

The *Wall Street Journal* headline reads "On Line Teaching"; the U.S. Distance Learning Association is established; the National Science Foundation expresses support for "distance education"; the Office of Technology Assessment publishes "Linking for Learning: A New Course for Education"; and federal budget preparations for 1993 include additional monies for those government agencies engaged in "distance education."

For many, these developments constitute long-awaited recognition, much-needed visibility, and respectability for programs that have been in existence since the correspondence courses of the late 1800s. The new technology of the twentieth century was radio, and educational institutions operated many early stations delivering educational programming. Radio's potential to extend and enhance education was recognized, and by 1923 institutions of learning owned more than 10 percent of all broadcast stations. In the late 1920s and early 1930s, commercial development of the radio spectrum expanded more rapidly than did the number of educational stations.

Educators, church representatives, and labor leaders pushed for reservation of the radio channels, emphasizing their educational and cultural potential. These advocates played a major role in the passage of the Communications Act of 1934, by which Congress established the Federal Communications Commission. This gave the impetus for the educational broadcasting community to organize formally so as to ensure the future of educational broadcasting. The Association of College and University Broadcasting Stations, later called the National Association of Educational Broadcasters, and the National Committee of Education by Radio were established at that time. The 1940s and 1950s were critical in that these newly organized groups were able to push for and obtain radio channel reservations and then television channels.

Following World War II, with the returning GIs demanding greater access to education, numerous off-campus degree and nondegree programs were established. In 1950, Iowa State University went on the air with WOI-TV, the world's first nonexperimental, educationally owned TV station. Unfortunately, the Veterans Administration worried that the lack of supervision and attendance-taking in off-campus programs would lead to misuse. The result was that the VA would not authorize education benefits for distance education, except for disabled vets, and then only on a course-by-course basis with special permission by counselors.

In spite of that, distance learning course offerings expanded steadily, as did off-campus delivery sites. Since the 1950s, courses offered by television, such as New York University's Sunrise Semester, became nationally known. A dirigible circling over Indiana receiving and re-broadcasting instructional programs led to the establishment of the Indiana Higher Education Telecommunications System (IHETSD). Stanford University and a rapidly growing number of other universities videotaped engineering courses, at times distributing them by messengers bicycling around to various locations within a city.

Throughout the years, most over-the-air courses were noncredit

offerings, although many large universities and community colleges have now integrated distance learning credit coursework into their curricula. Unfortunately, until recently, obtaining sufficient coursework through distance learning to achieve a degree program has been almost impossible. Irrespective of other problems, the range of required courses just didn't exist. One exception is the field of engineering. It was the first and easiest discipline to broadcast courses from campus facilities to industrial sites. With the cooperation of industry and an initial group of nineteen colleges of engineering, the foundation for the National Technical University (NTU) was established. The NTU is now flourishing, with faculty from forty universities and with more than 4,000 corporate engineers having earned degrees via satellite. Other institutions have begun looking into the possibility of offering off-campus degrees in business.

It is conventional wisdom that the nation's educational system has been slow to react to changes in demand that are forced by external factors. The system has also been seen as slow to react to the new information technologies that mandate fundamental changes in industries from farming to banking. But a closer look at the "distance education" arena belies these statements.

Currently, emerging technologies have given form and coherence to what had been isolated activities. By the 1970s, courseware was delivered via microwave and radio; today, interactive cable, videodiscs, satellite, computers, fiber-optic networks, and various integrated combinations of different telecommunications modes make distance learning an exciting real-time reality. Education has moved from a face-to-face dissemination of words to the broadcast of words and pictures and finally to today's age of interactive technology.

Recent legislation and regulations encouraging the integration of technologies and their wider deployment have assisted greatly in moving education beyond the standard classroom walls. And as technologies become more readily available and costs decrease, more innovative applications will become widely used.

Students are more diverse in age and interests. Adult, part-time students now account for nearly one-half of all college enrollments and will likely total 60 percent by the end of the decade, many of them taking off-campus courses. Although distance education enrollment statistics are not formally tabulated, authorities in the postsecondary field estimate the number enrolled to be in the high six figures. Yet, even that is less than 5 percent of all postsecondary education students.

The availability of many different technologies with potential use in distance learning presents institutions with the challenge of choice. They must determine which mode of telecommunication is most appropriate to their needs: satellite transmission, Instructional Television Fixed Service (ITFS), or cable and other networks. That choice will largely depend on the location of the campus and the number and dispersion of the potential clientele. They need to decide on the optimal production mode to fit subject and audience, choosing among talking heads, advanced graphics and other visuals, televised live classroom, or studio production. They must explore potential partners and invite telephone company creativity, local PBS affiliate involvement, and business support. The articles in this

issue should be helpful in making these choices.

Recurrent themes in many of these articles reflect the fact that obstacles remain despite demonstrated successes. Too few faculty volunteer to participate in a mode of instruction that many still distrust. When they do volunteer, they receive insufficient recognition of the time needed for the design and delivery of televised courses. With regard to courseware, it continues to be difficult to determine the appropriate complexity of production techniques so as to serve the needs of the student body. The talking head is still the cheapest and most prevalent manner of instruction. With the serious fiscal problems facing higher education today, costs can be barriers to the successful development of distance learning. The necessary investment depends upon the variables of production, the number of sites, the number of individuals enrolled, and the need for support staff, libraries, and computer services.

Finally, external obstacles to expanding distance education programs remain. Policies of the Federal Communications Commission, the Congress, and the state public utilities commissions are often at odds, and the cable companies are frequently unresponsive to the needs of education. Also, as distance learning courseware crosses state lines, state accrediting boards will often limit recognition of credits and degrees, seeking to dissuade out-of-state options.

Despite these difficulties, as the articles demonstrate, postsecondary institutions and state education entities are actively expanding course offerings, developing intriguing new visual materials and soliciting support from the business community and other private and public sources.

The authors describe a variety of distance learning alternatives indicating the differing technical choices that are available from cable and ITFS to satellite and combinations of these technologies. Statewide networks have been in service, with South Carolina's being the oldest and North Carolina's currently the most advanced. Early studies about courseware success have been completed and the number of institutions subscribing to them have increased dramatically. Unfortunately there is no compendium of courseware offerings providing any type of rating. Most information is passed on by word of mouth. Nonetheless, the success of the programs funded by the Annenberg/Corporation for Public Broadcasting project provides a significant staple in the field.

Linda De Grand provides a background paper about distance learning, and specifically the project initiated in North Carolina. There are many variables in her program that are transferable, but North Carolina's advanced fiber-optic network infrastructure is a distinct advantage.

The Instructional Television Fixed Service (ITFS) was established in 1963 with the Federal Communications Commission reserving microwave spectrum channels for educational purposes. The California State University (CSU) System was the first to apply for licenses. Currently, sixteen of twenty CSU campuses with 250 receive sites are delivering off-campus instruction. David Leveille reports on the development of the CSU system and on the nature and use of ITFS. ITFS still remains an economical, efficient method of delivering education over short distances.

Mort Rahimi describes how Wayne State University was able to take advantage of cable legislation enacted in the early 1980s to obtain channel

access for a cooperative venture by institutions in the Detroit area. He provides practical technical information and organizational steps taken to maximize technology options.

Frank Borkowski provides a president's perspective that offers some insights into the University of South Florida's Open University and its evolution. The author also mentions the continuing distrust of telecourses despite reports that media-delivered courses are as good as courses on campus delivered in traditional methods.

Smith Holt discusses the barriers he found in Oklahoma, including a state legislature that questioned television as a legitimate means of providing access to education. He describes barriers as mechanical, financial, informational, individual, legal and regulatory, and a lack of national leadership. Yet, he has a successful program and predicts growth. His is a hands-on description of a one-way video, two-way audio system.

The Annenberg/CPB project has been a leader in providing grants to individuals seeking to develop creative approaches to the integration of technology into curricula and enhance distance learning options. Steve Ehrmann, the program officer who has shepherded the Annenberg/CPB New Pathways Program, understands the import of technology and the changing variables of the college community. He conveys that knowledge in the article he has co-authored with two of the grant recipients. Profiled are two very different communities, with institutions that have different structures for distance learning and face different metropolitan dynamics. Both address eliminating differences between distance learning and classroom instruction. Amy Warner and Randall Lemke offer details about their respective approaches in Northern Virginia and Indianapolis.

Frank Withrow reviews the first federally sponsored program designed to improve mathematics, science, foreign language instruction, and other subjects including vocational education as needed, through telecommunication services. The program was originally designed to reach rural areas but has since been expanded to provide for otherwise unserved populations in K-12. Postsecondary institutions have participated primarily as advisors and trainers. The importance of this article is that it chronicles the project, Star Schools, which Congress established with barely any discussion or guidelines and continues to support despite opposition from the administration.

Technological advances have resulted in numerous changes on the campus, not the least of which has been that of the library. Wilson Stahl's article leads one to reflect on the catalytic role of technological advances as they have affected the library over the past ten years. He reviews the changes that have occurred and talks about the shifting focus from acquisition to access.

An institution's ability to attract and serve the expanding and widely scattered clientele for higher education may well determine its future. The number of locations capable of receiving programming is not just limited to the classroom, but now includes the home and the workplace, the library and the storefront. It is my hope that the telecommunication projects discussed in this issue of *Metropolitan Universities* will increase readers' desire to learn more about distance education, and may induce some of them to embark upon an initiative in their own area.