Satellite Town Meeting (Technology in Education) -- Sept. 13
34. Systemic Reform: Perspectives on Personalizing Education -- Sept. 15
35. Budget Update (Senate Committee Action) -- September 19
36. President's Technology Speech & NTPlan Archive -- Sept. 27



CCSSO National Workshop on Learning Technology: Linking Technology to Comprehensive Improvement Plans October 23-24, 1995

Holiday Inn Crowne Plaza Ravinia ♦ 4355 Ashford-Dunwoody Road ♦ Atlanta, Georgia 30346
Phone (404) 395-7700 ♦ Fax (404) 392-9864

OVERVIEW

In order to achieve goals for improved education, educators must harness technology's potential to: (1) enhance curriculum, instruction, and assessment; (2) improve administration and management; (3) increase access to educational resources; and (4) provide opportunities for collaboration and professional development among educators. One of the most important elements during the first phase of Goals 2000 has been the development of state plans for learning technologies. A key challenge of full implementation will be the continued coordination of technology with the overall state improvement programs. To support states in meeting these challenges, this conference will bring education leaders together with state technology representatives, technology researchers, and experts from business and industry to articulate clear links between uses of technology and the National Education Goals.

OBJECTIVES

Participants will work together to:

- ✎ *Create and support partnerships within their state to integrate technology plans with overall education improvement programs.*
- ☐ *Identify the role of technology in all aspects of education reform and develop specific action steps for addressing those roles within their state's education improvement programs.*
- ⊕ *Collaborate with other states on successful strategies for successful technology planning and effective implementation.*

Agenda

Monday, October 23

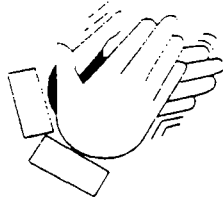
- | | | |
|---------------------|--|---------------------------|
| 10:30 am - 10:45 am | The Challenge and the Charge
<i>Speakers: John T. MacDonald, CCSSO</i>
<i>Frank Withrow, CCSSO</i> | <i>Dunwoody Suite</i> |
| 10:45 am - 11:30 am | Goals 2000 and the National Technology Plan (TAB 1)
<i>Speakers: Michael Cohen, U.S. Dept. of Education</i>
<i>Linda Roberts, U.S. Dept. of Education</i> | |
| 11:30 am - 12:30 pm | Luncheon Buffet | <i>Ballroom F & G</i> |

12:30 pm - 1:30 pm	Panel Discussion (TAB 2) Integrating Technology with Comprehensive Plans: State Stories <i>Moderator: Don Merck, CA Dept. of Education</i> <i>Panel: Julia Stapleton, NJ Dept. of Education</i> <i>Brenda Williams, WV Dept. of Education</i> <i>Kurt Steinhaus, NM Dept. of Education</i>	<i>Dunwoody Suite</i>
1:45 pm - 2:45 pm	Small Group Discussions: Integrating Technology Plans <i>See Tab 2 for additional information</i>	<i>Oakwood A, Oakwood, B</i> <i>Maplewood A, Maplewood B</i>
3:00 pm - 4:00 pm	Panel Discussion: Implementing Technology Applications: State Stories (TAB 3) <i>Moderator: John Phillipo, Center for Educational Leadership and Technology</i> <i>Panel: Elsie Brumback, NC Dept. of Public Instruction</i> <i>Cecil McDermott, AR Dept. of Education</i> <i>Carol Rocque, CT Dept. of Education</i>	
4:15 pm - 5:15 pm	Small Group Discussions: Implementing Technology Applications <i>See Tab 3 for additional information</i>	<i>Oakwood A, Oakwood, B</i> <i>Maplewood A, Maplewood B</i>
5:30 pm - 6:30	Cash Bar	<i>Ballroom B & C Foyer</i>
6:30 pm - 8:00 pm	Dinner Textbooks of the Future (TAB 4) <i>Speakers: Gary Rowe, Turner Educational Services, Inc.</i> <i>Jay Suber, CNN</i> <i>Bernie Mitchell, Phillips Media Professionals</i>	<i>Ballroom B & C</i>
8:00 pm - 12:00 pm	Hospitality Suites (TAB 5)	<i>TBA</i>

Tuesday, October 24

7:30 am - 8:30 am	Breakfast	<i>Dunwoody Foyer</i>
8:30 am - 9:00 am	Integrating Technology into State Education Improvement Plans (TAB 6) <i>Speaker: Ruth A. McKenna, California Department of Education</i>	<i>Dunwoody Suite</i>
9:00 am - 10:15 am	Panel Discussion: Technology for Curriculum and Instruction (TAB 7) <i>Moderator: Barbara Kapinus, CCSSO</i> <i>Panel: Barbara Reeves, Maryland Department of Education</i> <i>Elizabeth Goldman, Vanderbilt University</i> <i>Peter Grunwald, Grunwald Associates</i> <i>Kenneth Komoski, EPIE Institute</i>	

10:15 am - 10:30 am	Break	
10:30 am - 12:30 pm	Small Group Discussions: Critical Issues (TAB 8) * <i>Policy alignment - Oakwood A</i> <i>Telecommunications policy - Oakwood B</i> <i>Working with developers & service providers - Maplewood A</i> <i>Informing and engaging the public about technology - Maplewood B</i>	* See Below
12:30 pm - 1:30 pm	Lunch Technology in the Context of Educational Improvement (TAB 9) <i>Introduction: Bill Wright, Consortium for School Networking</i> <i>Speaker: Christopher Dede, George Mason University</i>	Ballroom F & G
1:30 pm - 3:00 pm	Panel Discussion: Software Development (TAB 10) <i>Moderator: David Byer, Software Publishers Association</i> <i>Panel: Kathy Hurly, Skills Bank</i> <i>Michael Jay, Chancery Software</i> <i>James Schnitz, IBM K-12 Education</i> <i>Karen Billings, Microsoft</i>	Dunwoody Suite
3:00 pm - 3:15 pm	Break	
3:15 pm - 4:15 pm	Panel Discussion: Technology for Administration and Management (TAB 11) <i>Moderator: To Be Announced</i> <i>Panel: Janet Azbell, IBM K-12 Education</i> <i>Jake Schlumpf, Apple Computer Inc.</i> <i>Saul Rockman, Rockman et al</i>	
4:15 pm	Adjourn	



*The Council of Chief State School Officers
would like to express their gratitude
to the following organizations
who have generously supported the*

*National Workshop on Learning Technology:
Linking Technology to Comprehensive Improvement Plans*

*by sponsoring the various meal functions
enjoyed by workshop participants on
October 23-24, 1995:*

*Apple Computer, Inc.
Jostens Learning
Lightspan Partnership
MGT of America, Inc.
Microsoft Corporation
TCI Educational Technologies, Inc.*

The Charge

Frank B. Withrow
Council of Chief State School Officers
October 23, 1995

It takes about 40 years for a new technology to be completely assimilated into a society. The transition in the United States from steam power to electricity took about 40 years. The United States was the first nation to make this conversion and as a long range consequence they eventually dominated industrial production. The shift to digital power, i.e., the control of everything through computing is again repositioning people and nations around the world.

The industrial age substituted machinery for physical power. The information age is expanding memory or intellectual power. In any revolution there is a decline in productivity until the workers have mastered the new systems. In the transformation from steam to electricity industrial productivity dropped in the first ten years until workers began to adjust to and understand electrical power. In the 1980s American business and industry invested over one trillion dollars in computer and communications technologies without a noticeable increase in productivity. In fact in some instances productivity declined. In the mid 90s we are beginning to see the payoff. For example, we are producing more and better steel today with smaller computer controlled with one seventh of the work force of two decades ago. We are an incredibly productive society.

We say schools are the last to adopt the new technologies and that educators are behind the curve of change. As we will see in this conference there are many interesting and compelling examples of successful implementation of computing and communications technologies being implemented in state after state.

Our charge is to ensure that technology is integrated into the reforms being brought about through Goals 2000. The standards created by Goals 2000 enable us to match technological resources to specific elements of learning and teaching that meet new academic standards. To fully implement Goals 2000 technology must do several things.

Learning management tools: Teachers must have access to software that identifies the instructional elements or frameworks and matches them to lesson plans, material resources, and assessment techniques. Such a tool should be on each teacher's desk.

Instructional and communications tools: Teachers and students must have access to Internet and other online services that can serve the needs of teachers.

**CCSSO National Workshop on Learning Technology:
Linking Technology to Comprehensive Improvement Plans
October 23-24, 1995
Crowne Plaza Ravinia ♦ Atlanta, Georgia**

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(as of October 19, 1995)

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*Schedule for my
State School
District Learning*

The White House
Office of the Press Secretary

For Immediate Release

April 19, 1997

April 18, 1997

Memorandum For The Heads Of Executive Departments And Agencies

Subject: Expanding Access to Internet-based Educational
Resources for Children, Teachers, and Parents

My number one priority for the next 4 years is to make sure that all Americans have the best education in the world.

One of the goals of my Call to Action for American Education is to bring the power of the Information Age into all of our schools. This will require connecting every classroom and library to the Internet by the year 2000; making sure that every child has access to modern, multimedia computers; giving teachers the training they need to be as comfortable with the computer as they are with the chalkboard; and increasing the availability of high-quality educational content. When America meets the challenge of making every child technologically literate, children in rural towns, the suburbs, and inner city schools will have the same access to the same universe of knowledge.

I believe that Federal agencies can make a significant contribution to expanding this universe of knowledge. Some agencies have already launched a number of exciting projects in this area. The White House has a special "White House for Kids" home page with information on the history of the White House. Nasa's K-12 initiative allows students to interact with astronauts and to share in the excitement of scientific pursuits such as the exploration of Mars and Jupiter and with experiments conducted on the Space Shuttle. The AskERIC service (Education Resources Information Center), supported by the Department of Education, has a virtual library of more than 900 lesson plans for K-12 teachers, and provides answers to questions from educators within 48 hours -- using a nationwide network of experts and databases of the latest research. Students participating in the Vice President's Globe project (Global Learning and Observation for a Better Environment) collect actual atmospheric, aquatic, and biological data and use the Internet to share, analyze, and discuss the

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data with scientists and students all over the world. With support from the National Science Foundation, the Department of Energy, and the Department of Defense's Caeti program (Computer-Aided Education and Training Initiative), the Lawrence Berkeley Laboratory has developed a program that allows high school students to request and download their own observations of the universe from professional telescopes.

We can and should do more, however. Over the next 3 months, you should determine what resources you can make available that would enrich the Internet as a tool for teaching and learning, and produce and make available a new or expanded version of your service within 6 months.

more

(Over)

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You should use the following guidelines to support this initiative:

Consider a broad range of educational resources, including multimedia publications, archives of primary documents, networked scientific instruments such as telescopes and supercomputers, and employees willing to serve as tele-mentors or answer student and teacher questions.

Expand access not only to the information and other resources generated internally, but by the broader community of people and institutions that your agency works with and supports. For example, science agencies should pursue partnerships with professional societies, universities, and researchers to expand K-12 access to scientific resources.

Update and improve your services in response to comments from teachers and students, and encourage educators to submit curricula and lesson plans that they have developed using agency material.

Focus on the identification and development of high-quality educational resources that promote high standards of teaching and learning in core subjects. Of particular importance are resources that will help students read well and independently by 4th grade, and master challenging mathematics, including algebra and geometry, by 8th grade.

Make sure the material you develop is accessible to people with disabilities. Earlier this month, I announced my support for the Web Accessibility Initiative, a public-private partnership that will make it easier for

people with disabilities to use the World Wide Web.

I am also directing the Department of Education to develop a "Parents Guide to the Internet," that will explain the educational benefits of this exciting resource, as well as steps that parents can take to minimize the risks associated with the Internet, such as access to material that is inappropriate for children.

The Department of Education will also be responsible for chairing an interagency working group to coordinate this initiative to ensure that the agency-created material is of high quality, is easily accessible, and promotes awareness of Internet-based educational resources among teachers, parents, and students.

William J. Clinton

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