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Distance Learning

Star Schools

This article describes the Star School Program, the first federally sponsored program to improve primary and secondary education by means of distance learning. All projects must constitute partnerships and offer substantial opportunities for participation by metropolitan universities.

In the last two decades we have done much to extend the advantages of education to excluded populations, i.e., the disadvantaged and poor, the disabled, the limited English language students, and others. However, because of our national attitude that does not value education sufficiently, many students graduating from our elementary and secondary schools are not fully able to take advantage of postsecondary opportunities. Too many children are still shut out of quality education in spite of the open schoolhouse door. For some the failure of service has been in the quality of education offered, for others it has been isolation and exclusion caused by their environment. This is as true in metropolitan areas as it is in remote rural sites.

The fight for educational rights has been and continues to be a long and difficult battle. Since 1954, the schoolhouse door has been opened to more and more students through court decisions and legislative actions. Yet a number of recent and current cases in state courts concerning equitable tax bases for education show that we have not, as yet, achieved equal access to education. Jonathan Kozol's latest book, *Savage Inequities*, documents this type of inequality across the nation. We have made it illegal to disenfranchise any student, but our actions have denied many of them adequate educational services.

This article is about one tool that Congress has provided to attack this problem. Distance learning has long been one of the ways by which we address such inequities. In the late nineteenth century, correspondence schools were established to make education available to people in scarcely populated states. The major effort of correspondence schools

was to provide instruction for girls who were denied equal education rights. The National Education Corporation, which is still operating today, has provided distance education for more than a century. Today, it provides a wide range of courses for individuals and businesses through a complex of electronic and print materials. Radio education has been and remains a serious medium for distance learning. The University of Wisconsin has pioneered a wide range of such programs for the business community. Manchester University in Pennsylvania developed audiographics, a method of transmitting voice as well as written and graphic material using the plain old telephone service (POTS).

In the middle 1970s, the National Institute of Education, the National Aeronautics and Space Agency, and the National Science Foundation experimented with satellite education by means of one of the early satellites, the ATS-6. The two major programs in the experiment are still active today. One was originally with the Appalachian Regional Commission, which has since become " The Learning Channel," and has in turn been bought out by the Discovery Cable Channel in November 1991. The other, the Rocky Mountain project, became the Public Service Satellite Corporation.

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These were the forerunners of today's satellite programming. The ATS-6 experiments developed the techniques and technologies used in today's distance learning programs and were very successful in demonstrating the effectiveness of providing education to remote and isolated communities. The Appalachian Commission's work especially demonstrated that distance education could provide schools with staff development in all basic areas, direct student courses, and offer lifelong, community-based education. For example, after a coal mine disaster in West Virginia, distance learning by satellite was used to give all coal miners first aid training as required by the state.

These early experiments encouraged others to utilize satellites and provided valuable lessons in distance learning for the Public Broadcasting Network. The stations licensed to colleges, universities, community colleges, school districts, and communities have played a critical role in providing educational programming to homes throughout the nation, with credit for these courses being awarded by local institutions.

Since the middle 1970s, technology has evolved at a very rapid rate, making it possible for a variety of resources to be employed in distance learning activities. The existing base of videocassette recorders in American homes has created a new wave of home and hobby educational resources. Public and cable television have begun to offer a complex array of courses, both for on-air viewing and on videocassettes. More than two million students are now earning credit by means of PBS programs. The National Technical University uses satellite transmission to provide master's programs in engineering. Mind Extension University, working with cable systems, promises to offer enough college-credit courses to enable students to obtain a bachelor's degree.

In fiscal year 1988, Congress passed the Star Schools Assistance Act and appropriated $19,148,000. Building upon a history of distance learning formats, Star Schools Projects are demonstrating new applications of technology in the learning and teaching processes. The challenge is to provide quality education to all learners, regardless of their geographic location, at a cost-effective level. The project concentrates on the satellite delivery of student courses in mathematics, science, and foreign languages to underserved metropolitan and isolated rural communities.

The act provides federal funds that allow grantees to acquire, build, design, program, and operate educational programs, requiring only that services be provided to schools eligible for Chapter One aid. Grants are for two years, and it is assumed that educational services will continue after the grant is completed. The grantee, however, must keep a record of equipment and services for a period of ten years or the life of the equipment.

Two requirements have ensured participation by the postsecondary community: Partnerships must be developed with a minimum of three partners, and services must be for statewide or multistate areas. The U.S. Department of Education has conducted two grant cycles. Four awards were made in each cycle and only multistate applicants have won grants. The project has recognized that team efforts are required to provide the best services for the students and teachers. In Mississippi, for example, a number of colleges and universities are working together on a Star Schools project, concentrating their participation on teacher training and on serving as advisors to the teachers in school.

In 1988, the first year of Star Schools, there were a few programs using fiber-optic cable for transmission, but none that could offer statewide or multistate programming. Other programs were delivered locally by the Instructional Television Fixed Service (ITFS) technology described in articles included in this journal by David Leveille and M. A. Rahimi. This telecommunication mode is not efficient beyond a fifty-mile radius and is limited to "line-of-sight" transmission. However, with fiber-optic cable networks more prevalent, most programming will be switched to this technology in order to reach multistate receive sites.

Currently, the Star Schools Program operates in forty-nine states, the District of Columbia, and Puerto Rico, with at least twenty origination sites and six thousand participating schools. In Alaska and other sparsely populated areas, there are more than two hundred students taking courses through home satellites. Others are reached through an ITFS system or by cable television.

The most common form of instruction uses one-way television with two-way audio communication. The educational services provided include high school courses, college-level modules, and graduate college courses for teacher and staff development. The principal technological problem faced by the grantees has been the inadequacies of the domestic telecommunications infrastructure in the locations most in need of distance learning. Some of the rural telephone systems have functioned very poorly. In addition, it is difficult for many inner-city schools to have a telephone installed in classrooms.

Evaluations indicate that distance learning students enrolled in high school courses function slightly better than students in traditional classes. One reason may be that students who choose such courses are higher risk takers and more self-directed than the average student. However, as the program grows and more students are enrolled, it is expected that all students can and will learn from televised instruction.

During the first two years of the project, the grantees focused almost entirely on high school programs. Most students were enrolled from small and middle-sized school districts. One of the programs adopted was from the Technology Education Research Centers (TERC) in Cambridge, Massachusetts. The program provided computer-based, hands-on science experience in which students could conduct experiments with real scientific probes, explore experiments with students in other locations, and, through electronic mail, discuss their findings with working scientists in colleges, businesses and government. Some of the tests involved radon testing and results were actually used by a number of city councils and school boards.

The statistics for the first two years are impressive: 8,191 high school students received course credit; 100,000 students participated in enrichment programs; 794 teachers received graduate school credit; 23,000 teachers participated in staff development activities. The project has provided almost 2,000 schools with equipment ranging from single-classroom satellite dishes, monitors, computers, and telephones to a tie into the school district's ITFS or cable system.

The second cycle of grants offers a different array of programs that provide a greater variety of opportunities, technology, and cooperative ventures. All projects have specific research elements that focus on a course-by-course impact on students and teachers. Star Schools courses range from third grade science to advanced-placement high school courses.

The Central Education Telecommunications Consortium (CETC), operated by the Black College Satellite Network, is bringing together sixty-five school districts with nineteen traditionally black colleges to foster elementary and high school programs. An essential element of this program is the building of teams of resources by pairing black colleges, school districts, and the community.

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The roles of the participating colleges and universities have become more focused through these two funding cycles. Greater participation of senior colleges and universities in the Star Schools projects is actively being sought by the other partners at this time. More involvement by higher education is needed to enhance teacher in-service training, an important component of all the projects. Colleges and universities are also needed to help in courseware design and to provide access to computer networks. The students and teachers in the schools need to access networks to communicate with each other at times other than during class.

All of the second-round Star School grantees are working with postsecondary institutions. Spokane Falls Community College provides courses with which high school students can receive college credit. Seattle

Pacific University offers college credit to administrators and teachers for in-service training. Leslie College delivers teacher training in the technologies and courseware design. California State Polytechnic University-Pomona offers mathematics classes for high school students, and the California State University System provides entry into CSUnet, the electronic network linking the CSU system, and to Internet, the largest national educational network in the United States.

The Star Schools projects are a major step in creating hypermedia interactive-learning resources. In the new vision of education, as articulated by Secretary Lamar Alexander in *America 2000*, Star Schools can play an essential role in demonstrating how, as the telecommunications infrastructure of America expands, it can deliver high-quality interactive multimedia programming on demand of the learner to the home, school, and classroom. Metropolitan universities can contribute a great deal to such developments.