

more accessible to children.* CED stated that business, government, and education should develop partnerships with public schools to share resources, knowledge, and technology. They further provided that the ability to access information should no longer be considered an educational frill; it should be recognized as a necessary part of education and, therefore, an essential item in the regular school budget. Their report recognizes that increased competition among providers will ultimately result in fairer pricing for all, but such competition will take time to take hold, and schools need more affordable access now. CED called on federal, state, and local policymakers, in cooperation with the private sector, to develop new incentives and strategies so that schools can gain affordable access to communications services. In addition, CED stated that any strategies that are developed to provide affordable access to schools should ensure that costs are shared.

We believe that the Federal Communications Commission (FCC) is the government entity best equipped to take on such a task. The Network Reliability Council, established by the FCC in 1991 to address national reliability concerns, should serve as a model for how the FCC could effectively work towards meeting the goal of maximizing the usefulness of telecommunications in preparing children for the information age. The Network Reliability Council successfully assembled diverse groups to study a particular problem, recommend solutions, and find effective ways to implement those recommendations.

If the FCC were to establish an Education Telecommunications Council to address the telecommunications needs of the nation's elementary and secondary schools and libraries, it would call on representatives from local exchange companies, interexchange companies, cable companies, cellular companies, computer firms, software developers, educators, and state and local governments. In this manner, the Education Telecommunications Council would be expected to partner with educational agencies and serve as an impartial central clearinghouse so that the efforts of the telecommunications industry in the educational field are subject to appropriate coordination and carried out in a way that most effectively meets the needs of the educational sector. Thus, entities that seek to maximize the usefulness of advanced technology to access information would be able to

* The Committee for Economic Development is a nonprofit, nonpartisan independent research and policy organization of some 250 business leaders and educators. This recommendation was contained in its September 1995 report, "Connecting Students to a Changing World: A Technology Strategy for Improving Mathematics and Science Education."

make more fully informed decisions. The Education Telecommunications Council, as an impartial central coordinator, would thus be expected to contribute to the implementation of a truly nationwide information infrastructure.

INDUSTRY CONTRIBUTIONS

I. Cable's Contribution to Education

Cable television has dedicated considerable resources to ensure that students are an integral part of the information revolution. The cable industry has voluntarily provided people, programming, and equipment to schools so that teachers and students may experience firsthand the benefits of a broadband communications network.

Many cable television companies are developing instructional programming and teacher support materials, connecting schools, providing distance learning, and contributing audio-visual equipment, teaching guides, and satellite dishes at cost. Cable companies are buying copyright clearances on behalf of educators and training administrators, teachers, students, and parents to effectively incorporate new educational delivery technologies, equipment, programming, and software into the classroom environment.

CONNECTING SCHOOLS

Thirty-two national cable networks have teamed up with more than 7,200 local cable systems to create Cable in the Classroom, a public service initiative of the cable television industry. Through Cable in the Classroom, the cable industry has invested more than \$320 million to provide more than 70,000 schools (70 percent of public and private schools) with the "Information Superhighway" at their doorsteps. Through cable connections provided free of charge, four out of five students—numbering some 38 million—receive direct access to many of the electronic services on the information superhighway and more than 525 hours per month of educational, commercial-free programming. Teachers also receive complimentary curriculum-related support materials and *Cable in the Classroom* magazine, a monthly publication that lists upcoming educational programs by subject area. A 1995 technology survey conducted for Cable in the Classroom and four other national education groups indicated 58 percent of the teachers surveyed regularly use the Cable in the Classroom resources in their classrooms.

TRAINING

Research has shown that teachers are more likely to use resources like Cable in the Classroom if they have been trained in the application of such resources to the curriculum. The cable industry has sponsored thousands of hours of training for educators during teacher "in-service" sessions. Books, videotapes, and lesson plans are available to schools at no charge.

The J.C. Sparkman Center, developed by Tele-Communications, Inc. (TCI), is a state-of-the-art training facility in a special digital satellite transmission center where educators, school administrators, and parents get hands-on training with cable-delivered resources in a variety of technologies, including computer and CD-ROM applications, information access, multimedia development, desktop video conferencing, and video disc technology. Three hundred and seventy scholarships were financed by TCI in 1995. The average participant cost is \$2,500, or 10 times the annual expenditure on teacher training nationwide.

Through The Family and Community Critical Viewing Project, a collaboration of the National Parent Teacher Association, National Cable Television Association, and Cable in the Classroom, cable operators are conducting hundreds of workshops helping parents and children become smarter television viewers. To assist parents in this effort, Continental Cablevision developed an award-winning bimonthly magazine, *Better Viewing*, which lists quality children's programming by age and provides tips on using television productively in the home.

INTERACTIVE AND DISTANCE EDUCATION

Satellite-based distance learning networks like Mind Extension University (ME/U) have been developed by cable companies to provide quality instructional education to remote locations. Media General Cable and the Fairfax, Virginia public school system have the only "local" distance learning program created by K-12 educators to serve teachers and students nationwide. As many as 13,000 schools have participated in this network drawing on the talents of exemplary teachers and innovative instructional designers to create more than 250 hours of instructional, enrichment, and staff development programming with unlimited taping and duplication rights.

Using their broadband capacity, local cable operators have expanded distance learning opportunities to include two-way audio and video, allowing students in remote locations to see and hear their teachers and originating teachers to see and hear all their students.

For example, Cox Cable Communications wired Clear View Elementary School in San Diego, California directly to its headend with fiber optics so fourth graders regularly access an electron microscope at San Diego State University, 26 miles away, as they study the scientific process in their science curriculum. While studying the 50th anniversary of V-E Day, second to sixth grade students joined fiber optically with Nebraska and Rhode Island students for a two hour video conference to share stories and information with students in Shevington, England. Teachers, student teachers, and master's degree students use the connection with San Diego State University for remote instruction.

TCI initiated a showcase school project in Carrollton City, Georgia where schools teach Spanish daily to all 1,700 elementary students with only two teachers. Each building has its own local area network; two dozen CD-ROM drives and 25 file servers provide interactive access in every classroom to all the instructional resources of the district and to administrative services. Stand alone multimedia workstations capture video network still images for student projects. Simultaneously, a separate cable video network links the district's classrooms.

After a year of planning and investing more than \$135,000, Continental Cablevision created a fiber optic system for Lincoln High School, Brookside Elementary School, and the San Joaquin County School Administrative offices to allow multipoint data transmission between science classrooms, the Library, Administrative Building, and Performing Arts Building, as well as traditional downstream data transmission. In addition, a local area network and wide area network were created to enable Internet connections to every classroom as well as an interactive video network.

A partnership between Time Warner and United Telephone Service of Ohio links disadvantaged school districts with those that can provide needed resources. A two-way video and audio optical fiber network links three high schools and a vocational school and is used for distance learning courses in creative writing, employability skills, and Spanish language. It is also used for video conferences among teachers, principals, superintendents, and boards of education, as well as for adult education programs.

Cable operators in several states are working together to build statewide, interactive fiber optic networks. For example, the goal of "Fiber-Span Pennsylvania" is to link existing satellite, microwave, coaxial, and fiber resources through a statewide fiber network in order to provide quality education to all schools. The project will eventually interconnect all the cable systems in the state.

Many cable companies have constructed Institutional Networks (I-NETs) that are discreet interactive broadband networks separate from the home subscriber's cable network. I-NETs usually serve schools, municipal offices (police and fire departments), and hospitals and are very effective in carrying point-to-point voice, data, and video signals. For example, in Continental Cablevision's New England region, more than 100 municipalities and 500 schools can use the I-NET free of charge for their video needs.

With free access to the I-NET provided by Continental Cablevision and TCI, six local high schools in the Chicago suburbs of Rolling Meadows, Buffalo Grove Village, and Elk Grove Village can hold face-to-face conversations with teachers and students 15 miles away. Purchasing similar multichannel transmission facilities from another source would easily exceed \$10,000 a month.

Cable makes multidimensional contributions to education through the efforts of cable operators to build distance learning networks, the products of program networks like The Discovery Channel and ME/U, which are exclusively dedicated to education, and industry-wide initiatives like Cable in the Classroom. Utilizing existing I-NETs, fiber optics, coaxial cable, satellite, and computer technologies, cable enables teachers to transcend classroom walls and allows isolated and economically disadvantaged students access to learning.

II. IXC's Contributions to Education

The interexchange carriers (IXCs), along with the regional Bell operating companies (RBOCs), cable companies, and others, are busy delivering the message that technology can improve the education process and reduce costs. For IXCs, the areas of distance learning, video conferencing, and the Internet receive particular emphasis.

The IXCs offer a vast array of NII-related products and services to the education community, for example, long distance and wireless service, telephone and advanced communications systems, audio and video teleconferencing, interactive community-based learning networks, and voice mail and advanced voice processing services. Ranging from a simple telephone in the classroom to something as complex as a full-motion interactive distance learning network, IXCs are bringing the power of technology and advanced communications solutions to the classroom.

IXC involvement in education is multifaceted and includes support for public policy initiatives, contributions of money, products,

and services and expertise, and sponsorships and exhibits. In addition to supporting a long term, strategic commitment to education, these activities provide benefits to the IXC in the form of brand recognition as well as through recognition for helping the community, advancing education, and being technology leaders.

The activities range from donations of hardware and software to the sale of products and services specifically designed for schools. A summary review of the IXC activities is perhaps the best way to illustrate the scope and depth of the IXC commitment to education.

AT&T

AT&T supports (\$150 million) education for business and philanthropic purposes. Realizing that no one organization can do it all, AT&T is focusing on four areas: teacher support, parental involvement, technology, and the fields of math, science, and engineering. In addition, AT&T recently announced it would provide three months of free Internet access to all schools in the United States.

A few illustrative examples of AT&T's involvement in education are listed below:

- The Telstar 4 family of satellites marked the beginning of a new era in "distance learning," including the virtual college as represented by the National Technological University (NTU) and the Satellite Educational Resources Consortium (SERC) for schools.
- In five major cities, the "Teachers for Tomorrow" program helps prepare new teachers for the unique challenges of inner-city schools.
- The "Teacher & Technology Institute" brings together outstanding math and science teachers from across the country to share in a two-week hands-on learning experience in using the latest technologies.
- A trial project in North Carolina links three rural schools via Integrated Services Digital Network (ISDN) technology to the interactive distance learning program at Appalachian State University.
- Substantial financial support is provided for a PBS program called *Mathline*, a satellite-based service which delivers instructional videos to schools.
- AT&T collaborated in the design of showcase Centers for Excellence in Education which offer the newest educational technologies for teachers to explore how innovative technology can improve the way teachers and students learn.

- Voice processing systems and homework hotlines are available to support parental involvement.
- The ImagiNation Network enables parents and students nationwide to work together on-line on homework assignments.

MCI

Examples of MCI's involvement in education include:

- Elementary school students in New Jersey take their first field trip to Australia using Internet technology.
- A demonstration distance learning project of the "classroom of the future" shows how school districts can share teachers, classrooms, and resources to improve education and cut costs.
- Grants are given to libraries to provide access to the Internet.
- MCI provides a new 155mb/s Very high-speed Backbone Network Service linking five supercomputer centers in the United States.
- MCI set up four "electronic classrooms" with full broadcast quality video conferencing equipment at an Arizona university;
- Middle school students get help with homework using a toll-free homework hotline staffed by teachers.
- Colorado University students are given an ID card with a picture on the front and a magnetic stripe on the back. In many ways this multipurpose card acts as a key to the university, i.e. access to campus facilities and events, paperless checking account, food services charge card, long distance calling card, etc.

SPRINT

A few examples of Sprint's educational activities include the following:

- A competition is sponsored among high schools which challenges students to solve a problem using advanced data communications tools.
- Eighteen schools in Tennessee use a fiber optic network to provide full-motion, real-time interactive television for distance learning instruction and collaboration among students and teachers. This network is also used off-hours by businesses for worker skill training and for health education seminars.
- A voice response system allows teachers to quickly and easily record messages telling parents of the day's events or homework assignments. In turn, parents can dial in and leave messages, eliminating the writing of notes and playing phone tag.

- Selected educational videos are available to eight California elementary schools equipped with "video jukebox" access to the Information Superhighway.
- Wide area networks allow students to link up with research centers and libraries across the country.

III. LEC's Contributions to Education

Similar to both cable and IXCs, local exchange carriers have actively supported educational efforts. A USTA survey that covered about half the LEC industry found that recent and near term planned expenditures on providing community and school sites access to the NII totaled hundreds of millions of dollars and covered over 40,000 sites. The range of these education efforts are illustrated by just a few selected examples from the four companies listed below.

AMERITECH

In Indiana, Ameritech is developing and connecting networks of video telecommunities capable of curriculum sharing, electronic field trips, collaborative learning, and school-to-business involvement. Ameritech has committed to invest up to \$120 million over the six year period from 1994 to 2000 for broadband infrastructure support. This investment will provide digital switching and transport facilities including, where appropriate, fiber optic facilities, to every interested school, hospital, and major government center in the company's service area on a non-discriminatory basis.

In addition to the infrastructure commitment, which could reach nearly 2,000 schools in Indiana, Ameritech is donating \$30 million over that same period to a non-profit organization, the Corporation for Educational Communications (CEC), for services and hardware for video distance learning. The CEC grants will provide classroom workstations and large screen monitors to approximately 550 middle schools, high schools, and universities throughout the state. All public, private, and parochial schools serving grades 7 through 12, located in Ameritech-Indiana service areas, and accredited by the State Department of Education are eligible for grants. Not only will CEC provide the extensive video distance learning hardware, but it is financially supporting the schools through usage and wiring grants, and the hiring of educational planners and trainers. Also, significant resources are invested in the development of cultural and educational interactive content for the video network to support the stated needs of the

education community. In its first year of operation, 40–50 different organizations have installed video distance learning service that can connect to almost 150 educational and cultural institutions within Indiana. Demand for service continues to grow quickly due to the CEC financial support and push for collaborative planning among different schools districts.

In Ohio, a similar commitment is underway. By the end of year 1999, Ameritech has committed to make available broadband services to all state chartered high schools, including vocational technical schools, colleges, and universities. This is over 550 locations. Additional commitments to libraries and government locations extend the capability to nearly 1,100 locations.

In Wisconsin, by the end of year 1998, Ameritech has committed to extend broadband facilities to the doorstep of every secondary and technical school, university, and college in the Ameritech service areas. With additional commitments to libraries and government centers, over 600 locations will be wired for broadband access.

An additional \$11.5 million matching funds grant for Michigan will provide customer premises equipment, servers, workstations, and library automation support. In a program labeled Education Avenue, Ameritech has offered to extend dial-up or dedicated Internet access to the first 500 schools who choose to use this service. Ameritech will provide equipment and routers, connections to an Internet provider, and will heavily discount the use of the service in its first year and a half of operation. A grant to Michigan State University will develop curriculum lesson plans utilizing Internet resources.

BELL ATLANTIC

World School, at West Virginia Public Schools. Bell Atlantic of West Virginia is providing public schools with the staff development, software, mid-level provider fees, and some network equipment to connect at high speed a minimum of five personal computers (PCs) per school to the Internet. To participate in this voluntary program, schools are responsible for acquiring their own PCs, arranging teacher development time, inside wiring, and providing either token ring or ethernet terminal adapters. Bell Atlantic provides robust software for each PC and the school router that allows Internet traffic to piggyback the West Virginia Electronic Information System (WVEIS) 56kb/s frame relay network used by school administration for student demographics, performance records, and guidance. The \$10 million project should be completed by the end of 1997. Of the 790 schools in the state, 650

already are using WVEIS. Bell Atlantic is providing training to teachers in about 25 schools each month. Already teachers have begun exciting curriculum projects over World School.

Basic Education Connection. In January 1994, Bell Atlantic made a commitment to connect every public elementary and secondary school to video dialtone and Internet when the neighborhood served by the school has access to the full service network. At Bell Atlantic shareowner expense, each school would be given access to educational programming available in the video dialtone environment. An estimated 10,400 public schools will benefit from this commitment.

Bell Atlantic and Union City Collaborate on Successful Multimedia Learning for Children. The highly successful multimedia learning environment developed in children's homes and the Christopher Columbus School in Union City, New Jersey, is widening and the improvement in test scores associated with the multimedia environment is strengthening. The turnaround in academic performance shown in Christopher Columbus school began after a crisis five years ago. At that time, Union City test scores, absenteeism, dropout rates, and other measures of school performance were so dismal that the state was threatening to take over the school system. The school system, parents, and teachers vowed to rescue the schools from that fate. Their innovative five-year plan included exactly the kind of boost in learning, improvements in teacher performance and attitude, and participation by parents that the partnership with Bell Atlantic has made possible.

Delaware: Distance Learning Takes Shape. Bell Atlantic of Delaware (BA-DE) and the State of Delaware are harnessing the statewide fiber optic network currently under construction to make better learning opportunities available to K-12 students and teachers. For the current school year, two school districts used two-way video distance learning technology for courses such as algebra, Spanish, and philosophy and for staff development programs. Following this success trial, a tariff for distance learning has been filed and more schools have asked to be linked. BA-DE successfully bid on connecting all public schools to the Internet, which will be done quickly using Switched Multi-Megabit Digital Service (SMDS). Based on educational market enthusiasm and feedback, BA-DE is also working on the business case to create a market trial of networked multimedia applications. Networked multimedia was the technical cornerstone for the highly successful results in Union City, New Jersey. As in Union City, BA-DE works collaboratively with teachers, school boards, and

other public officials toward the best learning opportunities. Children seem to benefit greatly from good technology and public-private collaboration.

BELLSOUTH

Using BellSouth facilities, Palm Beach County, Florida deploys commercial quality broadcast signals that currently reach eight high schools, one community college, and two administrative centers for distance learning applications.

Charlotte's Web is a comprehensive infrastructure and network of services in the Charlotte-Gastonia, North Carolina and Rock Hill, South Carolina area to provide citizens and school children with free access to information and educational resources. Corporate partners include BellSouth, Time Warner Cable, and Vision Cable. Charlotte's Web provides informational, educational, and communications services including medical help and referral services, on-line library services, and distance learning.

In its efforts to bring modern communications technologies into the classroom, BellSouth Mobility has introduced ClassLink™, a mini-cellular system to provide students access to educational and cultural resources. The system also allows teachers to communicate with colleagues outside the classroom, improving the productivity of teachers and staff. The system is especially appropriate for rural schools or in facilities that cannot be retrofitted for modern technology.

NYNEX

NY Net/The Living Textbook (a collaborative trial between Syracuse University and NYNEX). An ATM network links Syracuse University, Cornell University, Rome Labs, Columbia University, and several other higher education sites. Syracuse University and other schools are working together to better understand how multimedia technology can be integrated into the classroom curriculum. The Living Textbook is a trial of multimedia software over the Asynchronous Transfer mode (ATM) network in the K-12 segment; the project links the Ralph Bunche School in Harlem, Fowler High School in Syracuse, Rome Free Academy in Rome, and Whitesboro Middle School near Utica to the Internet, the computers of Syracuse University's Northeast Parallel Architectures Center (NPAC), and research facilities at the U.S. Air Force Rome Laboratory. The students at the various schools can see and talk to each other, while simultaneously working on the same project.

NYClassNet. NYClassNet is a digital two-way audio and video distance learning network that connects four New York City high schools, Manhattan Community College, and Lincoln Center to deliver college courses, share teaching resources, and host cultural events.

Project Tell. Project Tell was a three-year, \$3 million project that focused on assessing the impact of telecommunications technology on children considered to be "at risk." Three initiatives were introduced into nine schools in New York City. PCs in the classroom, PCs in student homes, and parent-teacher communication via voice messaging. City University of New York (CUNY), which was hired to evaluate the effect on the children involved, reported positive results, including decreased dropout rates. The project concluded in 1993.

Bunker Hill Community College. A six-site, multichannel analog video network links the college and the Massachusetts Consortium for Education and Technology (MCET) with several Boston high schools. Classes are taught via distance learning from college to local high schools and to classes in other parts of the country.

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NYNEX EDUCATION PLAN

Under the NYNEX Education Plan (“NEP”), the Commission and Joint Board would refrain from attempting to identify the specific services required by a school in order to bring information technology into the classroom. Rather, the Commission, working with both the Joint Board and the Education Telecommunications Council recommended by the Aspen Institute Report, would establish an “educational vision” that would describe the nationwide goal for connecting schools to the information superhighway. Using this vision, the Commission would then establish a Benchmark Price to implement it, and both the Commission and The Joint Board would define a Benchmark Discount that would form the basis of the educational funding required of the Federal Universal Service Fund (“USF”) as mandated by the Act.

Schools would be provided with the flexibility to determine how best to accomplish the educational vision given the unique characteristics of their students, their infrastructure, their personnel and the other sources of funding for information technology. A State Authority would be given the responsibility to certify the proposals put forward by individual schools or school districts as being consistent with the educational vision. This State Authority would be given the flexibility to vary the Benchmark Discount within Commission prescribed ranges in order to meet the funding needs of individual schools.

The NEP proposes that the Commission adopt as its educational vision the “partial classroom model” contained in the Kickstart Initiative. This model would connect half the classrooms in America over the next five years at a reasonable cost. The costs of accomplishing this objective were identified by McKinsey and Company to be:

<u>Element</u>	<u>\$ Millions</u> <u>Initial</u>	<u>Ongoing</u>
Connection to School	\$ 1,715	\$ 1,030
Connection within School	\$ 5,025	\$ 410
Hardware	\$13,740	\$ 1,130
Content	\$ 3,505	\$ 1,715
Professional Development	\$ 3,665	\$ 2,435
System Operation	\$ 1,220	\$ 810
TOTAL	\$28,870	\$ 7,530

The telecommunications related cost (connection to and within the school) are \$6.74 billion for the initial deployment and \$1.44 billion for ongoing maintenance and usage. These values would have to be verified for reasonableness and, if found accurate, would be used to establish a Benchmark Price per student to achieve this educational goal. The Benchmark Price would be applied to a Benchmark Discount to determine the total level of Universal Service funding.

To evaluate the reasonableness of this plan, the USF was calculated assuming that the Benchmark Discount for initial costs would be set at 75% for initial costs and at 50% for ongoing costs. This would result in the following USF requirements, assuming the NEP was introduced in 1997 and phased in at a rate of 25%, 25%, 20%, 15% and 15%.

\$ Millions

<u>Year</u>	<u>Initial Costs</u>	<u>Ongoing Costs</u>	<u>Total</u>
1997	\$1,265	\$180	\$1,445
1998	\$1,265	\$360	\$1,625
1999	\$1,010	\$505	\$1,515
2000	\$ 760	\$610	\$1,370
2001	\$ 760	\$720	\$1,480

After the initial five year period, ongoing funding would be at a level of \$720 million, assuming no other changes were recommended in the NEP.

This level of funding would be converted to a per-pupil dollar amount. This would represent the Benchmark level of funding at the Benchmark Discount level within each state. A State Authority would be designated to certify the individual proposals prepared by schools or school districts. These proposals would describe the schools' plans to bring telecommunications technology into their classrooms. The State Authority would certify that the school had a proposal that would implement the educational vision as outlined by the Commission.

The intention of the NEP is to provide both the individual schools and the State Authority the maximum flexibility in accomplishing their respective tasks. The State Authority would have the ability to vary the individual discount provided to a school if that were required to implement the educational vision. However the average discount would still have to equal the Benchmark Discount established by the Commission and Joint Board. The Commission would establish ranges within which the State Authority could operate. These ranges could be 25% - 100% for initial costs and 20% - 90% for ongoing costs.

After the school's proposals were certified and the discounts were established, the school would submit the certification form to the USF Administrator. The USF Administrator would establish an account for the school and credit the account with a number of Telecommunication Credits reflective of the authorized discount and the number of pupils enrolled in the school.

After notification by the USF Administrator, the school could seek to establish the best market price it could for the telecommunications services that it needed to purchase. This could be accomplished in any manner the school wishes to pursue and by dealing with any telecommunications carrier or carriers. When purchasing services, the school would inform the carrier of the number of telecommunications credits that could be applied, along with the school's account number. The carrier would seek reimbursement from the USF Administrator for the Telecommunications Credits, and bill the school for the remainder.

CERTIFICATE OF SERVICE

I hereby certify that copies of this pleading were mailed this date, first class postage prepaid, upon the persons listed on the attached service list.



Joseph Di Bella

Dated: April 12, 1996

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