

1988

The use of telecommunications in distance learning

J. Michael Noel
University of Northern Iowa

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The use of telecommunications in distance learning

Abstract

The advent of the adult learner, in either the role of full or part-time student or as a participant in continuing education, has precipitated more changes in the education field than any in recent memory. The growth of this group of adult learners has required colleges and universities to adapt to the special needs of the adult learner in an effort to survive. One of those special needs of the adult learner is the freedom to learn on their own time and without the constrictions of commuting to campus. A vast majority of these adult learners work full or part-time jobs while attending school and many have family commitments that make conventional classroom instruction difficult, if not impossible. To accommodate these nontraditional students and assist them in their education many institutions are turning to the concept of distance learning via telecommunications.

**THE USE OF
TELECOMMUNICATIONS
IN DISTANCE LEARNING**

**A Graduate Project
Submitted to the
Department of Curriculum and Instruction
In Partial Fulfillment
of the Requirements for the Degree
Masters of Arts
UNIVERSITY OF NORTHERN IOWA**

**by
J. Michael Noel
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has been approved as meeting the research paper requirements for the
Degree of Masters of Arts.

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Date Approved

Roger A. Kueter

Director of Research Paper

Roger A. Kueter

Nov. 14, 1988

Date Approved

Graduate Faculty Adviser

Sharon E. Smaldino

Nov 14th 1988

Date Approved

Graduate Faculty Reader

Marion Thompson

11-15-88

Date Approved

Head, Department of
Curriculum and
Instruction

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CHAPTER 1

INTRODUCTION

The advent of the adult learner, in either the role of full or part-time student or as a participant in continuing education, has precipitated more changes in the education field than any in recent memory. The growth of this group of adult learners has required colleges and universities to adapt to the special needs of the adult learner in an effort to survive. One of those special needs of the adult learner is the freedom to learn on their own time and without the constrictions of commuting to campus. A vast majority of these adult learners work full or part-time jobs while attending school and many have family commitments that make conventional classroom instruction difficult, if not impossible. To accommodate these non-traditional students and assist them in their education many institutions are turning to the concept of distance learning via telecommunications.

Distance Education

In order to understand the use of telecommunication in education one must first deal with the concept of distance education. For years distance learning was used synonymously with the term education by correspondence. With the advancements of modern technology the limits of this

term have proven to be too restrictive. Zigerell (1984) provided a more useful definition of the term distance education. He stated that distance education is a form of instruction characterized by a physical separation between the teacher and the student. The only time they would meet would be for an occasional face-to-face meeting to work on specific projects. He went further to point out the difference between distance education and correspondence courses. He said distance education, as opposed to correspondence courses, is built on opportunities for student interaction, whether those interactions are live or mediated.

Telecommunications

The field of distance learning and telecommunications in education are filled with many terms, some synonymous with these terms and others not. Instructional telecommunications and educational telecommunications are terms most generally used interchangeably and refer to the use of telecommunications technology in the field of education. Distance learning is distinguished from distance education by Zigerell (1984) when he points out that the latter is the process and the former focuses on the receiving end of distance education. Distributed learning is a term used by Kearsley (1985). He defines distributed learning as learning that is basically independent of time and space. Kearsley's broad definition of distributed

learning makes it possible for him to use the term in both the formal educational field and in the private sector such as employee training.

With those distinctions and clarifications established, a definition of instructional telecommunications must be set. Wood and Wylie (1977) define instructional telecommunications as the "direct instructional uses of television and related electronic media for specific teaching/learning applications in any formal educational or training institutional situation." This definition was purposely broad enough to cover the use of telecommunications in all formal learning/training settings, not just schools. These other settings include military training, business instruction, industrial applications, etc.

Wood and Wylie (1977) were careful to make their definition broad enough to cover educational and private settings but were quite restrictive in the use of the technologies used. Their definition restricted telecommunications to the use of television and similar electronic media. Hudspeth and Brey (1986), on the other hand, state that the meaning of telecommunication becomes broader as new applications and systems are developed. They went further to explain that information to be transmitted through telecommunication technology can be audio or video,

analog and digital signals and that these technologies can be used to transmit two-way, pre-recorded and live programming. Their definition then includes all media including audio, video and computer and takes into account the possibility of interactive settings as well as one way transmission. A proper definition then should include the use of all technologies as stated by Hudspeth and Brey and include the broad scope of use in education and the private sector mentioned by Wood and Wylie.

At this point it is proper to ask why the use of telecommunications is necessary in today's world. In addition to the previously mentioned reason regarding the restrictions and commitments of the adult learner, Moore (1987) lists several other reasons. He first cites the various learning styles and states the more approaches to teaching, the better the chance of student understanding and reaching deeper levels of understanding. He also states that some media are stronger instructionally because they give the student more control over the learning materials and so make it possible for them to be more active. He also feels that learning is more individualized because of the better feedback involved in some media. He also states that some of the newer media are more cost effective than older media. He says these new media are

getting very easy to use so the material used are less difficult and time-consuming to design.

Research Topics

The questions addressed in this paper will be: What are the primary media used in the delivery of instructional telecommunications? How do they work and what are the advantages and disadvantages of each? How are telecourses designed and what are the differences between their design and the design of standard instructional courses? What are the characteristics of the learners in instructional telecommunications courses? How do they differ from students in the traditional classroom setting? Does distance learning have an effect on the student as far as quality of learning is concerned?

Definition of Terms

Interactive system- -an instructional telecommunications system wherein each classroom location is equipped with at least microphones and audio transmitters that can relay questions and comments back to the studio classroom from where the instruction originates. Some interactive systems are also equipped with video cameras to allow visual, as well as audio, communication between sites. (Wood & Wylie, 1977)

Fiber Optics- -Bundles of thread of very pure and carefully

fabricated fiber glasses that conduct electronic signals carried on laser light very efficiently over long distances. (Wood & Wylie, 1977)

Narrowcasting- -Delivering programs over the air waves to a small and special audience as opposed to broadcasting which is sent out to the general public. (Hudspeth & Brey, 1986)

QUBE Cable System- -A two-way interactive cable system of Warner Communications first introduced in Columbus, Ohio in the late 1970's. The QUBE system uses transponder-type home terminals coupled with a code-operated switch. The viewer uses the QUBE system to select from a list of pay-per-program list available. The system has also been used extensively for polling on local and national issues (Baldwin & McVoy, 1983)

CHAPTER 2

REVIEW OF LITERATURE

Because the use of television and video are evolving as the media of choice in distance learning, most of the attention of this paper with focus on them. Television has several well-known advantages as an instructional media. Television can give the student the opportunity to view activities and events that are too expensive or inconvenient for the student to normally experience. Because of the proliferation of television in developed countries, television, whether it is broadcasted or carried on cable, has a tremendous distribution advantage over most media. A major advantage of television is that it can distribute all other forms of media without alterations. The limitations to television as an instructional medium includes the difficulty in obtaining transmission times that are convenient to the learner. In addition, television has certain educational weaknesses. Television programs are shown and then are gone which prohibits review and interpretation on the part of the student. They also elicit a passive response and are usually too-open ended and loosely structured for rigorous study.

Television

Broadcast television is used widely by postsecondary institutions. According to Lipson (1977) a survey in of

approximately 2800 colleges in the United States, 71 % reported some use of television. Fifty-two percent used television for instruction given on campus, 14 % for instruction given off campus and 32 % for noninstructional programs. Because of the pacing that regularly scheduled televised instruction gives to distance learners, some researchers have found dramatic improvement in the completion rate of correspondence courses when a regular television broadcast is added (Lipson, 1977).

The postsecondary institutions that utilize broadcast television use a variety of arrangements to deliver off-campus instructions. Almost 60 % of the institutions using television for instruction worked with public television station, 24 percent worked with cable television systems and 18 % cooperated with commercial television broadcasters (Dirr & Pedone, 1980).

In addition 30 % of the colleges and universities using television for instruction were members of consortia producing and offering courses (Dirr & Pedone, 1980). There are many advantages to belonging to such consortia. The most important advantages is the higher quality of instructional materials offered. This included a higher learner appeal, better academic content, improved production quality and a higher quality instructional design. The next advantage is the positive

relationships between the stations and the colleges followed by the commitment of the leaders. Other major advantages to these consortia include learner-centered focus; supportive context for distance learning; and a firm financial and legal basis for long-range planning (Munshi, 1980).

Even within television programs designed to accomplish the same instructional function, careful research can aid in the preparation of material that will have the greatest impact on students. Baggaley and Duck (1977) described the results of six experiments that examined the effects of particular television production techniques. The edited insertion of different audience reaction shots significantly affected the presenter's intelligibility, interest and expertise. When viewers saw a presenter with prepared notes, that person appeared less fair and more confusing. When a presenter addressed the camera directly, the viewers considered that person significantly less reliable and expert than when seen in profile.

Cable Television

About one-third of all households in the United States have cable television, wired to one of over 4,000 cable systems. In communities with high percentages of cable subscribers, cable television is used as the primary method of educational delivery (Lewis, 1983). Because systems in major markets were required to have at least 20 channels, cable television

offers a considerable outlet for educational programs. The programming potential of cable television will increase further with the use of fiber optics to provide more channels and a clearer picture, as successfully demonstrated in Japan and Canada (Ruggles, 1982).

Three levels of interaction are currently found in cable systems (Miller, 1982). On the lowest level, viewers telephone their queries and comments to the originating studio. On the intermediate level, multiple originating sites have the capabilities for two-way video and audio. On the highest level, subscribers can make push-button responses that are recorded on a computer at the cable system's control center. Thus, the viewer can take course tests at home or ask faculty member selected questions if they wish. This level of interaction is being used on the QUBE cable systems of Cincinnati, Pittsburgh, Dallas, Houston and Columbus, Ohio.

Satellites

Communication satellites with fixed orbits about the earth have been used to deliver video and audio signals among many locations over a large geographic area and are useful tools in distance learning using television. According to Feasley (1983), there are three basic types of satellite television systems. The first, a point-to-point system, has a relatively low-powered transmitter that broadcasts over a vast area. Because its

signals are very weak when they reach the ground, it requires an antenna about 85 feet across and expensive amplification equipment. The second, a distributing system, uses more transmitting power and concentrates on limited geographic area which permits an antenna half as large and much less costly receiving equipment. The third, a system for direct home broadcast, uses great transmitting power to permit the use of an antenna only 10 feet across. This is the type of satellite system that will make distance learning more accessible to the home bound.

Several organizations produce, acquire and distribute educational programs via satellites. According to Lewis (1983), in addition to the adult learning service of the Public Broadcasting System, college credit courses are also distributed over satellite by the National University Consortium, the To Educate the People Consortium and the Appalachian Community Service Network. The Appalachian Education Satellite Network illustrates the growth in the medium. The network was created in 1973 by the joint efforts of a regional planning commission and local public educators in eight states. In the first few years, about 1200 teachers received graduate credit from 13 institutions. As cost of delivery for the satellite system were comparable to campus-based courses and cognitive and affective outcomes were equivalent, the network

was expanded to serve over 3,000 student enrolled in credit courses at 70 local college and universities during the 1981-82 school year. Courses were provided 64 hours a week to 20 community meeting sites and 220 cable systems.

Another development in the use of satellites has been the formation and operation of the National University Teleconference Network (NUTN), which links 66 universities and the Smithsonian Institution to offer noncredit programs in 38 states (Desruisseaux, 1982). Educational institutions that want to lease broadcast time on a satellite and gain access to equipment that can transmit to and receive from that satellite can secure the assistance of universities already doing so or they can contact the owner of the equipment directly.

Video

Video as an instructional medium can be used in the form of video cassettes available on a loan basis or it can be used in an interactive setting of live instruction and one or more off-site class locations. The major advantage of video cassettes is the matter of student control. The student is able to watch when and where he/she pleases and with as many pauses and replays as necessary. Programs on video cassettes share the same disadvantage as television programs in that the student has a tendency to focus on the storyline and factual information and fail to analyze the relationships or underlying

messages contained in it. As a result, programs developed specifically for video cassette should be divided into short sequences of a few minutes duration. At the end of each sequence the student are directed to stop and take notes or discuss what they have seen and heard. The courses should also be highly integrated with course text books and study guides.

The use of video cassettes for training in professional organizations is extensive and growing. Hamblin (1982) report that 60,000 attorneys in California use cassettes on new legal developments that have been prepared by a self-supporting unit fo the state bar association. The national American Bar Association's Consortium for Professional Education has more than 200 videotapes with programs ranging in length from 20 minutes to 12 hours (Hamblin, 1982).

For over 10 years, Stanford University staff have been providing companies with master's degree programs in science and engineering using videotape lectures for use in the companies' own plants (Gibbons, Kincheloe & Down, 1977). They go on to explain that an on-site tutor is selected from the participating company's staff. In most cases, the tutors are practicing engineers with no prior teaching experience, but they are chosen because of sensitivity to students, an ability to draw students into worthwhile discussion of issues and a

personal interest in reviewing the content of the course. The tutors have three chief functions: to start and stop the videotape as needed for group discussion, to answer questions the class cannot resolve and to obtain answers and supplementary materials from the on-campus instructor. The on-campus staff and the videotape tutor discuss students' performance on assignments and exams over the phone.

Individuals enrolled in the videotape course must submit the same assignments as classroom students and the same person grades both sets of assignments. Both groups of students take the same examinations on campus. After three years, 82 videotape students and 65 different tutors had been involved. The 48 videotape students who met regular admission standards performed better than the students in the on-campus lecture or live television lecture with audio talkback capability (Gibbons, Kincheloe & Down, 1977).

Interactive Video

Interactive video has the major advantage of immediate feedback with the instructor through the two-way audio, and sometimes video, connection between the instructor and classes. Again, courses must be designed specifically for this medium and should include frequent requests for feedback by the instructor and all material must be designed with video medium in mind.

According to Curtis (1979), the major system that utilizes interactive video to its fullest is Instructional Television Fixed Service (ITFS). ITFS is a low-power, all directional broadcast system with a direct reception area of about 20 miles, which can be expanded by signal repeaters and linked systems. Each ITFS licensee is permitted up to four channels that could be used separately to serve different audiences simultaneously. The system also has a two-way audio communication option that permits student and faculty to talk to each other. Some newer system are also equipped with two-way video connection also. ITFS can be used in distance education in three ways: (a) providing a closed-circuit network for an institution with multiple locations; (b) feeding programs to a cable company, then to homes; and (c) linking a college or university to business, industry or medial institutions. ITFS differs from standard television broadcasting that must meet a few needs of many audiences simultaneously. ITFS, on the other hand, is narrowcasting that serves need of a very limited audience.

During 1975 through 1978 the Center for Excellence, Inc. conducted a survey of a national sample of ITFS operations in medical or educational services (Curtis,1979). The study found that ITFS systems were making major contributions to six major areas of America's education process. Those areas were:

public schools, private schools, universities, religion-related institutions, social service organizations and medical schools.

In the survey, a majority of the use of ITFS was found to be in the public school systems. The management of the school system felt the ITFS system enabled them to provide educational services which could not otherwise be made available to their student bodies. They felt the ITFS could provide them with the multi-channel services which the school telecommunication system needed. They felt it supplemented their teachers' capabilities. They also felt the ITFS system was an effective communication as well as teaching medium. The ITFS circuits protected the privacy of the school and it made possible the specialized daily-living curricula which students need but which would otherwise not be available. The school system management felt the ITFS systems encouraged the pupils to be creative and it felt the system was a dynamic teaching tool in the classroom. It served the homebound pupil more effectively and at a lower cost than other methodologies. They felt the system could be used to eliminate the pupil's fear of tests. And they felt it was an effective in-service teacher training tool.

Audio Cassette

The use of audio cassettes closely parallels the use of video cassettes as an instructional medium. Audio cassettes give

students the freedom to listen at any time or place and also provides the opportunity to stop, pause or replay and thus organized their study approach accordingly. Cassettes can also be used in combination with visual materials such as slides. Also, instructions on pausing, replaying, answering questions or engaging in activities can be incorporated on the tape by the instructor.

Computer-Assisted Instruction

Computer-assisted instruction is another medium used in instructional telecommunications. Hannafin and Peck (1988) list several advantages to computer-assisted instruction. These include: increased interaction, individualization, motivation, immediate feedback, ease of record keeping, lesson integrity and learner control. Computer assisted instruction is not without its drawbacks. Universities using computer assisted instruction are concerned about the compatibility of software for the many different types of formats available. Other issues that must be addressed before computer-assisted instruction can be more fully utilized include access, integration with course assessment, support and training for tutors.

Teleconference

Audio teleconferencing is a very effective way of linking distant learners to instructors and to one another. The most obvious advantage to telephone conferencing is the immediate

interaction between parties that it makes possible. Many universities offer seminars and individual tutorials through their telephone networks system and new advancements in the technology will bring visual elements into such instruction using freeze-frame or still pictures, compressed video or partial motion and two-way full-motion video.

Teletext

Teletext is simply an electronic data distribution method that use broadcast or cable as the transmission medium. Written materials can be transmitted to the user and recorded on low cost audio cassette recorders. The future of teletext will see it as an interactive medium when two-way cable system are more readily available.

View Data

View data, which is also known as videotext, is an information retrieval system that allows the user access to information stored in a remote computer via the public telephone lines. In addition to being merely a retrieval system, view data can also be used in computer-assisted learning, messaging and conference systems. The advantages to using the universities central computers are initially administrative. The availability of computer-assisted feedback is the main instructional advantage.

Telecourse Design

Instructional Development Process

Instruction in the telecommunication setting requires different preparation than traditional classroom instruction. However, much of the design work remains constant with normal classroom design. One of those constants is the use of an instructional development model that will assist the instructor in course preparation. One such model is a model promoted by Dick and Carey (1985) that they call the systematic design of instruction. Dick and Carey are careful to emphasize the word system in their model. They feel instruction is a systematic process because every component in their model is an interrelated part that all work together toward a defined goal. Each component of Dick and Carey model of instructional design depends on the others for their input and their output. Thus, the justification for the use of the term system.

The many components of Dick and Carey's model are generally broken down into three major stages: analysis, design and evaluation. The analysis stage of the instructional design process is the information gathering stage. The instructional developer first identifies the instructional goal. This goal, a statement as to what the student should be able to do at the completion of the training, is often derived from information

gathered from needs assessments, from practical experience or from an analysis of someone actually performing the work. Following this step, the developer conducts an instructional analysis. This step helps the developer to determine what type of learning is required of the student. This is determined by analyzing subordinate skills that must be learned in order to learn a particular process. The developer then must identify the entry behaviors and characteristics of the student. These include the specific skills the student must have prior to beginning instruction and specific characteristics that may be important to consider in the design of the instruction.

The design stage begins with the familiar step of writing performance objectives. These are based on the instructional analysis and the entry behavior of the student and are specific statements of what the learner will be able to do when they complete the instruction. Following the objectives, the developer then will write criterion-referenced test items. Following the system approach, the test items are based on the previous step of performance objectives. They are assessment items that are parallel to and measure the learner's ability to achieve what was described in the objectives. The next step in the model, developing an instructional strategy, depends on information brought into the process from all previous steps. During this step the developer will determine pre-instructional

activities, presentation of information, practice and feedback, testing, follow-through activities and determine the preferred media to be used to achieve the terminal objective. The final step in this stage is the selection and development of the instruction. Again, this will be based on information derived from the previous step.

The final stage, that of evaluation, begins with designing and conducting the formative evaluation. The formative evaluation is conducted to collect data which are used to identify ways to improve the instruction. This can be done in a one-to-one evaluation, through small group evaluations and through field evaluation. The general purpose of all three is to find ways to improve the instruction before it is presented to the final learners. Although some will say the summative evaluation- -the evaluation conducted after the final instruction has been completed- -is the last step in the model, most will agree that revision of the instruction should be listed as the final step. Not only is the instruction revised at this point in the process, but performance objectives, strategy and media selection can be changed based on the information gathered in the formative evaluation step.

Application to Distance Education

Taking instructional models such as Dick and Carey's and applying them to a distance learning setting calls for some

modification. The complete absence of an instructor or the physical separation of the instructor from the class necessitates the difference in design of telecourses. Kearsley (1985) lists five factors of importance when designing courses and materials for telecommunication. His first point is relevance because any instructional program that is not relevant to the needs of the learner is doomed to certain failure. The lack of relevance is sometimes due to the fact that courses are designed by content experts who fail to properly identify the needs of the learner. These analyses should be conducted by instructional designers or developers who are not content experts.

Motivation of the learner is the second factor. Motivation is broken down further by distinguishing between intrinsic and extrinsic motivation. Intrinsic motivation covers factors that are inherent to the materials - factors such as content relevance, good page or screen design, use of sound and the value of competition. Extrinsic motivation is important because of the fact that the learning done in a telecourse is done in a home or work site and not at a normal classroom. Such surroundings are full of distractions that make learning more difficult. Also, the absence of instructor and peers makes it difficult for the learner to pace himself and attain feedback. An explicit incentive strategy is necessary to insure completion

of such courses. In the academic settings, grades and credit are the explicit incentive and, in the work place, incentives are opportunities for more training, promotions, etc.

Kearsley's third concept is modularization or the breaking up of the content and learning activities into smaller pieces based on the length or function. Modularization allows the learner to skip content that is familiar or of no interest which in turn prevents the loss of interest in the course.

Modularization also makes it easier to tailor the materials to different audiences and to accommodate different level of abilities in the learners.

Learner control is the next factor Kearsley lists. Allowing the learner to control the learning activity includes allowing the learner to control factors such as rate, sequence and level of difficulty. Research has shown that students will not use learner control options unless they are given explicit instructions on how to use them. Therefore, the designer should not only make the controls available to the student but allow for practice of the control devices.

Frequent interruptions are the reason for the next factor in the design of telecourses. Continuity must be provided to a high degree to combat the effects of start-and-stop learning frequently found in telecourses. Continuity can be achieved through modularity, by the frequent use of overviews and

summaries and by the use of a constant graphic design throughout a series of lessons. Interactive media, such as computer-assisted instruction, have an advantage of being able to monitor the progress of the student and record performance and keep track of work completed.

Tryouts and field testing is the final factor Kearsley notes for successful design of telecourse. Because such course are completely self-contained and cannot rely on any interpretation by an instructor, the materials must work well together. The first step in insuring such success is the analysis of needs conducted at the beginning of the process. The other way to insure completeness is through the extensive use of tryouts. Two kinds of evaluation are suggested. Evaluating the instructional effectiveness will tell the designer if the student has learned what was intended. Assessing the attitudinal data will determine if the student liked the instruction and found it worthwhile.

Media

While distance learning can choose from a multitude of media, a great deal of distance learning now is using the medium of television or video. Hudspeth and Brey (1986) feel television is a remarkable medium for delivery of instruction. They go on to explain that educational outcomes are categorized in one of three way. Psychomotor outcomes relate

to physical skills such as typing or welding. Affective outcomes deal with emotional areas such as empathy, respect and joy. The third is cognitive outcome that deals with areas such as problem solving and math. Hudspeth and Brey feel television is best suited for cognitive outcomes because cognitive instruction is involved with thinking skills. The student is expected to understand some relationship or body of knowledge. They feel psychomotor skills can be superficially demonstrated using video or television but in order to properly learn such skills the student needs actual hands-on experience complete with drill and practice and feedback from the instructor. This, of course, is difficult to impossible using most forms of video and television with the one exception of interactive television which does allow for immediate feedback from the instructor. Television also has shortfalls in instructing in the affective domain because educating students to be emotionally responsive typically involves body movement and nonverbal body language. These objectives are usually stated as qualities of feeling or emotional responsiveness. Again, the problem with television and video in such instruction is obvious. Hudspeth and Brey feel television serves to enhance and elaborate the base of cognitive understanding that constitutes the basic goals and objectives of the course. While these goals, objectives and facts and figures are typically found

in print, television serves to illustrate these concepts and to show the dynamic relationships between them.

Faculty and Teaching Strategies

In their discussion of television as the medium of choice for distance learning, Hudspeth and Brey touched on the use of faculty as talent as opposed to using professional talent. They admitted that using professional talent gives one the advantage of knowing how to use the medium to its fullest. They feel professional talent know the body movements, the timing and the microphone techniques much better than most faculty members. However, they feel the advantage to using faculty members as talent is that they provide a true role model and provide visibility to the school. Hudspeth and Brey feels it may be no more difficult to take professional actors and train them to sound like interesting academicians than to take the typical faculty person and train him or her in production techniques.

Hudspeth and Brey mentioned an area of concern dealing with the selection of learning strategies using television. They feel many televised telecourses tend to be passive in the presentation of material and are generally oriented around the basic text. They feel this type of strategy, while effective, can become boring and they list several ways to handle this potential problem. They suggest assigning tasks that require the student to visit the local library. They also feel discussion

groups or supplementary material that represents local interest will help. They also suggest offering field trips as a way to relieve the boredom of straight presentation of facts.

Moore (1987) discusses a similar problem- -that of learner participation. Moore feels many distance education programs are so highly structured they give the student little autonomy. Students must follow precise sequences, may omit very little and can rarely introduce personal experiences. Efforts to overcome this problem include opportunities for students to explore outside the course; to use their own self-discovered learning; and to use their own experiences and sharing them through peer teaching. Moore feels this attempt to support greater learner independence is one of the most important developments in course design in distance education.

When television or video is used in a telecourse, the use of written material is not diminished. The use of the basic text is still fundamental in any telecourse regardless of the medium used. Crane (1987) found that students in telecourses used the printed materials in a variety of ways even though reading the material prior to viewing the program was recommended. Some students found they learned more by reading after viewing. The variety in study habits underscores the importance of developing flexible materials that contribute learning independent of the sequence of the course. Crane's

study suggest that the television experience doesn't replace the reading of the textbook but rather enhances reading. When students were asked which components of the telecourse were of the greatest importance in learning, the textbook was selected most often with television programs a close second.

Moore (1987) agrees with the importance of written materials in telecourses. He feels the structure of the material is important. Written material should be conceived and prepared as an integral part of the course and not added on after the nonprint areas have been decided. Certain kinds of content and instruction are best delivered using the print medium and others are best delivered using non-print and this point must be considered from the very beginning of the course design process.

Armstrong (1986), in the faculty guide to the Televised Interactive Education program at Eastern Iowa Community College, lists several keys to being an effective telecourse instructor. Those keys are: familiarity with one's subject; experience with the type of students likely to take the class; awareness of the ability of audio and visual material to enhance learning; willingness to accept risks and to objectively evaluate one's own performance; strong enough personality to overcome the feeling of isolation remote students can feel; and,

receptive and flexible enough to adapt to styles of teaching which are more successful on television.

This useful faculty guide also lists several helpful teaching tips in using an interactive television system. The first suggestion tells the teacher to originate from all distant sites early in the semester in order to produce a cohesiveness among the students by having them meet the instructor face-to-face early in their interactive television experience. Another suggestion to increase the cohesiveness of the classroom is the suggestion for the instructor to refer to students by their name rather than by their location.

They also suggest that teachers be organized for their classes. Specifically, they should allow for an adequate turn-around time to insure that their hand-outs and other materials are at the remote sites when the teacher needs them. The guide also encourages teachers to plan well for each class session and to try to teach to the objectives that they have previously identified.

During their teaching, the instructors should relax, act naturally and remain flexible. The interactive system does not restrict the teachers ability to teach; it simply reinforces and re-emphasizes what they already know to be effective in the classroom. The guide also encourages teachers to arrange their classroom (within the obvious camera limitations) to best fit

their personal teaching style and methods. The instructor should try not to speak too rapidly when delivering lecture material or answering question over the system for fear that students at remote sites may have difficulty in understanding.

The manual had several suggestions for the instructors that applied to their fear or apprehension of the technology involved. First, they suggest the instructor feel free to move about the classroom and not allow the technology to force them to take root behind the podium. They remind the instructor that teaching comes first and they should not hesitate to ask for technical assistance. The manual specifically tells the instructor that the technology involved can never replicate what they as teachers do in the classroom. Finally, the manual suggests that the teacher be enthusiastic in their delivery then their personality will transcend the medium.

The manual has some very useful suggestions for keeping the students involved in the interactive television process. The first rule is to obtain as much feedback from the students as possible by consciously checking with the students at the remote sites for comments and questions. To increase the level of participation at all sites, the manual suggests that the teachers use cooperative instead of competitive activities with the students. Above all, the manual suggests that instructors conduct their classes with interaction in mind.

The manual ends with this summation for the teachers on their televised interactive system. "You can overcome the physical distance between sites by creating an atmosphere which focuses on the importance of the individual. The great diversity of your students can be utilized to produce positive results. The maintenance of a sense of humor, an air of approachability, and a genuine interest in the student's feedback--will generate group rapport--and pay you substantial dividends." (Armstrong, 1986 PP.26).

Telecourse Students

A discussion on telecommunication would not be complete without mentioning the students involved in such instruction including their attributes, their reasons for learning at a distance and why many of them do not finish their coursework.

There are as many reasons that students learn at a distance as there are reasons that students learn in more standard classroom settings. However, the major reasons given by students in distance learning situations include the ability to work at their own pace. Another reason is an enjoyment of learning alone rather than learning with others. Students in a distance learning situation state they enjoy the access they have to help from the staff of the institution offering the telecourse. This differs from the standard informal self-study

course where the student does not have access to the institution's staff (Feasley, 1983).

There have been many studies to determine the typical distance learner throughout the world. A typical student is difficult to deduce because the results are as varied as the many different programs worldwide. However, some information does seem to be consistent. Those in college-level distance courses are substantially older than their on-campus counterparts with a mean average age of between 30 and 35 years (Feasley, 1983). A majority have also taken previous college courses. Generally, participants in distance education courses are from metropolitan as well as rural areas; employed full- or part-time; unable to attend traditional programs because of restraints of time, location, disability, work or home commitments; unable to afford to attend the traditional college or university; working toward upgrading certification or job qualifications; and/or unable to meet the requirements for entrance into traditional universities or colleges (Faibisoff & Willis, 1987).

They went on to explain that one discrepancy in the studies of distance learner is in the area of minority students. A survey of 11 institutions offering television courses in 1977 observed that the representation of minority groups among enrollees was moderately lower than that of the surrounding

population. However, a larger study of 244 external degree programs throughout the United States showed the student population to be 20 % non-white which is higher than the national average. Another area of discrepancy is in female enrollment in distance education courses. A survey of American and Canadian correspondence courses show slightly more women than men were enrolled. In contrast, a larger percentage of men than women are enrolled in distance education courses in Europe.

The Anenberg/Corporation for Public Broadcasting Project, that funds the development of telecommunication courses in colleges throughout the country, conducted a follow-up survey of students involved in the premiere offerings of the project in 1984 . The results of the survey dispelled many of the misconceptions regarding students in telecourses (Crane, 1987). The study first found that students enrolled in telecourses are usually also enrolled in on-campus courses. This finding dispels the belief that such students are isolated and unfamiliar with campus life. The telecourse students had a high level of motivation with approximately half of the students hoping to achieve a master's or doctoral degree and more than a third hoping to complete a bachelor's degree. Many educators are concerned that telecourses will prove less rigorous than traditional courses and result in lower standards. The study

compared the telecourse with on-campus courses and found the students perceived the telecourses to be as difficult, interesting and challenging as on-campus courses. Loss of control of the learner is another concern of the educator when telecourses are offered. The study found that students in telecourses maintained contact with the institution throughout the course experience. The study also revealed that telecourse students listed the accessibility of the instructor to student either by phone or during office hours as a key ingredient for a successful telecourse. This finding counteracts the misconception that a telecourse eliminates the need for an instructor.

Another important area of study concerning distance learners is that of who is not a distance learner and what is keeping them from becoming one. Generally, the obstacles keeping people from distance learning are broken down in three barriers: the situational barrier; the institutional barrier and the dispositional barrier.

Situational Barriers

Situational barriers stem from the person's most immediate situation and are most generally involve a lack of time and the cost of the course. The problem of having a lack of time to undertake a distance education course is difficult to study because the use of time is as much a question of how one

chooses to use the available time as it is a matter of being too busy to participate. A closer look at the actual life situations reveals that many non-participants in distance education have about the same tasks to perform as those who participate.

Cost is a very difficult barrier to study via the survey method. Many who refer to cost as a barrier do not know the actual cost. Furthermore, willingness to pay is not the same as ability to pay. However, it is clear from the literature that cost is a stronger impediment among women than men and that the lower socio-economic groups stress it more than the higher groups (Rubenson, 1984).

Institutional Barriers

The most generally named institutional barriers is in connection with the college or university program that were originally devised for full-time learners (Cross, 1979). Many of these type of problems have been addressed by the schools making the classes more accessible to working adults by scheduling classes so those working adults can attend. They have also been addressed by granting credit for non-collegiate learning and by creating more flexible admission procedures and developing distance education alternatives.

Dispositional Barriers

Of the three types of barriers to participation in distance learning, dispositional barriers are the most difficult to study.

This is because most people are reluctant to state that their disposition is not toward furthering their education. This was clearly demonstrated in a 1970 study by Wilcox et al. (Cross, 1981). The respondents of this study were asked to not only cite barriers to their own learning but to also speculate on why other adults among their acquaintances did not take part in educational activities. Lack of interest was a leading barrier (26 %) attributed to others. However, fewer than 2 % were willing to admit that lack of interest determined their own participation.

The level of attrition, or students who do not complete distance education courses is a concern of educators. Studies have been conducted to determine the number of those who do not finish and the reasons why in an effort to determine ways to improve the usually high attrition rate of distance learners. There are two ways of determining the completion rate of distance learners. The first is to calculate completions as the percentage of all students who enroll in the course. The other method deducts the number of students who do not complete at least one assignment (no-starts) from the total enrollees before calculating the percentage of completion. In a comparison of the ranges of data from these two formulas, nonstarting students comprised 17 to 24 % of distance students (Coldeway & Spencer, 1980).

The existing research points to the fact that students complete distance education courses less often than their counterparts finish classroom-based one. Research on the completion rate of students in distance education courses vary from 10 to 70 % while those in the classroom setting complete their courses anywhere from 50 to 85 % of the time. However, many administrators feel these completion figures can be improved. They feel students will be more likely to finish the course if they study at a steady rate. They also feel that regular pace of study will be more easily attained if the institution itself sets the pace. In a comparative study of completion rates in identical courses given on a self-paced basis versus on a semester schedule of date, a regular rate of study was shown to have a positive effect on completing the course (Coldeway, 1982).

Two experimental studies conducted at the same institution proved the importance of the role the school can play in assisting the student to complete their course work. In the first study, students who had not submitted an assignment in the previous month were sent an encouraging post card and then letters at one month intervals. The response rate for this experimental group was 46 % versus 31 % for the control group. In the second study, the turnaround time for assignments (the time it takes for an assignment to go from the

student to the grader and come back to the student) was reduced from a median of 8.3 days to 5.6 days in the experimental group. This resulted in an increase in completion rates from 69 to 91 % (Rekkedal, 1982).

Another area of concern with students in a distance education setting is the performance of the student or how well they learn in this setting in comparison to the student in the conventional classroom. There have been many studies on this subject and the most reliable studies indicate there is no significant difference between students in a distance education setting and those in the classroom (Zigerell, 1984). Some studies that indicate that distance students may actually perform higher than their classroom counterparts. However, in these situations it is likely that highly motivated adult distance learners are being compared with significantly younger groups on campus

The same type of findings are apparent in the industrial training field. In a paper on teletraining courses given to sales personnel at AT&T, Chute (1984) stated there is no significant difference between the amount students learn in classes that are teletrained and the amount learned in face-to-face classes. The training provided to the sales staff was originally presented in a classroom setting and studies showed the average pretest score of 16.82 and a posttest score of 24.64.

The same type of material presented in a teletraining format showed an average pretest score of 18.55 and posttest score of 28.55. In addition, the studies have shown an outstanding level of acceptance by the students in the teletraining programs.

CHAPTER 3

SUMMARY AND CONCLUSIONS

As with many other aspects of media-related fields, the field of instructional telecommunications could benefit from a consensus of definitions of key terms applying to the field. Many times the terms of distance learning, correspondence study and instructional telecommunications are used synonymously. This has contributed to the confusion in the field. In order to clarify this particular situation, the term distance learning should be used to denote any situation in which the learner is not in the same immediate geographic location as the instructor. This would take into account correspondence courses using only the written word as well as courses using technological devices to achieve interaction between student and instructor. The use of the phrase correspondence study courses should be used only for distance learning situations that do not include any technological device for interaction between the instructor and learner. An example of this would be the conventional correspondence course that includes a textbook, a study manual and tests that the learner must complete on their own time at their own convenience. Finally, the term instructional telecommunications should be reserved for distance learning situations that used one or more

technological devices as a channel to allow immediate interaction between the student and the instructor

During the early days of instructional telecommunications, the predominant media used to transmit instruction were audio oriented such as radio, telephone and audio cassette. While there is certainly a place for these media to be used in current and future instructional telecommunications, it is clear that the dominant media for the future of instructional telecommunications will be visually oriented. Television and video are and will certainly continue to be the media of choice for education and industry. The reasons for this are many and clear. The average distance learner, by virtue of his or her membership in their particular generation, grew up with the television set. Their leisure hours were spent mostly watching television. Many even studied and did homework with their constant companion, television. This relationship with television went far beyond the mere point of familiarity. Studies that show the average American home with a television on for anywhere from seven to ten hours per day prove that point. It is only logical then that television and video would be the media most popular and effective for instructional telecommunications.

Most of the concern about television or video as an effective media for instructional telecommunication should be

laid to rest with the many studies that have shown that the average distance learner learns as well and sometimes better using television. It should be noted that the average distance learner has a much higher degree of interest and motivation than average secondary student. This difference is a very important factor in this type of research findings. The effectiveness of television in a secondary educational situation would be much less than in a situation made up of mature and highly motivated adult learners.

Even with the properly motivated student, instruction for instructional telecommunications must be designed differently than conventional classroom instruction. The course designers must be aware of the many different factors inherent in a system where instructor and learner are physically separated. Designing a telecourse without this knowledge and like a conventional classroom instruction is inviting failure.

The use of instructional telecommunication will be a critical factor in the survival of many post-secondary institutions in the years to come. With the size of the traditional age college student falling in size each year, with the increasing need for continuing education and with the concept of lifelong learning, colleges and universities have and will continue to need to appeal to the nontraditional age student. Distance learning, especially instructional telecommunications,

will appeal to this group because it will make their continuing education more accessible. This increased use of instructional telecommunications also gives these schools the responsibility to use the technology effectively and efficiently. Therefore, these colleges and universities should lead the way in the research of proper and effective uses of telecourses including course design and instructor preparation.

REFERENCES

- Armstrong, J. (1986). Faculty guide to TIE (Televised Interactive Education) Bettendorf, Iowa: Eastern Iowa Community College.
- Baggaley, J., & Duck, S. (1977). Guidelines in ETV production: Six experiments" In Evaluating educational television and radio, by A. W. Bates and John Robinson.
- Baldwin, T., & McVoy, D. (1983). Cable communications. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Coldeway, D., & Spencer, R. (1980). The measurement of attrition and completion of distance learning courses. Edmonton, Alberta: Athabasca University.
- Coldeway, D. (1982). Recent research in distance learning" In Learning at a distance: A world perspective, edited by John S. Daniel, Martha A. Stroud and John R. Thompson. Edmonton, Alberta: Athabasca University.
- Crane, V. (1987, October-November). Countering misconceptions American Association for Community and Junior Colleges, p. 36 & 37.
- Cross, P. (1981). Adult learners: Characteristics, needs and interests In Lifelong learning in America, Edited by R.E. Peterson. San Francisco: Jossey Bass.
- Curtis, J. (1979). Instructional television fixed service: A most valuable educational resource" In Educational telecommunications delivery systems edited by John A. Curtis, and Joseph M. Biedenbach, Washington, D.C. : American Society for Engineering Education.
- Desruisseau, P. (1982, December). National Teleconference Network to Link 66 Colleges This Week Chronicles of Higher Education.
- Dick, W., & Carey, L. (1985). The systematic design of instruction. Glenview, Illinois: Scott Foresman and Company.
- Dirr, P., & Pedone, R. (1980). Higher education utilization study. Washington, D.C.: Corporation for Public Broadcasting.

- Fabisoff, S., & Willis, D. (1987, Spring). Distance education: Definition and overview Journal of Education For Library and Information Science.
- Feasley, C. (1983). Serving learners at a distance: A guide to program practices. Washington, D. C.: Association for the Study of Higher Education.
- Gibbons, J., Kincheloe, W., & Down, K. (1977, March 18). Tutored videotape instruction: A new use of electronics media in education. Science, p. 1139-46.
- Hamblin, B. (1982). Interactive video law seminars. In Teleconferencing and electronic communications, edited by L.A. Parker and C. H. Olgren, Madison, Wisconsin:University of Wisconsin Extension.
- Hannifin, M., & Peck, K. (1988). The design, development and evaluation of instructional software. New York:Macmillan Publishing Company.
- Hudspeth, D., & Brey, R. (1986). Instructional telecommunications: Principles and applications. New York: Praeger Publishers.
- Kearsley, G. (1985). Training for tomorrow : Distributed learning through computers and communications technology. Reading, Mass.:Addison Publishing Company, Inc.
- Lewis, R. (1983). Meetings learner's needs through telecommunications: A directory and guide to programs. Washington, D. C.:American Association for Higher Education.
- Lipson, J. (1977, September/October). Technology and adult education: A report on the university of mid-America experiment Technological Horizons in Education Journal.
- Miller, P. (1982). "Participatory television: Education and interactive cable TV" In Teleconferencing an electronic communications edited by L. . Parker and C. H. Olgren, Madison, Wisconsin: Universtiy of Wisconsin Extension.
- Munshi, K. (1980). Telecourse reflections '80 Washington, D. C.: Corporation for Public Broadcasting.
- Moore, M. (1987, September). University distance education TechTrends, p. 13-18.

- Rekkedal, T. (1982). The dropout problem and what to do about it. In Learning at a distance: A world perspective edited by John S. Daniel, Martha A. Stroud and John R. Thompson, Vancouver, B.C.: Educational Research Institute of British Columbia.
- Rubenson, K. (1984). Distance education for adults: Old and new barriers for participation. In Distance higher education and the adult learner edited by Ger van Enkevort, Keith Harry, Pierre Morin and Hans G. Schutze, The Netherlands: Van Gorcum, Assen.
- Ruggles, R. (1982). Learning at a distance and the new technology, Vancouver, B. C.: Educational Research Institute of British Columbia.
- Wood,D., & Wylie, D. (1977). Educational telecommunication, Belmont, California:Wadsworth Publishing Company.
- Zigerell, J. (1984). Distance education: An information age approach to adult education, Columbus, Ohio:National Center Publications, National Center for Research in Vocational Education.