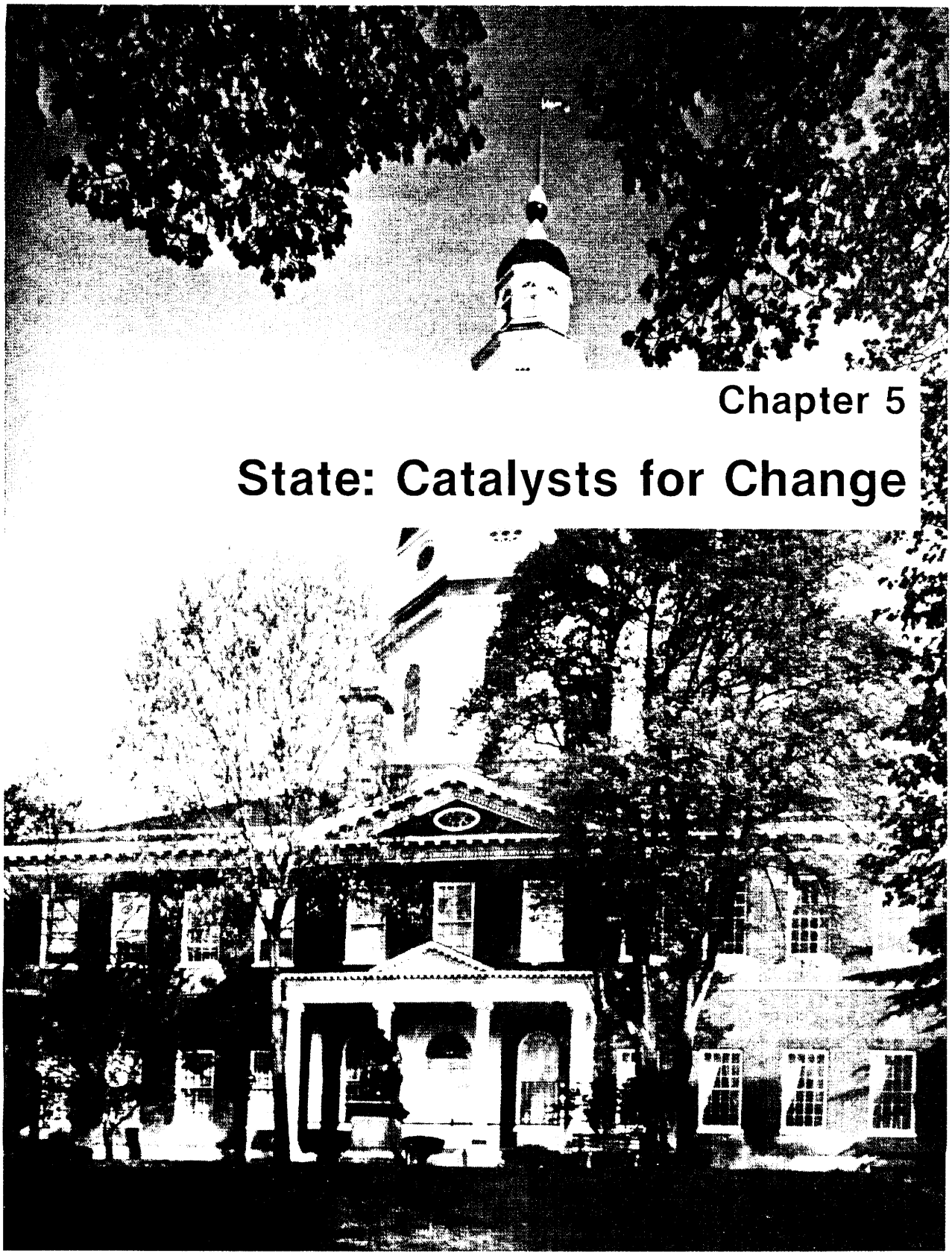

Chapter 5

State: Catalysts for Change

Photo credit: State of Maryland

State House, Maryland

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States: Catalysts for Change

INTRODUCTION

States have become major players in planning, supporting, and organizing distance learning activities. This reflects the general increase in State activity in education as well as other public services, such as health, transportation, social welfare, and telecommunications. Expanded State authority over the last decade reflects both the reduced Federal role in these areas and the growing sophistication of State governments.

There are three underlying reasons why States are increasingly shaping and regulating distance learning. First, since responsibility for public education rests principally at the State level, it is only natural for States to shape distance learning policies. Second, as deregulation of telecommunications has occurred at the Federal level, many policy and regulatory issues in telecommunications have shifted to the States.[1] Finally. as critical decisions made at the local level affect future telecommunications services and facilities, some States have recognized that a statewide focus could improve the coordination and efficiency with which resources meet educational needs.

FINDINGS

- **State-mandated curriculum changes and increased requirements for graduation are driving distance learning developments. A similar push has come from new course and distribution requirements for admission to State university systems. Increased standards have forced schools to find ways to offer a more extensive and intensive curriculum.**
- Small and rural districts unable to meet the standards fixed by States have traditionally been forced to consolidate. Today technology provides an alternative. **The future of small and rural school districts may therefore be intimately tied to the availability of appropriate and affordable distance learning technologies.**
- Telecommunications systems initially targeted at isolated rural schools are now bringing needed resources into urban and suburban schools as well. Traditional classroom courses are being enhanced through the infusion of resources and new curriculum modules. Students at all learning levels and of varying skills can profit from the varied opportunities. States expect the systems to upgrade the teacher work force through inservice, professional development and networking. **As these new opportunities appear, competition for services will force States to carefully consider the equitable deployment of telecommunications resources.**
- State educational policies and telecommunications regulations are shaping the development of distance learning. Yet present State policies may **be outmoded and block the opportunities that advancing technologies offer for creating new classroom boundaries and new telecommunications services.**
- Educational policy conflicts center on traditional approaches to teacher certification, course credit, curriculum materials, and instructional logistics. **Little attention has been paid to how distance learningcan meet broader school reform goals, such as restructuring education and using technologies as tools for change.**
- Many States look to telecommunications as a way to stimulate economic growth. **Where the education community has taken the lead in these planning efforts, it has had the unusual opportunity to be in the forefront of technological innovation and, through early involvement, to ensure that its needs are recognized and included in statewide telecommunications plans.**
- Although States have rarely worked together to solve common educational problems in the past, **distance learning provides economies of scale that encourage multistate use.** When new boundaries are created, educational and telecommunications issues will need to be resolved between the States.

I see Lynne Gallagher and Dale Hatfield, *Distance Learning Opportunities* in *Telecommunications Policy* and Technology (Washington, DC: The Annenberg Washington Program of Northwestern University, May 1989).

Photo credit: OTA staff

Many States have increased course requirements for high school graduation.

- Most State plans involve creative partnerships with the private sector that offer opportunities to provide resources for education. **As school districts band together as consumers for distance learning services, they become an attractive market for telecommunications providers. This is a unique opportunity for schools, and one that should be pursued actively.**

EDUCATIONAL REFORM: SETTING THE SCENE FOR DISTANCE LEARNING

The growing State interest in and support for distance learning parallels increased State involvement in educational reform. States have been driven by issues of equity, by economics, and by the pullback of Federal responsibility. States are taking many steps to meet school improvement goals. As noted by the National Governors' Association (NGA):

> States increased their financial support for public elementary and secondary education by $27 billion or 56 percent between 1980 and 1986. They set graduation **standards** for students and created major aid programs to help students meet those standards. They recruited more qualified teachers through higher salaries, better training, and demanding entry standards. They monitor the performance of school districts, and require corrective action when it is needed.[2]

Concern for the quality of public education follows the growing competition among States to maintain their existing industrial base as well as attract new development and industry. School quality is a key factor in attracting business. Companies require an educated work force as well as good schools for the children of their employees. Recognizing that good schools are essential to their State's economic vitality, legislators have focused on how students statewide measure against students nationwide, and how student achievement varies across districts. One response has been to set higher goals for all students, by raising requirements for high school graduation and for entry into State university systems. As a result, foreign language and higher level mathematics and science courses, once optional, now must be offered if schools are to provide equal educational opportunities for all students. Schools have to find ways to teach these courses or be shut down.

Many States are turning to distance learning as a resource for improvement. In their annual report on education reform, NGA notes: "By far the most prominent area of State involvement in 1987-88 was distance learning or telecommunications."4 Fewer than 10 States reported any involvement in telecommunications in the NGA 1987 survey. In the 1989

[2]National Governors' Association, *National Governors' Association Policy Positions 1988-89* (Washington, DC: 1989), p. 51.

[3]In 1983, the National Commission on Excellence in Education recommended that high school students take more courses in the "New Basics"—4 years of English, 3 years of mathematics, 3 years of science, 3 years of social studies, and 1/2 year of computer science. In addition, 2 years of a foreign language was strongly recommended for college-bound students. Forty-two States responded by raising coursework standards for high school graduation. Margaret E. Goertz, State *Educational Standards in the* 50 *States: An Update* (Princeton, NJ: Educational Testing Service, March 1988), p. 5.

[4]National Governors' Association, *Results in Education: 1988* (Washington DC: 1988), p. 29.

survey, 37 States reported distance learning initiatives and expansions of efforts already begun.[5] See appendix A for examples of State planning.

STATE PLANNING FOR EDUCATIONAL TELECOMMUNICATIONS NETWORKS

Education and telecommunications have both been the focus of State policymaking in the past; what is new is the convergence of these two State issues. This convergence has important implications for both fields separately and for the emerging hybrid of educational telecommunications policy.

Traditionally, there has been no one administrative or planning body looking at State educational telecommunications as a whole. State Education Agencies (SEAS) assumed responsibility for planning and financing the educational infrastructure, for conducting needs assessments, and for setting statewide educational standards that affect local school districts. State telecommunications policy most commonly is derived from input from a combination of authorities. In this broader arena, distance learning planning may come under the auspices of other State agencies, not just the SEAS. Educational telecommunications policy may emanate from the State telecommunications agency, the public television organization, the university system, the State Department of Education, or a special task force set up by the Governor or legislature. Texas, Hawaii, and Oregon present a range of examples of State planning for distance learning. Each planning process was unique, yet the overall goals and recommendations are quite similar.

In Texas, the impetus for change came from a legislative mandate to the State Board of Education to meet the requirements of the 1987 *Long-Range Plan of the State Board of Education for Public School Education.* One of the reports presented to the legislature, with recommendations for funding, was the *Long-Range Plan for Technology, 1988-2000.* Distance learning is one of four priority areas, along with classroom instruction, instructional management, and communications, outlined for meeting the goals for educational reform. In this context, distance learning is viewed as a vehicle for improving education. The plan focuses on today's classrooms and the changes needed to prepare an educated work force for the 21st century. State action is called for in meeting K-12 goals related to curriculum, attracting and retaining qualified and effective teachers, and improving instruction through innovation. The plan recommends that the State:

- . . . investigate, provide assistance for, and encourage implementation of distance learning technologies in order to provide a well-balanced curriculum to all students;
- . . . investigate, provide assistance for, and encourage implementation of distance learning technologies to overcome the absence of qualified teachers in sparsely populated areas;
- . . . coordinate public and private telecommunications systems for delivery of distance instruction and administrative services.[6]

In Hawaii, the State legislature appropriated $590,104 over 2 years (fiscal years 1987-88 and 1988-89) for the development of a Distance Learning Technology Plan.[7] The plan was prepared through a unique cooperative endeavor involving the Department of Labor and Industrial Relations, the Department of Education, and the University of Hawaii. These agencies worked together because of their common concerns for education in serving statewide employment priorities that " . . . will move Hawaii into a preferred future of the 21st century."[8]

> Successful education and training programs are not single-agency endeavors—they necessarily involve educational institutions with community partners, including business and government sectors. Cooperative problem identification, planning and implementation have produced training programs which optimize the use of limited resources, offer both short- and long-term solutions, and promote continued sharing of resources.[9]

In 1987, the Oregon legislature established an Ed-Net Committee, with nine members appointed

[5] Ibid., p, 31; and National Governors' Association, *Results in Education: 1989* (Washington, DC: 1989), p. 31.

[6] Texas State Board of Education, 1988-2000 *Long-Range Plan for Technology* (Austin, TX: December 1988), p. 17.

[7] Hawaii State Department of Labor and Industrial Relations, Distance *Learning—Technology Plan* (Honolulu, HI: August *1988).*

[8] Ibid., p. i.

[9] Ibid.

by the Governor, to examine the prospect of a statewide telecommunications system. The ED-Net concept was initiated in 1985 when the American Electronics Association created a planning committee involving representatives from education, business, and Oregon Public Broadcasting. Ed-Net was originally envisioned as a television system that would make college and university courses available in all parts of the State, but the concept created under the plan[10] has a much broader focus, scope, and range of technologies:

> Ed-Net can be a powerful tool for economic development, and simultaneously it will be a cost-effective way to broaden access to higher education, improve the delivery of instructional materials to schools, strengthen library services, and make governmental agencies and social service organizations better able to conduct their important training, education and information functions.11

Whatever the motivating force, the resulting State agency or newly formed organization is empowered to assemble and coordinate the various telecommunications users within a State to plan for ways to meet common goals and needs.[12] This coordination can be "horizontal," when accommodating a range of State agencies that share telecommunications needs despite varying responsibilities and audiences (e.g., Departments of Corrections, Health and Human Services, Public Works and Transportation, Labor, and Education). Coordination can also be "vertical" between levels of a particular agency. Of special interest in the education **sector are linkages among the providers of educational services across the elementary, secondary, university, and continuing education spectrum. A common sense of purpose fostered by planning for shared telecommunications needs can lead to new constructive dialogs and relationships among agencies responsible for education, creating a bond that unifies these typically independent communities.**

In several States, the educational institutions have been in the forefront in statewide telecommunications planning. Iowa and Maine provide two examples. Both States were looking for ways to provide educational services equitably to their constituents dispersed across great distances. Iowa had a system of community colleges and some experience in reaching out to learners via telecommunications. Planning centered on meeting educational needs, coordinating resources, and avoiding costly duplication of services. The Iowa network will assure that all parts of the State receive equal attention. (See figure 5-1 and chapter 1, box 1 -D.) Maine was in a different position, using distance learning technologies to provide a community college system for the State. (See box 5-A.) Connecticut provides a third example. (See box 5-B.)

THE STATE EDUCATION AGENCY

State Education Agencies can play a major role in distance learning because of their responsibility to assure that all school age children in the State are provided equal educational opportunities, regardless of school size or location. An SEA typically determines State funding distribution, sets statewide curriculum standards and graduation requirements, regulates teacher certification and recertification policies, and provides technical assistance to local districts. State leadership can be a strong force in articulating educational goals and illustrating how solutions like the use of distance learning technologies can help address them.

There are, however, likely to be circumstances where the State view and the local view will diverge, especially in the area of providing service to small rural schools. [13] Since State education authorities are generally charged by law with oversight of the educational enterprise, they must consider basic questions of adequacy, efficiency, and equity of the entire State system. The local community may have a strong bias toward preserving the small, often isolated rural school at all costs, as a key to the continuing life of the community. When local

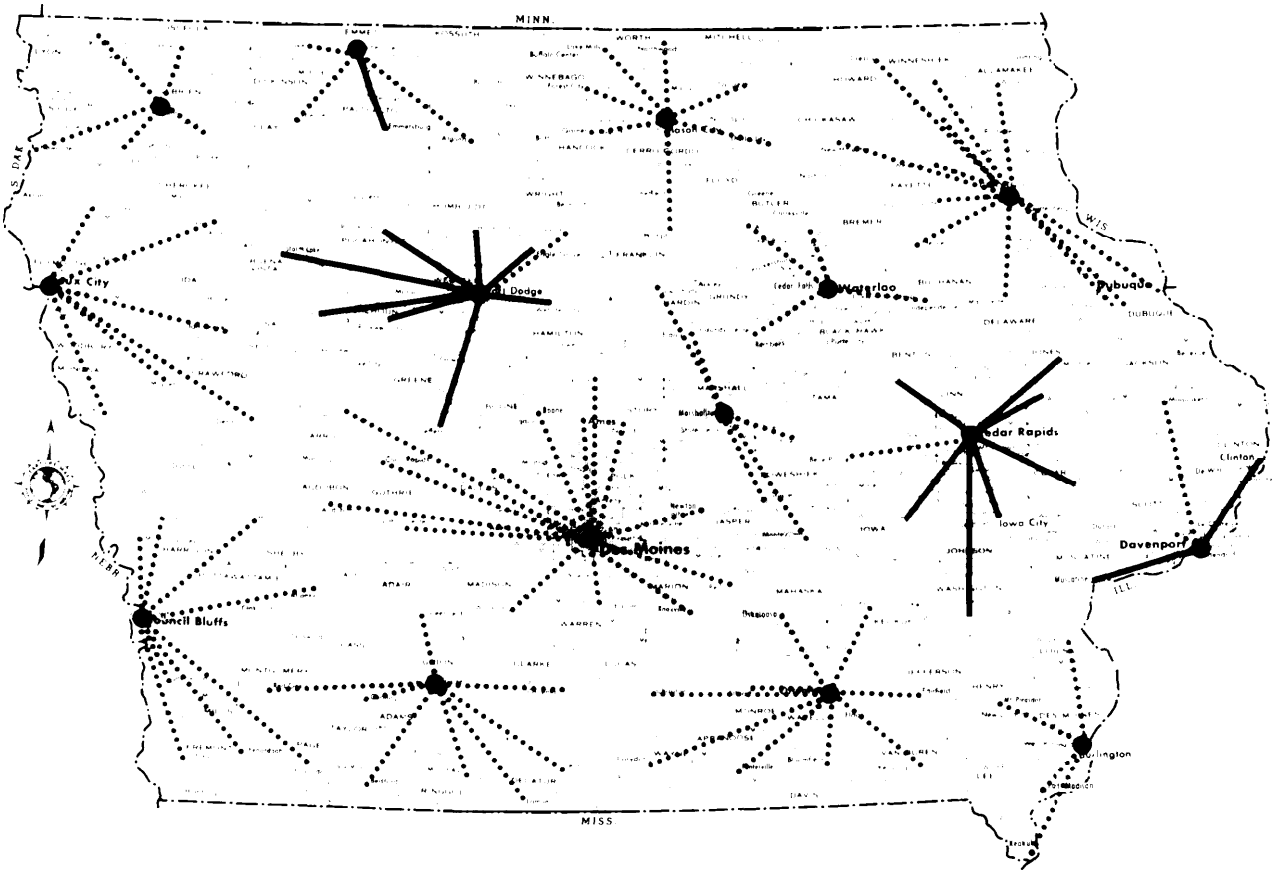
[10] Oregon E&Net Committee, *Oregon Ed-Net: A Report on the Feasibility of a Statewide Telecommunications Network* (Salem, OR: July 1988).

[11] Ibid., p. 1-1.

[12] In Washington State, planning efforts by the Office of Public Instruction, the Higher Education Coordinating Bored, and the Department of Community Development came together when the three groups found areas of common ground. The resulting proposal outlined a system where telecommunications resources and services could be shared at considerable savings to taxpayers. See Washington State Office of the Superintendent of Public Instruction et al., *Proposal for Sharing Video Telecommunications Resources* (Olympia, WA: January 1989).

[13] Kenneth H. Hansen, *Distance Education and the Small School: Policy Issues* (Portland, OR: Northwest Center for State Educational Policy Studies, Northwest Regionat Educational Laboratory, August 1987), p. 3.

Figure 5-1-Iowa Educational Telecommunications Network



Communities all across Iowa will be connected to the network through numerous Instructional Television Fixed Service (ITFS) links.
SOURCE" Iowa Public Television.

interests and State interests conflict, new solutions such as distance learning technologies may provide a partial solution. (See box 5-C.)

Organization and Management of Distance Learning in State Education Agencies

Management of distance learning within SEAS varies.[14] Distance education, in contrast to computer education, has yet to find its niche in SEAS, Over the last few years almost all the States have created an educational technology division or director within their SEA.[15] In most cases, these technology directors or offices have been responsible for developing policies and support for procedures for computer hardware and software purchases, software evaluation, technical assistance, curriculum development, and teacher training in computer use. They are not necessarily charged with planning or administering distance learning efforts in their States.

[14]Much of this discussion comes from Donald C. Holznagel and Thomas Olson, Northwest Regional Educational Laboratory, "A Study of Distance Education Policies in State Education Agencies," OTA contractor report, February 1989.

[15]In the 1988 OTA survey of the States, 41 States had a technology division or staff position for educational technology, *24* had a long-range plan for educational technology, and 13 others had plans under development. U.S. Congress, Office of Technology Assessment, *Power On! New Tools for Teaching and burning, OTA-SET-379* (Washington, DC: U.S. Government Printing Office, September 1988).

Box S-A—Maine's Telecommunications Network: A Community College for the State[i]

Planning for a statewide telecommunications system in Maine was driven by a clear need to improve overall **educational** opportunities in the State. The statistics are stark: approximately one-quarter of Maine adults are fictionally illiterate, 37.5 percent have not earned a G.E.D. or high school diploma, and real earned income of workers places them 49th in the Nation. The State ranks last in adults participating in higher education and 48th in high school students seeking postsecondary education.

These statistics reflect a collection of problems that currently serve as barriers to education. Perhaps the greatest barrier is Maine's size (the State is as large as the other five New England States combined) and dispersed population, a combination that has made access to educational services difficult. Today two-thirds of the population live beyond a reasonable commuting distance of one of the State's seven university campuses or one of the six postsecondary vocational-technical institutes. Severe weather, predominantly secondary roads, and limited public transportation systems compound the problems of geographic isolation. In addition to these geographic obstacles, a shortage of faculty at both the high school and postsecondary level, combined with increasing costs of instruction, create additional educational problems, especially in the State's rural areas. At the same time, the State found itself facing demands to increase the breadth and depth of curriculum available to all students at the high school and postsecondary level.

The University of Maine system has been a key player in seeking solutions to these statewide educational challenges. Recognizing the declining number of students who typically make up the pool from which university students are drawn-the 18 to 22 year-old just leaving high school—the university looked for a way to reach a broader spectrum of learners. University leaders were convinced that the State had to find a way for older, part-time, and commuter students to access educational programs. Nationally, approximately 40 percent of all students enrolled in higher education are served in community colleges, but Maine had no community college system,

As a result of a 2-year planning process, involving the faculty and staff of each of the seven campuses in the university system, the six vocational-technical institutes, and the public schools, a Plan for a Community College of Maine/Telecommunications System was adopted. This plan calls for the development of a telecommunications delivery system allowing the transmission of "live" classes by linking existing campuses of the university, the vocational-technical institutes, the Maine Maritime Academy, numerous off-campus centers, and all the public high schools in the State. The plan also calls for 50 locations to be on-line by September 1989, the first year of operation of the statewide system. In effect, telecommunications will create the community college system for the State.

The technical specifications call for a fiberoptic spine (a high-speed electronic highway) linking the campuses, each of which will be transmission sites. Several of the off-campus centers will also have transmission capability when the system is complete. The fiber optic spine will carry three channels of full duplex (two-way) video, audio, and data, while an Instructional Television Fixed Service microwave system will extend beyond the spine and carry two channels of video, audio, and data, with audio return. The University of Maine at Augusta (UMA) will serve as both the hub of the terrestrial system and the site for satellite linkages. Dishes on all high schools, State and local **government** buildings, hospitals, and businesses, and cable television systems will make live programming available to users across the State. Course materials, examinations, syllabi, and data can be distributed electronically y (using facsimile machines and computers) or by mail between sites. Funding for the system has come from Federal **Higher Education Act Title 111 grants and from a $2.2 million appropriation from the State legislature.**

In the first year **of** operation, programming will include a statewide offering of UMA's Associate Degree in General Studies. Twenty-six courses will be broadcast each semester of the 1989-90 school year. Five additional graduate-level courses will be broadcast by the university. Nine courses and workshops will be offered over the instructional television system by the vocational-technical institutes, and high schools and the Department of Educational and Cultural Services have been allocated 5 hours per day on the system. Inservice training for teachers is expected to be **a** major use for the system. In all, the system will broadcast live courses over two channels from 7 a.m. to 10 p.m. Monday through Friday, and from 8 a.m. to 4 p.m. on Saturday.

Maine illustrates how a State can, with coordinated planning, use a telecommunications system as a means to address a range of problems.

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[i]Much of this discussion comes from George P. Connick and Pamela MacBrayne, University of Maine-Augusta, "Educational Access and Telecommunications in Maine," unpublished manuscript, April 1988.

Box 5-B-Piecing Together Educational Teleconamunications: The Connecticut Approach[1]

Although Connecticut has **not** adopted **a formal State** plan for educational telecommunications, it has developed a multifaceted approach to providing education over a distance. The components of the system are designed to operate independently, but, since they serve convergent needs, they may interconnect when completed. The backbone of the system is StateNet, a fiber optic and copper cable network. This system will serve all State government agencies, predominantly for data and voice transmission. Immediate plans do not call for educational use; however, once the telecommunications needs of government and education are more clearly defined, StateNet may carry education traffic,

The second facet is an Instructional Television Fixed Service (ITFS) network that will allow schools and businesses all over the State to access courses and enrichment materials from many providers, including the State's community colleges, which already have their own small ITFS network. The State Department of Education is charged with building and operating the K-12 ITFS system. The system will provide instructional television, distance delivery of courses, professional development, teleconferences, and materials distribution among schools. The first phase of this system, serving 25 school districts, became operational September 1989. The complete system serving all school districts is projected for 1991.

A Telecommunications Incentive Grant Program, authorized by the Connecticut General Assembly in 1986, provides funding to local districts and regional education agencies for planning, operating, and expanding the use of telecommunications in education. Most of these grants are small (none has exceeded $23,000), in keeping with State goals to promote a variety of approaches and to encourage the commitment of local districts. Grants awarded so far total $252,000, approximately $85,000 per year. As **a** result of interest generated by the Telecommunications Incentive Grant Program, the State Department of Education is also cooperating with Southern New England Telephone (SNET) to explore how schools could better apply telecommunications services to education. SNET funded the pilot program, at a cost of approximately $1.5 million. Three types of "links" operate at different sites throughout the State. The "voice link" uses a voice message system to promote links between parents and teachers. The "data link" gives students and teachers access to remote databases through personal computers in the school library. The "video link" connects sites with an interactive two-way video system. One of these video links connects an Advanced Placement Spanish language high school class in suburban West Hartford with an advanced class of native Spanish speakers in Hartford's inner city. A future video link will provide engineering classes, taught by professors from the University of Connecticut to high schools via the system. The College of Education at the University of Hartford also has indicated interest in joining the project to expand classroom observation and student teaching experiences. SNET plans to continue funding for an additional year in order to evaluate how the technology is being used in the pilot projects, and the State will fund 10 additional data link sites,

[1]@'A site visit, February 1989.

Even in those States where the State education department has developed a plan for distance learning, there may be the mistaken assumption that distance education technologies can be treated in the same manner as computer technology in the planning process, ignoring the unique impacts of distance education on areas such as teacher certification, curriculum approval, and funding formulas, And, while most States involved in planning are taking an active role, the tone, format, and level of involvement varies. Some States see their role as a "bully pulpit" to encourage local activity, while others provide direct support for local demonstration projects. Some States only go so far as to disseminate information and technical assistance, while others are more assertive in the setting of standards and development of materials.

In the OTA analysis of State policies,[16] 21 States were studied for their policies regarding distance learning. Legislative mandates, policy documents, technology plans, distance education plans, and telecommunications plans were reviewed as possible sources for State policies on distance education. Only 7 of the 21 States sampled have policy documents specific to distance learning. Another survey, taken by the Council of Chief State School Officers in February 1989,[17] had similar findings. Judging from the sample of States surveyed, most

[16]Holznagel and Olson, **op. cit.,** footnote 14

[17]Council of Chief State School Officers, "State Survey on Distance Education Networks." unpublished document, February 1989

Box 5-C--Benefis of Preserving Small Schools

Education is an intimate process.[1]

One benefit of distance learning technology is its potential for allowing small, undeserved schools and school districts to remain active despite waning student populations and a shortage of critical resources. According to the U.S. Department of Education, approximately 75 percent of the 15,579 school districts in the United States can be classified as small (less than 2,500 students).[2] These districts enroll slightly over 20 percent of the Nation's student population, Additionally, over one-half of the school districts in the United States can be classified as both small and rural.[3] These districts are often geographically isolated, and suffer from a lack of funds, a shortage of qualified teachers, a minimum of resources, and limited course offerings-especially advanced courses. In Texas, for example, small school districts offer, in general, only about one-third the number of courses offered by larger districts, while rural districts offer only about one-quarter as many courses as do their major urban counterparts.[4] Through distance learning, however, small and rural districts can provide some of these previously unavailable courses, giving their students educational opportunities similar to those offered students in larger urban and suburban disitricts.

For many years, the most viable option available to school administrators faced with the limited curricular offerings in small schools was to consolidate schools and school districts. Some education experts, however, have begun to challenge the belief that "bigger is better." For example, recent studies have demonstrated that small schools and school districts often promote high levels of student achievement. A study of New Jersey school districts concluded that in". . . all cases, larger district enrollments are associated with lower test scores."[5] Even when the socioeconomic status and expenditure levels of each district were taken into account, the conclusion *was* the same: the larger districts in the study were generally less efficient in attaining achievement. Other studies of individual schools have resulted in similar conclusions. A 1975 survey of Colorado schools determined that ". . . large school size lowered achievement levels.'[6]

Research also shows that smaller school districts are generally as cost efficient as their larger counterparts. The New Jersey study found that although very small districts (those with fewer than 300 students) spend more per student than larger districts, the ".. . per student costs of districts with 500 to 5,000 students and over . . . differ

[1] Jane Russo, "College Comes to *North* Haven," *Community College of Maine Newsletter, prepared by the* University Of Maine, Augusta, Office of Distance Education, vol. 1, No. 3, August 1989, p. 1.

[2] U.S. Department of Education, National Center for Education Statistics, "Public Elementary/Secondary Education Agency Universe Survey, 1987 -88," unpublished document, 1989.

[3] Bob Cole, "Teaching in a Time Machine: The 'Make-Do' Mentality *in* Small-Town Schools," *Phi Delta Kappan*, October 1988, pp. 139-144.

[4] In Texas school districts with 50,000" or more students, the average number of courses offered in 1985-86 and 1986-87 was 209; in districts with 1,000 to 1,599 students, the average number of courses offered was 76. For those school districts with fewer than 500 students, this figure was 54 courses. When analyzing district type, major urban districts in Texas offered on average 200 courses, while rural district offerings averaged 56. Texas Education Agency, 1988-2000 Long-Range *Plan for Technology* (Austin, TX: December 1988), p. 26

[5] Herbert J. Walberg and William J. Fowler, Jr., *Expenditure and Size Efficiencies of Public School Districts* (Chicago, IL: Heartland Institute, September 1988), p. 17.

[6] Kenneth F. Palmer, "Small Is Beautiful: Schools As If Kids Mattered," *The Clearing House*, vol. 51, No. 9, May 1978, p. 437.

States have yet to spell out specific policies that guide distance learning. In most cases existing State policies become, de facto, the basis for distance learning policy in the State. This is particularly true in States where distance learning projects are locally based and do not involve importing courses from out-of-State. Where multistate courses are brought in by satellite, however, some States have felt more pressure to develop policies addressing issues such as what is required of teachers and what curriculum and texts can be used,

In both the telecommunications and the educational arenas there is a tension between the State's role as regulator and as empowerer. In the education policy arena, States have traditionally served as regulators to assure that quality standards are met in all schools across the State and that all children are equally well served by the public education system. Consequently, educational policies tend to be restrictive, focusing on minimum standards of traditional instruction. While important, these policies tend to maintain the status quo.

very little."[7] Additionally, since the New Jersey study had previously determined that smaller districts generally produce higher standardized test results, it has been suggested that smaller districts actually attain " . . . more achievement value per dollar. . . " than do larger districts.[8]

Student participation—both in the classroom and in extracurricular activities-was also found to be higher in smaller schools. Small class size, close teacher-pupil relationships, and more personal attention all result in higher levels of student participation in the classroom. Students at smaller schools typically participate in more extracurricular activities as well. Although larger schools are able to provide a greater number of activities, research has shown that". . . students from small schools participated in a wider variety of extracurricular activities than did students from large schools, and a much larger portion of students from small schools held important and responsible positions . . . than did students from large schools."[9]

Clearly, the challenges faced by teachers in small, rural schools are substantial, Often, they must contend with a lack of resources, little technical assistance, geographic isolation, and low pay. Nonetheless, small schools can offer numerous advantages to their staff that large schools cannot. For instance, teachers clearly prefer smaller classes and increased personal contact with students that small schools offer. Less tangible advantages, such as a heightened sense of efficacy, existence of a functional support system, and a stronger identification with the school, are more prevalent in smaller schools as well.[10] These factors all contribute positively to the way in which teachers identify with their school. Finally, smaller schools have generally demonstrated a more desirable social climate than larger ones. Due to their isolation, as well as the small population served, many smaller schools create a heightened sense of community as well as" . . . the special feeling that each student matters."[11] As a result, smaller schools do not experience as many behavior problems. Studies have shown that the" . . . relative incidence of student truancies, teacher assaults, vandalism, intra-student fighting, school expulsions and dropouts . . . increase as student population density increases."[12] Additionally, attendance and student satisfaction levels are generally higher at smaller schools.[13] It appears, then, that the "community" environment of small schools creates a nurturing atmosphere for both teachers and students.

Small, rural schools face special problems that affect their ability to remain competitive in the educational marketplace. However, the numerous positive attributes of smallness argue for their preservation. In order to compete effectively, small schools must be provided with the same resources and advantages as their larger counterparts. Distance learning can provide at least a partial solution to this dilemma, by helping to keep small schools and school districts open in the face of consolidation.

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[7] Walberg and Fowler, op. cit., footnote 5, P. 6.

[8] Ibid., p. 17.

[9] Roger G. Barker and Paul V. Gump, Big *School, Small School: High School Size and Student Behavior* (Palo Aho, CA: Stanford University Press, 1964), cited in Gary Green and Wanda Stevens, "What Research Says About Small Schools," *Rural Educator, vol. 10,* fall 1988, p. 10.

[10] Cole, op. cit., footnote 3, p. 144.

[11] Ibid.

[12] Edward J. Kelly, "Our Overcrowded Schools: Current Problems and Future Prospects," *College Student Journal Monograph,* vol. 10, No. 2, Part 2, spring 1976, p. 3.

[13] Paul Lindsay, "The Effect of High School Size on Student Participation, Satisfaction and Attendance," *Educational Evaluation and Policy Analysis 1,* spring 1982, p. 60.

Far less common are empowering policies, which encourage experimentation to try to meet needs in new and innovative ways, even if it means relaxing, bending, or eliminating previous restrictions.

A comparable tension is seen in telecommunications policy. State public utility commissions are charged with protecting consumers today and keeping rates as low and as fair as possible. However, the regulations that respond to this goal may make it difficult for telephone companies under their jurisdiction to modernize in order to provide broader or more innovative service in the future. This philosophical battle has broad consequences for the future economic development in a State. Do policies mortgage today's consumer to pay for better services in the future? Another issue is equity v. public service: is it appropriate for one class of user to subsidize service to others if a public interest will be served by this subsidy?

The tension between empowerment and regulation also is evident in the marriage of education policy and telecommunications policy. Should tele-

communications policy support innovation for the educational needs of a State as a way of ultimately best serving the interest of the citizens and businesses of that State? Should educational needs drive the telecommunications policy? How can States balance the need for innovation with the need to contain rising costs for services?

OTA finds that States are today in a position to rewrite or develop new educational policies in light of the special opportunities and challenges posed by distance learning options. The broad question for educational telecommunications policymakers is how to enable practitioners to take advantage of the opportunities presented, yet meet standards for educational quality. Binding districts with restrictive regulations shaped by an older model of education is inappropriate for the new educational models distance learning can make possible. **By superimposing yesterday's rules on tomorrow's opportunities, States may be cutting off options before they can be fully developed and tried. A** regulatory moratorium may be needed to allow for experimentation and evaluation of distance learning's role in meeting critical educational needs.

STATE EDUCATION POLICIES AND DISTANCE LEARNING ISSUES

The sections below present illustrative policies addressing distance learning issues from State documents sampled in the OTA survey mentioned earlier.

General Philosophy

Most State distance learning policies are motivated by the mandate to provide all students equal access to education. Technology is often cited as a means to attain this goal. North Carolina, for example, has taken a comprehensive approach, using satellite downlinks as the vehicle for equalizing educational opportunities across the State. (See box 5-D.)

This directive from the North Carolina General Assembly is clear:

> (a) It is the continuing intent of the General Assembly that every child in the State's public school system shall have equal access to educational opportunities, no matter where the child lives or how small the school which the child attends. It is the further intent of the Assembly to encourage and subsidize state-of-the-art technology as an efficient and cost-effective means of making equal access to opportunity available to all children.
>
> (b) The State Board of Education shall establish one satellite earth station at the 54 smallest and most rural schools in the State, to insure that students in these schools have full access to all courses required in the Basic Education Program that small enrollment or lack of qualified teachers would otherwise make unavailable.[18]

Despite the general goal of providing educational equity, States are concerned that distance learning projects meet established standards for curriculum and instruction. This concern is reflected in a variety of policy statements regulating how and when distance learning technologies can and should be used. A central issue is that of certification and training requirements for the teacher delivering a course from the originating site (teleteacher), and for the teacher or classroom aide (facilitator) at the receiving site. Other issues are course credit, State approval for courses, and classroom and instructional logistics.

Certification of Teleteachers

The certification of the teleteacher is the most prominent issue that SEAS **are grappling with regarding distance learning. This is particularly true when a complete course of instruction originates in one State and is received in another State.** Most States require that any course offered for credit must be taught by a teacher who possesses a valid teaching certificate in that State. Because few States grant automatic reciprocity to teaching credentials from another State, teleteachers in multistate projects must apply for certification in each State where courses are received. In some cases, the teleteacher must not only meet individual course requirements in State history, counseling, and guidance, but also pass several competency examinations, in subject areas as well as State and national teacher examinations. Fingerprint checks and physical examinations may be required, despite the fact that the teleteacher may never physically step into the State. Finally, after meeting coursework, health, and competency requirements, teachers in multistate distance learning projects may also need to meet individual State and local requirements relative to student teaching experience, time spent in classroom

[18] General Assembly of North Carolina, S. *298,* "Learning by Satellite," sess. 1987, Apr. 6.1987.

Box 5-D—North Carolina's Distance Learning by Satellite Program[1]

In January 1988, the North Carolina State Department of Public Instruction (SDPI) and the TI-IN Network of San Antonio, Texas, entered a contractual agreement to form a statewide satellite network to provide high school instruction and staff development throughout the State. This statewide investment and partnership with a private corporation was motivated by the realization that: "North Carolina has many small, rural high schools which, because of low enrollment and remote locations, cannot offer all the courses mandated by our state's Basic Education Plan. North Carolina has desperately needed an alternative method to bring students the kind of education envisioned by developers of the (basic education) plan."[2] Interest in making quality staff development and training more accessible to all educational employees around the State was another factor spurring the Department interest.

As a first step, SDPI staff investigated several distance learning programs across the country, and surveyed principals of the State's smallest rural high schools to determine the areas of greatest Curricular need. During the 1985-86 school year, the State piloted distance learning by satellite at four sites with Federal Title II grant monies. The pilot used TI-IN Network programming and hardware to provide staff development training on the use of computers in the classroom. Participating teachers were very positive. Information on the pilot, the survey data, and examples of services that could be offered to North Carolina were provided to legislators, and the 1987 General Assembly passed the Learning by Satellite bill.

The bill appropriated just under $2 million for fiscal year 1987-88 to purchase satellite receiver equipment and hardware for 153 sites. The sites were SPDI, each of the 52 smallest high schools in the State, and 100 additional sites chosen by district superintendents for staff development programming. The legislature allocated $1.04 million for fiscal year 1988-89 for satellite programming ($944,850) and staff support for the project ($95,150).

Under the North Carolina plan, a district coordinator oversees satellite programming for all receive sites within each participating district; at each site, one person serves as manager (usually the principal or assistant principal). Each school site also has a classroom facilitator and an equipment manager. For the 52 small, rural high schoo.ls, State funds cover the annual subscription fee ($4,750 per school in North Carolina, a rate lower than TI-IN's normal subscription fee), staff development programming fees (determined by the district's average daily attendance), and course fees for a maximum of 20 students at each school ($240 per student per course per semester, plus $50 extra for foreign language and science laboratory classes). If the number of enrolled students exceeds 20, the local school must pay tuition fees. In the first year, over 1,100 high school students enrolled in the satellite classes.

OTA visited with administrators, teachers, and students participating in the first-year effort in North Carolina's Region 8. The project got high grades for expanding curriculum offerings and for the quality of teleteachers, but there were concerns regarding student/teacher interaction. As one principal stated: "In a small school like ours, students are used to a great deal of **individual attention.** We had to adjust our attitude on this for satellite classes."[3] And, as in many distance learning projects, coordinating bell schedules, school calendars, and grading periods presented problems. Although each of the principals was pleased to have TI-IN classes in their schools, six of the seven indicated that, without State funding, the program would not continue. As another principal said: "This is something which the State has provided and I'll use it. But, this is not something that I would go out and purchase for our own school from local monies."[4]

North Carolina is a member of the TI-IN United Star Schools Network and has added 17 new sites to the statewide network as a result of Star Schools funding. Under special arrangements with TI-IN, North Carolina uses the network for staff development 1 hour per week. SDPI also developed their own 18-hour methods course for teaching foreign languages in the elementary grades, which is available on the network.

North Carolina's distance learning efforts are expected to expand to more schools and to offer a wider array of programming in the future. This support is grounded in the bill that authorized the program: "It is the intent of the General Assembly that the Distance Learning by Satellite program shall be an ongoing component of the public school system and that operational funds for the program shall be included in future continuation budgets."[5]

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[1] Much of this discussion comes from Bruce Barker, Texas Tech University, "Distance Learning Case Studies," OTA contractor report, June *1989.*

[2] Elsie Brumback, assistant superintendent, North Carolina State Department of Public Instruction, in *TI-IN Network News, 1988,* p. 1.

[3] Barker, op. cit., footnote 1, p. 20.

[4] Ibid., p. 21.

[5] General Assembly of North Carolina, "Learning by Satellite," Senate Bill 298, Sess. 1987.

instruction, and possibly additional requirements of individual school districts.[19] When a distance learning course is taught by others, whether they be university professors, scientists, artists, poets, government officials, or any other subject matter experts, these restrictive requirements may make it impossible for the course to be accepted in a particular State.

At present, there are no generally applied standards for teleteachers. Some States (e.g., Utah, Nevada, and Alaska)[20] do not require certification for the teleteacher in either the State where the course originates or in the receiving State. Others (e.g., Idaho and Washington)[21] require certification in both the sending and the receiving State. These statements from Idaho, Minnesota, and Montana illustrate three different approaches:

> A teacher must hold a teaching certificate valid in the State where the program originates and must meet the minimum academic requirements of the Northwest Accrediting Association.[22]

> The satellite course teacher must have a Minnesota teaching license.[23]

> To use distance learning programs, local school districts shall apply for art alternative by validating that the teachers of distance learning courses are certified and appropriately endorsed in Montana or in their resident State and have experience in delivering instruction via distance learning.[24]

Many States have not yet established a policy regarding certification of teleteachers and the teleteachers are approved on a case-by-case basis.

Several of the producers of satellite courses for high school credit have worked out separate arrangements for certification of their teachers across State lines. In the Satellite Telecommunications Educational Programming (STEP) network, which originates in Washington State, all high school teachers hold current Washington State teaching certificates.[25] Reciprocity agreements for teacher certification have been arranged in the seven other States receiving STEP high school courses. However, this reciprocity varies among the receiving States.[26] Teachers in the TI-IN Network, a private corporation supplying a range of courses nationwide, must hold teaching certificates for each of the States in which their courses are received. In Oklahoma State University's Arts and Sciences Telecommunications System (ASTS), all teleteachers are university professors and generally do not hold K-12 teaching certification. However, ASTS requires that facilitators in the receiving classrooms must be certified teachers, although not necessarily endorsed in the distance learning course subject. ASTS staff work with SEAS and, to reassure reluctant State education personnel about the quality of the teaching over the system, send them tapes of their teleteachers teaching lessons. With their courses now being used in classrooms in 35 States, ASTS has been turned down by only 1 State.[27]

One lever for dealing with the issue of cross-state certification of teachers may be the professional standards being developed by the National Board for Professional Teaching Standards, formed in 1987 as a result of recommendations in *A Nation Prepared: Teachers for the 21st* **Century .28 The** Board's goal is to improve education by raising the standards of the teaching profession by recognizing first-rate teachers, providing them with better compensation, and

[19] Lloyd Otterman and Pamela Pease, "The Role of Private Business in Distance Gaming: The Educational Partnership," OTA contractor report. June 1989, pp. 17-18.

[20] Northwest Association of Schools and Colleges, "Survey of Distance Learning," unpublished document, December 1988.

[21] Ibid. Both these States indicated they are studying the issue. In Washington, the standard is considered most important if the course is used to meet graduation requirements.

[22] Idaho Department of Education, "Idaho Guidelines Regarding Distance Learning," unpublished document, 1987.

[23] Gilbert M. Valdez, manager, Instructional Design Section and James E. Sauter, assistant commissioner, Division of Education Effectiveness, Minnesota Department of Education, "Satellite Course Requirements," memo outlining areas in State Board of Education rules pertinent to satellite courses, Mar. 31, 1988.

[24] Montana Board of Education, Rule 10.55.907, Distance Learning (d), effective July 1.1989.

[25] See Bruce Barker, Texas Tech University, "Distance Learning Case Studies," OTA contractor report, June 1989.

[26] For example, one STEP hi@ school teacher, certified to teach precalculus/calculus, was required to take a first aid course in order to teach in Oregon, even though the course is broadcast from Washington State and she may never enter the Oregon classrooms receiving her course. Debra Willson, STEP teacher, Spokane, WA, personal communication, June 16, 1989.

[27] Smith Holt, Oklahoma State University, personal communication, August 1989.

[28] Carnegie Forum on Education and the Economy, A *Nation Prepared: Teachers for the 21st Century,* The Report of the Task Force on Teaching as a Profession (Washington DC: May 1986).

placing important decisions about teaching policy and practice in their hands. The certification process is one key step toward these goals.

At present, teachers are subject to State licensing systems that set minimum entry-level standards and vary considerably from State to State. The national certification, which would be voluntary, goes beyond this minimum proficiency level. Board certified teachers will have to meet high and rigorous standards of experience, creativity, professional judgment, and teaching skill, as determined by a range of assessment procedures including such techniques as simulations of classroom situations, observations of teachers in a school setting, interviews, essays, oral defenses of teaching portfolios, and written examinations. The concept of national certification will, in many respects, correspond to the standards applied in the certification systems used by other professionals in such fields as medicine, architecture, and accounting.

Because the Board expects to adopt a single set of standards and assessment practices to be applied uniformly across the country, it is anticipated that State reciprocity agreements will be facilitated, making it easier for teachers to teach in States other than those in which they were originally licensed. This is important in light of today's variable demand for teachers from State to State. It also has implications for the question of cross-state acceptance of teachers on distance learning systems. Since the national certification process goes above and beyond what would normally be required to teach in any one State, it would appear that a Board certified teleteacher would be acceptable to any State. There has as yet been no discussion of creating a separate certification around a subspecialty of distance learning or teleteachers, but the concept could evolve, especially if distance learning projects continue to blossom across the country. Finally, distance learning technologies themselves may be used as apart of the assessment procedure. Teachers could be observed in their everyday teaching activities and evaluated based on a set of these observations.

Requirements for Classroom Facilitators

There is great variation in State policies regarding the facilitator or monitor, the person responsible for the students at a receiving site. Policies range from the most open[29] to the most restrictive. In States like Washington, the on-site monitor must be certified in the subject being delivered if the course is used to fulfill graduation requirements.[30] It may be in cases such as this that the teacher has general certification, for example, high school mathematics, but is not trained to teach a higher level course such as calculus or an Advanced Placement course. In such instances, the classroom monitor can be learning how to teach the course and may indeed take over teaching that subject in subsequent years. Several States (e.g., Alaska and Oregon) require a teacher as a monitor, but do not require that they be certified in the subject. Most common is the model in which noncertified personnel (aides) serve as monitors, usually after special training. In some cases, these aides must be supervised by certified staff.

Training and Staff Development

Several States have established policies that mandate inservice or preservice instruction for any aides or teachers involved in distance learning activities. For example:

> The satellite classroom instructor shall receive inservice training pertaining to the course organization, classroom management, and technical aspect....[31]

> The teacher will participate in instructional and technical inservice education developed and made available by the developer or sponsor of the approved course.[32]

These States recognize that successful implementation of distance learning activities require that the teleteacher be trained in the most effective use of the medium, and that the on-site monitor be trained in classroom management. One State with considerable experience in distance learning produced a guide

[29]For example, in many of Minnesota's district-run projects using two-way video interactivity there may be no adult at all in the receiving classroom. See Minnesota Department of Education, Instructional Design Section, *Interactive Television Teaching*, Integrating Technology Series (St. Paul, MN: 1988).

[30]Northwest Association of Schools and Colleges, Op. Cit., footnote 20.

[31]Oklahoma Department of Education, "Accreditation of Learning by Satellite Courses," unpublished document, 1988.

32 Montana Board of Education, op. cit., footnote 24.

Photo credit: Swenon Photo-Braharr

In some projects using two-way video, no teacher or facilitator is required in the distant classroom.

for teleteachers suggesting techniques for delivering effective personalized instruction via distance learning.[33]

Each of the major organizations now delivering coursework by satellite specifies the skills and training necessary for the site monitors in their systems. Some States have also required facilitator training.

> To use distance learning . . . a school shall verify that local facilitators (not necessarily certified) who assist students in receiving the instruction on-site have adequate preservice training and local supervision.[34]

Course and Teacher Evaluation

Most SEAS have a responsibility for the quality of instruction or instructional materials used in the schools in their States. Two types of rules have been proposed: either that districts show evidence of course effectiveness before adopting distance learning courses, or that districts establish a system to assess the effectiveness of a distance education course during its use.

The Texas Education Agency refers to the responsibilities of districts with the following statement:

> Schools that use alternative delivery procedures. . . should have written policies governing those options. Distance learning . . . should at least

[33]Minnesota Department of Education, op. cit., footnote 29.

[34]Montana Board Of Education, op. cit., footnote 24.

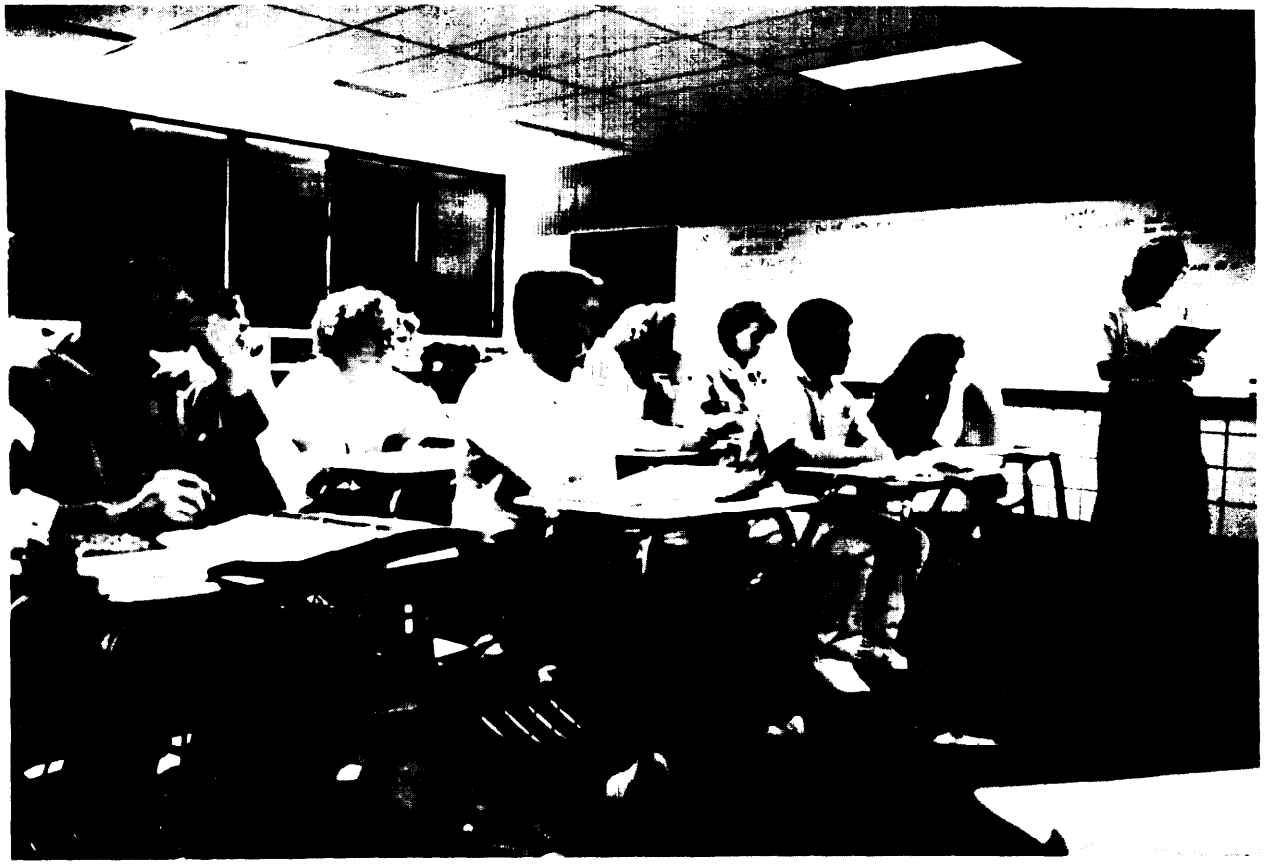

Photo credit: STEP Network

Each of the multistate course providers specify skills and training necessary for site monitors in their systems. Here Kathy Hansen monitors a STEP Advanced English class at Riverside High School.

have written policies for its governance. Each district's policies shall include responsibility for evaluating the instructional effectiveness of the delivery procedure as reflected by student mastery of intended skills and essential elements. By granting credit, the school district accepts responsibility for the level of student achievement attained in distance learning courses ., . the contracting district, by virtue of granting student credit, can be held responsible for the quality of instruction by distance learning.[35]

Although some States require evaluation of distance education courses, whether this evaluation is the responsibility of the local school district or of SEA, little guidance is given specifying the instntments, criteria, or processes to be used. Missouri provides an exception. (See table 5-1.)

What is noteworthy is the fact that these criteria are generally no more than the standards that would normally be applied to any course, whether traditional or delivered by technology. While holding distance education to the same standard as any other type of education is important if it is to be accepted as legitimate, the unique characteristics of distance education courses warrant additional criteria. These might include topics such as:

- degree of interactivity in the logistical and instructional design of courses and supplementary resources;
- guidelines to help State and local educators in the process of deciding between courses using different delivery systems; and
- criteria for assessing the relative value of live versus delayed interaction.

[35]Texas Education Agency, *Guide to Distance Learning as an Alternative Delivery Procedure,* GE *7301* 04 (Austin, TX: March 1987).

Table 5-1-Missouri Evaluation Criteria for Electronic Media Comes

The course has been developed *on the basis of clearly stated* learner *outcomes or objectives:*

. *The* course has been developed based on a set of learner outcomes or objectives that are stated sufficiently clearly to communicate to school district staff and students.

. The learner outcomes or objectives are stated in a manner that implies measurement through testing, observation or evaluation of student performance or products (themes, essays, projects).

. The learner outcomes or objectives encompass content comparable to that which would be included in a traditionally delivered course in the same subject and at the same ievel.

The course is logically *organized and developmentally suitable for the grade level(s) at which it Is intended to be used:*

l *The* course content appears to be organized in a logical sequence appropriate to the subject and recommended grade levels.

. The course content is developmentally appropriate for age groups or grade levels for which it is intended to be used.

The *course* includes *teaching stratagies and resource meterials which* l *m educationally sound, address a variety of learning modalities, and* are *consistent with the learning styles of the age* groups for which *intended:*

l Teaching strategies are varied and intentionally address al three major learning modalities-visuai, auditory, tactile/ kinesthetic.

l Teaching strategies emphasize those most appropriate to the subject and for the age group for which the course is primarily intended to be used.

l Teaching strategies are consistent with research on effective teaching-i.e., they incude frequent review, guided practice, extensions (enrichment), and correctives (reteaching).

l Textual materials support the stated learner outcomes or objectives, both in terms of content and organization.

l Textual materials are appropriate in focus, vocabulary, and reading level for the subject and grade levels for which intended.

l Supplementary resource materials (either provided or recommended) support a variety of learning modalities.

l Supplementary resource materials (either provided or recommended) support extension (enrichment) and correctives (reteaching) activities.

The course includes both formative and summative tests that are closely aligned *with stated learner outcomes or objectives and provides for frequent feedback to students:*

. There is a series of formative tests intended to be administered frequently and relating to instruction provided in the immediate past.

l Formative tests are clearly related to and appear to validly assess student performance on a limited number of stated learner outcomes or objectives.

l Formative tests are scored and the results returned to students quickly together with comments and opportunities to discuss individual results.

. There is a series of summative tests intended to be administered periodically which relate to instruction on a defined set of objectives or learner outcomes.

. Summative tests are dearly related to and appear to validily *assess* student Performance on a defined set of learner outcomes or objectives.

l Summative tests are scored and the results returned to students quickly together with comments and opportunities to discuss individual results.

The course has bean reviewed by subject matter experts for content validity l *nd objectiveness of presentation:*

. *The* course has been reviewed and found to be valid in terms of content and objective in terms of presentation or reviewers believe the content to be valid and the presentation objective based on their review.

The *coures has been demonstrated to be effective in achieving stated learner outcomes:*

. The course has been used by school districts and found to be comparable to traditional courses in terms of student outcomes.

. The course has been field tested, and results of the fieid test indicate that it achieves stated student outcomes.

. The course has neither been field tested nor used by school districts, but it is so well developed it should be approved for use in Missouri on a trial basis.

The *course includes instructional and technical inservice education for the local classroom teacher:*

. *The* course developers provide comprehensive inservice education on the instructional role of the local classroom teacher in delivering the course.

. The course developers provide comprehensive inservice education in utilizing the textual and nontextual instructional materials provided or recommended for use in the course.

. The course developers provide inservice education in the technical aspects of operating and utilizing all equipment necessary in delivering the course.

The course meats high standards of quality in production and presentation:

. Appropriate production techniques are used to focus on the critical components of the instructional setting.

l Oral communication is clear and understandable; the language is appropriate for the subject and the age or grade levels for which the course is intended.

l The use of music, special effects, graphics, and set design contribute to the overall effectiveness of the instructional presentation.

l Lighting and sound are consistent in level and intensity from scene to scene and contribute to the effectiveness of the presentations.

l The instructor's style, appearance, voice, and movements are natural, pleasing, and contribute to the effectiveness of the presentations.

l The director successfully manages the integration of all production elements to achieve an effective instructional presentation.

Local *classroom taecher/monitor qualifications:*

. List below the major instructional and noninstructional activities required by the course to be conducted by the local classroom teacher/monitor; the knowledge, skills, or competencies reasonably required to perform each activity at a desirable level; and the qualifications most likely to ensure that a classroom teacher/monitor would possess the knowledge, skills, or competencies.

SOURCE: Missouri Department of Education, "Recommended Evaluation Instrument for Accredited Instructional Programm Via Satellite," unpublished document, February 1989.

Photo credit: Bill Davie, Trinity Productions

Small classes can be combined to use teachers more efficiently. Some States restrict the total number of students enrolled in all sites.

Finally, if distance learning technologies are to move beyond the experimental stage and become options available on a regular basis, States will need to support evaluation efforts. Educators considering the role of distance delivery of instruction need data telling them what needs distance learning can meet, under what circumstances, and at what cost.

Classroom and Instructional Logistics

Although it would seem that classroom logistics are the responsibility of a school district, some States place restrictions on their districts. One major issue in this category is class size. For example:

> Since the teacher at the sending site interacts with, evaluates, and remediates students, the maximum class size shall not exceed 32 pupils per teacher. This may limit enrollment at a given receiving site and it may also limit the number of receiving sites based on the total number of students that are enrolled per hour, per teacher.[36]

In this case, not only is the standing rule on class size in traditional classes extended to distance learning classes at a receiving site, it is further extended to the total number of students enrolled at *all sites* during that time period. This policy indicates the strong belief in the instructional value of small classes and the need to guarantee opportunities for traditional modes of student/teacher interaction. It does not, however, consider alternative ways to provide interaction in distant classes.

Another logistical issue is the use of live versus taped broadcast course sessions. In both Oklahoma and Montana, districts are directed to use live sessions even if it means altering the class schedule. Scheduling is exacerbated when transmissions cross time zones, since a class broadcast from Texas at 9 a.m., for example, would be received in California at 7 a.m., before the school day normally begins. Furthermore, students may lose flexibility in scheduling their other classes at the school in order to accommodate the fixed schedule of a satellite class. Difficulties in coordinating school holidays, vacations, and daily bell schedules have been a barrier to broader acceptance of distance learning classes, and the situation is made even more difficult if live broadcasts must be adhered to at all times.

Credit

State policies regarding student credit may encourage the use of distance delivery of courses, as in this example from Missouri:

> Courses delivered primarily through electronic media may be offered by school districts and counted toward meeting the curriculum standards and State minimum graduation requirements if approved and implemented in accordance with this rule.[37]

Other policies limit the number of courses that may be offered via distance delivery by placing restrictions on allowable credits or in the way that credits are calculated:

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[36] Idaho Department of Education, op. cit., footnote 22.

[37] State of Missouri, 5 CSR 50.340.100, "Department of Elementary and Secondary Education," 1987.

> Credit earned via distance learning is to be limited to 3 units or 6 semester credits for graduation purposes.[38]

> Three units of satellite course credits may be applied toward graduation requirements. Districts designated as isolated may request permission from the Department of Education to offer a fourth unit of credit.[39]

> Superintendents in Minnesota schools considering offering courses to their students via national satellite networks are reminded that these courses are still subject to the State Board of Education Rules, and that these rules require that one credit/hour is equal to 120-clock hours, while the number of hours in a satellite course vary with the different course Providers.[40]

State Approval for Courses, Content, and Instructional Materials

Many States require that school districts apply to SEAS for permission to use distance learning programs. In some cases there is a review of courses independent of any district usage, analogous to textbook approvals, resulting in a statewide approved purchase or usage list for curriculum programs. This can be a major hurdle for multistate distance learning projects, with each State having different requirements related to subject matter taught, the scope and sequence of that subject matter, the amount of time devoted to each topic, and what type of credit may be granted for successful completion of the courses. Idaho, Oklahoma, Missouri, and Montana are examples of States that have a formal application process specific to distance learning, especially geared for courses delivered via satellite.

Concern for the content of courses delivered via technology seems to parallel that for standard courses. Content review is part of the approval process. In some cases, this approval requires the use of texts also approved by the State. For example, Oklahoma regulations specify:

> Satellite courses offered for high school credit shall utilize textbooks selected from the Oklahoma approved list of textbooks. Exceptions will be made for advanced placement courses by the Accreditation Section.[41]

These requirements can create barriers to multistate course offerings. As one supplier of multistate courses suggested:

> It is literally impossible to offer a course in which there is a standard text that is used nationwide. Many States pay only for State adopted textbooks so, to the extent an alternative book is used then the local school district has the burden of paying for a new one. This poses a hardship on many school districts and negatively impacts the use of distance learning.[42]

ENCOURAGING INNOVATION AND BROADER APPLICATIONS OF DISTANCE LEARNING TECHNOLOGIES

The policies discussed above tend to be restrictive-protective of State insistence that courses meet minimum standards based on models of traditional instruction. Few States have adopted empowering policies to encourage experimentation based on a new vision for education. **If distance learning is viewed in the context of a restructured education system, new recipes for educational organization are suggested. These issues include alternative funding models, new concepts surrounding curricula and instructional design, and opening doors to new institutional relationships and interstate cooperation.**

Policies could support demonstrations of innovative alternatives to the status quo. For example, most distance learning projects are now funded in the same fashion as other education activities. But creative models have begun to appear. Missouri enacted a tax on the rental of video cassettes to support distance learning activities. The State estimates that approximately $5 million will be raised in the first year.[43] In other States, special bonds have been issued. In still other States, cooperative ar-

[38] Idaho Department of Education, op. cit., footnote 22.

[39] Arkansas response to the Council of Chief State School Officers Survey, op. cit., footnote 17.

[40] Valdez and Sauter, op. cit., footnote 23.

[41] Oklahoma Department of Education, op. cit., footnote 31.

[42] Otterman and Pease, op. cit., fOOtnOte 19, p. 14.

[43] S. 7@ stipulates that video rental taxes shall be collected for 5 years. Legislation provides for grants to educational institutions to fund the purchase of technology and instructional programming for both students (courses) and for teachers (inservice training). Betty McCarthey, Missouri Education Satellite Network, personal communication, April 1989.

Photo credit: *Bill Ollikkala* for Talcott Mountain Science Center

Telecommunications make it possible to offer innovative courses using teachers who come from a variety of backgrounds. Here Dr. Eugenie Clark discusses "Life in an Undersea Desert" on a Talcott Mountain Science Center Interactive Teleconference.

rangements with the private sector have supported the development of the technology base, with users paying for their participation on a subscriber basis.[44] In Oklahoma, the State has provided "small school cooperative grants" totaling $3 million, with approximately $1 million for distance' learning), to encourage activity benefiting these schools. In response to this policy, some rural electric cooperatives have contributed satellite dishes to schools in their service areas .45

Should funding formulas designed for traditional classroom settings be revised to accommodate the new circumstances of distance learning? What new funding formulas could be devised to provide incentives for cost-sharing across districts or across educational levels? When only contact hours are counted, or bodies in the building, or course units offered over a semester, then technology enhancements that require different instructional time allotments may be impossible. And what of cost-sharing among States?

Similarly, existing State curriculum policies discourage development of new curricula that cross traditional disciplines or grade level boundaries. However, cross-curricular design can be enhanced by distance learning systems that combine the best of many teaching resources beyond what any one classroom teacher could previously offer. How will interdisciplinary or other open-design courses be counted toward State graduation requirements?

Instructional design issues are also neglected. Distance learning technologies, especially when used in combination with computers and other interactive technologies, can offer new instructional possibilities that can and should be reflected in the design of distance learning courses. The expanded use of distance learning technology could contribute to a reawakened concern that questions the qualitative standards of good instructional design. State policy rarely provides incentives to try new instructional approaches, and thus new efforts may never get off the ground despite their potential to improve curriculum.

Interagency Coordination

As discussed above, State legislative planning documents are calling for broad planning and coordination among the various State agencies, communication authorities, and public and private utilities involved in each State's telecommunications systems. Each level of education providers in a State (K-12, community colleges, vocational/technical schools, and universities) also has a stake in these outcomes. SEA's role in planning for future telecommunications services should be clearly articulated. In the case of ever-expanding communications networks, the issue for educational institutions will be: "who controls the highways."[46] With early and aggressive involvement in the planning process, **educational institutions can shape the systems to assure that the specialized needs of education are articulated and receive equal, if not preferred, service.**

There is another motive for increased coordination. The ability to negotiate favorable terms and conditions with competing telecommunications suppliers is enhanced because the education community within a State is likely to be a major user. **Together with other cooperating State and local agencies, educational institutions represent a substantial**

[44]For example, under an arrangement between New York Telephone and New York State's Board of Cooperative Education Services, the telephone company will develop the infrastructure to link five districts in Long Island, and guarantee a fixed 10-year service and subscription fee. Kevin Fennel, New York Telephone, personal communication, May 31, 1989.

45 Holt, op.cit., footnote 27.

[46]Rich Gross, Kirkwood Community College, "The Impact of Educational Telecommunications," unpublished manuscript, May 1989,

amount of buying power that can be leveraged in a competitive market to ensure the availability of flexible, cost-effective systems that meet the particular needs of the distance learning community.[47]

TELECOMMUNICATIONS REGULATION AT THE STATE LEVEL

Although the Federal Government has responsibility for setting national telecommunications policy (see chapter 6), States have a large role in developing regulations for provision of telecommunications services within their borders. These in-state telecommunications policies have a large impact on the provision of distance education services.

The State Public Utility Commissions (PUCs) or Public Service Commissions, through their regulation of telephone service and rates within a State, play a growing role in the State distribution of distance learning services that use the telephone lines to transmit voice, video, and data between sites. The rates and policies vary broadly from State to State. As noted in a paper on distance learning:

> At the State level of government, most State PUCs and, in some cases, State legislatures are now grappling with many of the same types of issues regarding the role of competition and regulation that the federal government has grappled with for more than two decades. Some of the issues represent fundamental philosophical concerns, such as whether the concept of "universal service" should be expanded to include access via telecommunications to basic information resources. Other issues center around the introduction of competition. For example, while all states now allow some form of long haul competition, many are struggling with the issue of how much competition, if any, should be allowed for traditional local telephone services. They are also trying to deal with how to fairly allocate costs among competitive and monopoly services, and many states are in the process of deregulating competitive services or relaxing the regulation of services that are at least subject to some competition.[48]

If the rates set by the State PUCs are based on commercial payment expectations, schools may be priced out of the market and find themselves unable to pay for the telecommunications that run their distance learning systems. Basic telephone service is a not insubstantial piece of the yearly budget of schools. When telecommunications needs expand, budgets will be forced to rise. Some have argued that schools should have a special education rate to make it easier for them to take advantage of the advances telecommunications can make to improving education. The marriage of State concern for education and State telecommunications policy could **provide a forum in which schools' distance learning needs and requirements could be given special attention.**

Furthermore, with each State having one or more commissions that regulate telecommunications, it becomes difficult for multistate programming providers and telecommunications companies to coordinate and provide services. What is allowed and available in one State may be available under different conditions in another State, or not available at all. The rapid changes taking place in State telecommunications policies are often difficult to follow, putting a burden on potential service providers to locate and understand the regulations stemming from a myriad of commissions and boards that set the terms under which providers must operate.

The problem is compounded when regional networks are established, linking services across State lines. The regional Bell Operating Companies each serve several States; some are actively supporting cooperative educational networks serving some or all the States in their regions. For example, New England Telephone, part of the NYNEX Corp., is working with Maine, Vermont, and New Hampshire in considering the creation of a Northern States Long Distance Learning Cooperative in which the interactive projects within each State could be linked to provide broader economies of scale. Organizational issues and concerns for "turf" must first be overcome, as well as technical barriers (the three States have each taken different technological approaches to their in-state networks). A third issue is regulatory. Recently the Federal Communications Commission (FCC) changed the criteria for "contamination" of an intrastate circuit, allowing up to 10 percent of an intrastate network's traffic to be interstate without reverting to FCC tariffs. The

[47] Gallagher and Hatfield, op. cit., footnote 1, p. 5.

[48] Ibid., p. 8.

crossover between State and Federal regulatory telecommunications policy is exemplified in this compromise.

Several States have or are in the process of undertaking major studies of their future telecommunications requirements and infrastructure as a means to ensure the competitiveness of industry within the State and to serve social needs across the State.

> These State proceedings and studies are especially important to educators and groups interested in distance learning because their telecommunications requirements are often at the State and local level rather than at the national level. The proceedings are especially important because they will impact on the choices of technology and the prices and terms and conditions under which distance learning delivery systems are available to the education community. It is at the State level where educators can take hold of key policy levers; since education is largely State and local government-controlled, State telecommunications policy should be particularly sensitive to its needs.[49]

SUMMARY

Policymaking in the distance education area is not just education policy, and not just telecommunications policy, it is both. Hence, it is important for individuals from both fields to be involved in the policy process: educators who know what they want and what they need, and technology and telecommunications people who know what is possible and what may be available in the future. It is from the convergence of these two interests that the most successful policies are likely to emerge.

The policies require new perspectives and coordination among all players. As one educator noted:

> Since most of the learning technologies and telecommunications capacities were not invented when many of the policies and regulations were drawn, a particular sensitivity must be placed on the review of laws, policies, and regulations from the transcendent perspective those technologies now afford. For instance, policies, programs and funding sources that support distinct telecommunications systems for home delivery of TV, public library database access and inter-library resource sharing, elementary and secondary instruction and management and postsecondary instruction and management—all in the same community—would be ... extremely redundant, costly and probably reflect less capacity in all independent cases than might be true if developed as a comprehensive system.[50]

Most distance education policies will be initiated at the State level, since States have primary responsi - bility for education. Furthermore, many of the telecommunications decisions made by State PUCs will surely shape what educational services can be provided via telecommunications and whether the K-12 education community can afford them.

Nevertheless, national telecommunications policies will also determine much of what telecommunications services States are able to choose from.[51] And, because of the borderless implications **of distance learning, there is clearly a role for the Federal Government. The Nation's educational interests would be served if the Federal Government provided assistance to States that need help, enabling them to undertake comprehensive educational telecommunications planning before charging ahead.** One form of assistance could be technical assistance, making it possible for States that are further along to share information and technical resources with those States or regions lacking in expertise or experience. The Federal Government could also provide financial assistance to States in the form of planning grants.

Finally, a warning. Unless the education community at all levels makes its requirements and needs known to the suppliers and to the telecommunications policy makers, the schools may not be fully served, students could miss out on the enormous benefits available, and the promise of distance learning may not be realized.

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[49] Ibid.

[50] Gregory M. Benson, Jr., "Technology Enhanced Distance Education: The Promise of New Opportunities for Lifelong Learning in New York State," paper presented to the International Conference on Distance Education, Oslo, Norway, July 1988.

S] For an extensive discussion of these issues, see U.S. Congress, Office of Technology Assessment, *Critical Connections: Communication for the Future*, OTA-CIT-407 (Washington, DC: U.S. Government Printing Office, in press).