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ABSTRACT

The history of instructional television, the development of the telecourse concept, current uses of instructional television, economic factors, and cooperative arrangements are considered. After the initial approach of presenting a professor lecturing as if before a class, producers of instructional television began to dramatize the subject, adopt a documentary format, and eventually, develop the telecourse concept. Telecourses combine often-sophisticated television programs with related printed materials. Telecourses are either produced for instruction or produced originally for a general audience but have suitable content and quality for instructional purposes. Currently, colleges and universities make extensive use of on-campus, closed-circuit television systems for instruction; however, few direct substantial effort to broadcasting instructional television to off-campus audiences. Some barriers to greater use of instructional television by four-year institutions are identified. The following developments in video technology are covered: satellite transmission systems, cable television systems, narrowcast technology, instructional television fixed service, and videocassettes and videodisks. It is suggested that 70 percent of the costs of instructional television are associated with acquiring and modifying the instructional materials and providing programs, while 30 percent of the total costs are for institutional support services. Consortia are a means to produce high-quality programs or to arrange for more efficient use of available telecourses. A bibliography and a list of organizations involved in developing the field of instructional television or providing information on it are included. (SW)

Instructional television— Higher education without commercial interruption

Carol Hermstadt Shulman

Instructional television is emerging as a potentially important tool for reaching student audiences in postsecondary education. In 1978-79, more than 1,800 colleges and universities used television for instruction, and 735 institutions offered complete courses over television. Some 6,884 courses were offered, enrolling nearly half a million students (Higher Education Utilization Study 1979).

But these figures are small compared to the audiences that instructional television's supporters believe can be reached. Thus the audience could be as large as 64 million—the total high school graduate population over 25 years of age that has not completed college. Of this group, 6 million are in college and an additional 12 million have taken some college but currently are not enrolled. Instructional television is particularly appropriate for the individuals in this population who are highly motivated learners and have good basic learning skills.* Most often, persons with these characteristics are mature adults (Zigerell 1979). As this segment of the nation's population grows, colleges and universities are taking an increased interest in programs directed to these prospective students. Such interest combines with new technologies, new course materials, and new cooperative arrangements among producers and users, to promote a growing use of instructional television.

History of instructional television

Current interest in instructional television recalls its early heyday during the 1950s when 114 colleges and universities teamed up with television stations to present televised college lectures (Carlisle 1974). From this optimistic beginning, instructional television fell into a decline, leaving only a few survivors such as CBS-TV's "Sunrise Semester" and the City College of Chicago's TV College.

The reasons for the disappearance of much of this programming are instructive. First, before the advent of videotape, television programs were broadcast live and stations provided studio time for instructional television only at hours inconvenient for potential students. Videotape provides greater flexibility in determining when courses may be offered. Second, even when good broadcasting time was available, there often was not enough courseware produced to attract students interested in courses for credit. And third, producers overestimated the potential student audience in a given geographic region and did not realize that long-term instructional programming must draw from a heavily populated region in order to net a sufficiently large student audience (Zigerell 1979).

As an example of successful instructional television, Chicago's TV College overcame these problems and boosted its popularity in other ways. It provided a real off-campus alternative for the Chicago-area population, enabling persistent students to build substantial credit towards or even complete an associate of arts degree. It also wisely recognized that a course should be offered at spaced intervals rather than in successive terms to prevent enrollments from dropping precipitously from one term to the next (Zigerell 1979).

The instructional television of the 1950s and 1960s might not appeal to today's more sophisticated television audiences. The "talking head" approach dominated television courses, presenting a professor lecturing as if before a class. Gradually, however, producers began to use the medium more effectively by providing dramatizations of the subject, a looting a documentary format, and eventually, developing the telecourse concept (Zigerell 1979).

Telecourses

The telecourse represents the most recent stage in the evolution of instructional television, and it is rapidly becoming the dominant mode in the field. Telecourses combine often-sophisticated television programs with related printed materials to produce a unique educational experience.

A telecourse is an examination and presentation of a body of knowledge and information through the use of sight, sound, color, movement, and print in a manner designed to stimulate and insure involvement and clarify and quantify a carefully designed and validated series of learning objectives. (Mittelstet 1979 quoting Groppe)

Telecourses may originate either as "courses for television" or as "courses from television," also called "wrap-around courses" (Munshi 1980). In the first instance, the telecourse is produced for instruction and is typically on a standard academic subject such as government or biology. The user institution arranges for rental, lease, or purchase of the course and for broadcast time, which usually is not during prime time. Printed materials are developed in conjunction with the video component. In contrast, the "wrap-around" course is a television series that was produced originally for a general audience and was broadcast during prime time on either a commercial or a Public Broadcasting System station. Its content and academic quality, however, make it suitable for instructional purposes. Therefore, printed course material is developed around the original program (Munshi 1980). In either instance, the telecourse is usually about 15 hours long, either as 30 half-hour segments or as 13 to 15 one-hour segments.

Although the television program is at the heart of the telecourse concept, printed materials and other educational activities also are essential. The basic complement to the video program is the study guide, which provides the student with learning objectives for each program and for the entire course. The study guide also includes self-graded pretests, study questions for the television program and for reading assignments, enrichment activities (required and optional), and self-graded or mail-back graded posttests (Mittelstet 1979; Munshi 1980).

Campus liaison is necessary in the telecourse concept. The extent of student-faculty relations depends on how the individual institution decides to organize and administer the telecourse.

*Peter J. Dirr (projects manager, Educational Activities, Corporation for Public Broadcasting) December 9, 1980, conversation with author.

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Contact may be limited to a written exam but usually includes other graded tests as well as several oral review sessions on campus or in a community setting. In addition, many institutions arrange for telephone consultations or occasional meetings with faculty overseeing the course (Gross 1978a).

Other telecourse courses are designed according to the demands of the subject and the course objectives. The course design may include a textbook, readings, audiovisual readings, and learning activities, such as optional museum visits for a course on the arts or reported on-campus field trips in compositions for an English composition course (Middlestet 1979). One experienced producer of telecourses notes that "the curriculum and materials must provide a framework around which faculty members are free to design their study materials" (Gross 1978a, p. 10, quoting Bourne).

Current uses of instructional television

Colleges and universities have used a variety of on-campus, closed-circuit television systems for instruction (Higher Education Utilization Study 1979). However, the most substantial effort to broadcasting instructional television is off-campus audiences. Colleges and universities are increasingly taking advantage of the new developments in closed-circuit programming that can reach adult audiences who are reluctant to come to campus for instruction. The following statistics from a four-year institution illustrate the use of television:

Forty-one percent of the faculty	use television in their courses
Twenty-four percent of the faculty	use television in their courses
Twenty-one percent of the faculty	use television in their courses
Twenty percent of the faculty	use television in their courses
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Four-year institutions face a number of barriers to off-campus instructional television. The major barrier is the lack of support for such instructional television systems. In the first instance, the faculty, administrators, and students believe that television for instructional purposes provides educational support in quality that is inferior to traditional on-campus programs" (Hershfield 1980). The survey taken in 1979 at a public-private four-year college asked whether faculty members were or were not supportive of the use of television for instruction. (The survey did not distinguish between on- and off-campus instructional television.) In the public sector 49 percent of the respondents believed that family support is a factor preventing the use of instructional television, and 31 percent in the private sector concurred (Durrant, Pedone 1979a and b). With regard to institutional support, the 1979 surveys showed that lack of such support services as scheduling, flexible registration procedures, was equally a barrier to the use of television (Durrant and Pedone 1979a and b).

These barriers to greater use of instructional television are inherent in the current system of development and course financing that dominates four-year institutions (Hershfield 1980). Traditional methods of course development involve one faculty member devising a course, often while teaching it. The salary for the course development and the teaching salary are one and the same. In contrast, production of a sophisticated instructional television course involves long-term planning, team production, and a substantial capital outlay. Most institutions are not geared up for this type of enterprise (Hershfield 1980).

Video technology

Rapid developments in video technology and telecommunications technology lead us to believe that a "communications revolution" will occur in this country over the next few years (Bonham 1980a, p. 1; Smith 1978a). One factor in this revolution is the increasingly greater flexibility in the delivery of instructional programs. That is, new satellite transmission systems, expansion of cable systems, and new home video systems provide the public with more opportunities for home viewing.

Satellites. Satellite transmission systems hold the key to the development of the communications revolution. These satellites

provide means of transmission across great distances, without the need for complex systems of terrestrial microwave relays. They also can decrease the cost of both transmission and reception from a single source to a large geographic area (Gross 1978a).

The great advantage of satellite systems is recognized. In 1974 there were only a few satellite systems, linked together by terrestrial microwave relays. Today there are more than 2,000 cable systems connected to a single satellite system (Mahoney, 1979, p. 19).

Instructional television via satellite transmission to cable networks can be illustrated, for example, the Appalachian Community Service Network (ACSN) which provides instructional television programs to many cable systems in the country via satellite transmission. ACSN now has about 500 cable subscribers and is in the development of its system.

Narrowcast technologies. Narrowcast technologies provide for a number of methods of access for learner to gain access to instructional television. The term refers to the transmission of television signals from a transmitting station to a limited number of receivers. The narrowcast transmissions go to a limited number of viewers. Cable television, instructional television fixed service, and videodisks and cassettes are examples of narrowcasting. These technologies may make the production of instructional programs for specific groups of learners more economically feasible. For example:

A market audience of 100,000 viewers who wish to take a videodisk course on psychology may wish to pay for itself, remembering that the average cost of a videotape is almost open television, half a million Americans take public television courses for credit (Bonham 1980, p. 35, 36).

Cable television. With cable television, the television signal is transmitted by wire instead of over the air. A cable system may contain more than 100 channels. Cable companies are granted franchises by local governments to wire their communities and offer programming. Currently, there are about 4,000 cable systems serving 4,000 communities and 40 million people (Baltzer 1980).

Originally intended to provide a better reception and choice of channels in rural areas, cable television is rapidly moving into urban areas (Smith 1978b). This development is significant for instructional television since urban locations provide new opportunities for reaching large audiences via cable. Further, most cable franchises stipulate that the cable system must provide educational access. The number of channels available on cable affords multiple opportunities for instructional television. In addition, cable television may encourage "participation by colleges and universities in creating and producing programs designed for the social, cultural, civic, business, and industrial

needs of their community" (Smith 1976: p. 16). Smith projects that by 1985 cable television will have about 100 million television subscribers (Banham 1980b).

Instructional television fixed service. The Federal Communications Commission (FCC) ruling, *Shifting Channels*, has been set aside in the microwave part of the electromagnetic spectrum for educational institutions. These 28 channels are now used for instructional television fixed service (ITFS). Under an institutional license, an ITFS licensee can use the 28 channels for up to four video channels to carry to other educational institutions by communication.

The microwave service extends for only about 25 miles, so the FCC may allow the same channel to be geographically separate institutions around the country (Smith 1976).

Institutions holding ITFS licenses will launch television programs to provide reception spots in the community, such as industrial sites, libraries, or schools. The advantages of ITFS are its multichannel capability, which makes it possible to transmit several programs simultaneously, and its live capability. Several ITFS programs are being used for presentation by professional development systems. For example, in the transmission of a program from the University of California at Los Angeles to a community college in Los Angeles, the program is transmitted to a local conference room where the instructor and other faculty and students can discuss the program. A Dallas-based service delivers class material to a microwave tower which

transmits the material to the recipient on any course, beyond some limits, is not efficient. It can also result in a similar cost structure, and, indeed, it is possible to expect an expected mean cost of a telecourse to be less than the cost of a traditional course. The cost of a telecourse may be less than the cost of a traditional course if the cost of a telecourse is less than the cost of a traditional course (McCabe 1979).

Therefore, to make the cost of an instructional television course comparable with the cost of a traditional course, the former must use a much larger enrollment.

Hershfield (1977) analyzes the cost differences between producing a high-technology course and a traditional course. The high-technology course involves the development of videocassettes, audiocassettes, and sophisticated written materials, and costs about \$54,000 per year over a five-year period, excluding faculty salaries. (Five years is considered the useful life of a high-technology course.) A traditional course, on the other hand, costs about \$21,000 per year in faculty salary. Hershfield concludes that to make credit-hour costs equal between the two courses would require that the high-technology course enroll 2,333 students over five years, compared to the 400 students typically taught in a traditional course over the same period.

If an institution produces its own telecourse, then an institution producing a telecourse may go beyond its own campus and lease the telecourse to other institutions (McCabe 1979). For example, a telecourse is now in production for the Dallas County Community College District will cost about \$350,000 to produce and needs a commitment of about 4,500 to 5,000 in the District as well as leasing earnings to recover its costs over its useful life. The District has succeeded in covering the expenses of the telecourse by leasing to other institutions the expenses of the telecourse (McCabe 1979).

Leasing telecourse to other institutions vary depending on the broadcast system, the type of videotape, the size of the enrollment. For example, telecourses, Dallas County Community College District charges a flat fee of \$2,750 plus \$10 per student enrolled in the first semester. The second semester charge is \$1,500 plus \$10 per student enrolled, or a flat fee of \$3,500.

In deciding whether to lease or produce a telecourse, an institution has to weigh a number of factors, in addition to the lease charges, against potential student enrollment. Some considerations are:

- Does the institution pay for the lease?
- Does it have to generate additional income from tuition/FTE enrollment to cover other "out-of-pocket" expenses, such as what is included?
- Does it have control over the tuition funds generated or do they go into the general fund of the institution?
- Does it have state or district support in any form?
- How much does it pay faculty to teach telecourses?
- What is the competition in the immediate area for students? (Munich, p. 23)

Videocassettes and videodiscs. The use of these systems made possible by the advent of the videocassette recorder system, a new opportunity for instructional television. The videocassette player/recorder has been on the market for several years and a large number of models and programs, as well as professional development materials, are available on videocassette. Videodiscs are another development in plastic disc that use a special laser. According to projections, 10 percent of the television market in America will use videodisc or videocassette units by 1985 (McCabe, Martino, and Stengel 1980).

These technologies have allowed a telecourse to the individual level, as students can use videocassettes and discs on their own time schedule, as they wish, rather than remain tied to a broadcast schedule (Smith 1981). In addition, this individualized approach

will probably mean that the telecourse will be more effective, especially if the student can take the course at a time and place of his own choosing. As with any new technology, the market will have to be tested with a sample of students (Stengel 1980).

Economic factors

The cost structure for telecourse instruction differs significantly from that of traditional on-campus instruction. Up to 70 percent of the costs of instructional television are associated with acquiring and modifying the instructional materials and producing programs. Approximately half of this amount (35 percent of the total costs)—goes for air time and faculty salaries. Traditional support services make up the final 30 percent of the costs.

With traditional instruction, however, faculty salaries account for 45 percent of the total costs, while only 10 percent goes for instructional materials. The other 50 percent of the costs for institutional support services (McCabe 1977).

Thus, enrollment is the key in determining the cost of telecourse instruction will be:

Consortia

Colleges actively involved with telecourses may form consortia to produce high-quality programs or to arrange for more efficient use of the available telecourses. These consortia may be organized on an ad hoc basis to work on the development of a single

*David Buckingham, coordinator, Cable Operations, ACSN, January 5, 1981, conversation with author.
 **Frank W. Nix, executive secretary, Joint Council on Educational Telecommunications, January 5, 1981, conversation with author.
 ***Roderick Price, director, Instructional Television, Dallas County Community College District, January 21, 1981, conversation with author.



telecourse or they may be permanent groups overseeing long range development of the production or use of telecourse material.

From the production side, consortia offer attractive benefits to participating institutions. The cooperating institutions develop a course that meets their needs, guaranteeing a substantial market for the telecourse. Pooling resources makes available a larger budget for production, so that a high-quality course can be developed. And institutions involved in the consortia have free use of the telecourse (Gross, 1978a).

One such collaborative effort several years ago produced a telecourse on American government. Four institutions participated: Dallas County Community College District (DCCCD), TV College in Chicago, Coast Community College in southern California, and Tarrant County Junior College District in Texas. DCCCD took the lead in this consortium, contributing 67 percent of the original budget, retaining complete control over the work, and providing the production staff. All institutions contributed a full-time faculty member for writing a course "narrative" from which the television script was produced, as well as a study guide, lessons, and tests (Gross, 1978a).

The resulting telecourse provided a unique perspective on American government.

Each course state requirements for study of state government that vary from state to state, the consortium members have made possible a common basic approach to state government. . . . Content experts were available to set up a case examination and interview with key officials that would have been difficult to get to do on their own. The consortium members rather than the separate American federal and state government . . . than one which might have been produced with the local resources" (Gross, 1978a, p. 2) quoted in Metcalfe.

Consortial arrangements also are adopted by user institutions for purchasing telecourses. By pooling resources institutions are able to purchase more high-quality programs than any single institution could on its own (Gross, 1978b; Hobbs, 1980). But there are other advantages as well. Consortium members share expertise in selecting the programs and in developing study guides and other printed materials (Hobbs, 1980). Moreover, by acting as a group, they have some influence over the development of telecourses, that is, they "can begin to prod producers of televised instruction towards better meeting their needs" (Gross, 1978b, p. 26).

Conclusion

People in the higher education community who are knowledgeable about instructional television see the new video technology and developments in programming as evidence that instructional television will make great gains during the 1980s. They believe it may revolutionize how adults approach access to postsecondary education. However, they see two major problems that may inhibit some institutions, especially four-year colleges and universities, from actively participating in instructional television. First, the high initial costs of developing a telecourse may seem prohibitive to college administrators accustomed to more modest demands upon the college budget. However, increasing opportunities to lease courses from an expanding group of producers can significantly reduce the costs involved in telecourse instruction and should be considered a reasonable alternative.

A second barrier confronting instructional television is the reluctance of faculty to use the new technology. Often, faculty regard television for off-campus instruction as second-class (Hershfield, 1980). Although attitudinal change often is difficult to achieve, some steps to encourage faculty approval of telecourses can and frequently are built into the telecourse system. Through the components of the telecourse (e.g., study guide,

tests, and faculty-student conferences), faculty have an opportunity to modify telecourse instruction to suit their perception of how the course should be taught.

Academic administrators and faculty need to investigate how instructional television may help them meet their institutional goals so that they can make a rational decision on whether they should use this approach. It is probable that if institutions fail to become involved in instructional television, private industry and new types of educational organizations will step in to provide educational television services to the adult population.

Information resources

Described below are several organizations involved in developing the field of instructional television or providing information on it.

■ Adult Learning Programming Department, Public Broadcasting System's Educational Telecommunications Program Service (PTV 3), 475 L'Enfant Plaza SW, Washington, D.C. 20024; Dee Brock, director. The Adult Learning Programming Department, established in July 1980, plans to make available programs to participating PBS stations and cooperating colleges. Three kinds of courses will be offered: college credit courses, informal learning courses and programs, and professional development and career training courses and programs. Participating institutions will assign the amount of credit to be awarded and provide for faculty-student liaison.

■ The Center for Learning and Telecommunications, American Association for Higher Education, One Dupont Circle, Suite 780, Washington, D.C. 20036; Marilyn Kressel, director. The Center assists postsecondary institutions in exploring the potential of technology-based programs. Projects include the synthesis and organization of information already available on telecommunications but currently scattered, a guide to major telecommunications models, and a handbook of alternative technologies.

■ Corporation for Public Broadcasting/Annenberg Higher Education Telecommunications Project, CPB, 1111 16th Street NW, Washington, D.C. 20036. Under a 15-year, \$150 million grant from Walter H. Annenberg, publisher of *TV Guide*, CPB is planning to produce college-level courses through existing and developing communications systems. The funds will be used to develop telecommunications materials and courses to be offered in cooperation with higher education institutions for undergraduate degree credit.

■ Joint Council on Educational Telecommunications, 1126 16th Street NW, Washington, D.C. 20036; Frank Norwood, executive secretary. The Council is an organization of nongovernmental associations designed to monitor and inform its members about current technologies that may affect opportunities for educational television.

■ National University Consortium for Telecommunication in Teaching, University of Maryland University College, College Park, Maryland 20742, Allan Hershfield, executive director. Launched in 1980, the NUC plans to make a complete bachelor's degree program available to home-based adult students through television and the directed study learning system developed by the United Kingdom's Open University and the University of Maryland University College. To date, seven institutions are participating in the program, with broadcasts over ten local public television stations and two cable systems.

■ University of Mid-America, P.O. Box 82006, Lincoln, Nebraska 68501. Founded in the mid-1970s, the UMA is governed and administered by a consortium of 11 midwestern universities. It

has four objectives: to develop multi-media college-level courses for study at home; to conduct research on adult learning, evaluate learner response to open learning courses, and disseminate research results; to assist the consortium members in their development of open learning delivery systems; and to distribute course materials to institutions nationwide.

Wayne State University, University Studies/Weekend College Program, College of Lifelong Learning, Detroit, Michigan 48202. Since 1973, WSU has offered this program that is designed especially for employed persons and homemakers. One component of this program is a television program produced by WSU and broadcast daily over Detroit stations in half-hour segments and repeated in live program blocks every Sunday during the term. Other components include a workshop, a conference course, and directed study courses, seminars, and electives.

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