A CASE STUDY OF BASIC ENGLISH AND READING: A TELECOMMUNICATIONS-BASED DISTANCE EDUCATION COURSE

By

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Bachelor of Science

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Stillwater, Oklahoma

1988

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
May, 1994

OKLAHOMA STATE UNIVERSITY

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ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my major advisor, Dr. Connie Martin for her intelligent supervision, constructive guidance, inspiration and endurance throughout this process. My sincere appreciation extends to my other committee members Dr. Charles Fleming and Dr. Maureen Nemecek whose guidance and assistance are also invaluable.

More over, I wish to extend a very special thank you to Dr. Joyce Nichols whose time and information was vital to this thesis process. I also wish to thank Beverly Nichols, Dr. Smith Holt and Leigh Fisher for participating in the information gathering process.

I would like to give my special appreciation and undying gratitude to my entire family, especially my parents Harold and Gloria Merideth, for their love and never ending support throughout this very long process.

Thanks also go to my very special friends, Brian Inbody and Jacqueline Bender for their undying support, friendship and special care throughout the writing of this paper.

And finally, I wish to extend a special thanks to Chuck Colby, Trisha Kerkstra, Walt Mauer, Paul Geissen and the entire Housing and Dining staff at The University of Tulsa. With thanks also to my friends Lynda Hyman and Tamara Haub at Oklahoma State University. To all of the special people in my life, mentioned and unmentioned, I say Thank You! Without everyone's support, the completion of this paper would not have been possible.

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CHAPTER I

INTRODUCTION

The following is a descriptive case study that focuses on one elementary-grade distance education program that utilized live television broadcasts, transmitted by satellite, supplemented by other forms of instructional technology to teach "Basic English and Reading" to students nation-wide. The "Basic English and Reading" course was one program offered by the Arts and Sciences Teleconferencing Service (ASTS) of Oklahoma State University (OSU). The study is descriptive and is designed to inform rather than draw conclusions regarding the potential and effectiveness of distance education in general, or in specific relation to the subject matter and audience of the program under study. This research provides a written documentation of the history and characteristics of one specific distance education program. As such, it stands as one piece in a mosaic which depicts the use being made of telecommunications to serve the needs of the education community, particularly at the elementary- and secondary-school levels. The detail provided in a case study offers an in-depth and comprehensive view of the subject. In this case, it can help other distance education providers in the design and administration of their programs, and it can contribute to a recording of the history of the twentieth-century movement to use telecommunications to increase access to and improve the quality of education.

Background of the Problem

Small and rural schools have suffered throughout the years from an inability to offer their students the wide variety of courses which larger schools have typically provided. The small number of students in the typical rural school has provided a budget which could not accommodate specialized course offerings, such as advanced-placement

science and mathematics courses. In other cases, even with available funds, rural schools found they could not attract to their locales teachers with the qualifications to teach such specialized courses, or to teach other courses for which there is a shortage of certified teachers--e.g., foreign languages.

Technology-related solutions to the problem in the past have included videotape instruction and other forms of one-way television broadcasts linking a teacher with students at remote sites. The advent of telecommunications technologies provided the means to make the communication live and to achieve two-way communication--either through a strictly audio interaction between a live, television-broadcasting teacher and the students at an unlimited number of remote sites or through two-way video and audio communication linking the teacher and students at a more limited number of remote sites, typically one to twenty.

The practitioners who are involved in the design and delivery of the variety of television-based and telecommunications-based courses and other educational programs which have proliferated in the past twenty years have typically provided very little description of their programs in the written literature that is available to researchers. It is difficult to find information that is more than mere listings of such programs, sometimes with a description of the technology being used and the number of sites and students being served. However, the programs are not described in detail and so it is difficult to understand how the contact between teacher and students is maintained, what the television portions of the programs look like, what the costs of developing and operating the courses are, how participation of schools and students has fared over time, what the concrete difficulties of offering instruction at a distance are.

Purpose of the Study

Documenting and providing information for future researchers and practitioners on one particular telecommunications-based education course is the main objective of this case study. The course selected for the study, "Basic English and Reading" for students in

grades 7 and 8, has been recognized as a pioneer in using an innovative teaching design and telecommunications technology to reach educationally disadvantaged youth.

Areas To Be Investigated

This case study will focus on one specific course within a university distance education delivery service. The areas to be investigated within the course will include the following:

- Funding
- Curriculum
- Learning Objectives
- Course Design
- Administrative Functions
- Technological Aspects

Importance of the Study

This study, in addition to providing a written record of the development and delivery of a pioneering telecommunications-based course, provides information which can be used by other distance education providers as they seek the most efficient and effective means of delivering instruction through this method. It also provides information useful to researchers tracing the development of telecommunications applications, particularly those in education, and to researchers attempting to assess the effectiveness of distance education.

Scope and Limitations of the Study

The focus of this study was an in-depth description of the "Basic English And Reading" (BEAR) course, including its use of satellite broadcasts and television productions, its use of personal computers and instructional software in the course design, the utilization of text books and other printed materials, the systems in place that provided continuing support to the students and the teachers at the remote sites who participated in

the course, and the administrative and financial underpinnings of the program. In addition, this case study described the principal organizations that contributed to the creation and delivery of the course and that provided the context within which the course operated.

The information gathered for this case study was confined to the printed materials which currently exist and which were made available to the researcher and to the recollections of the five key people involved with the design and operation of the course. As of this writing, the course is no longer offered by Oklahoma State University; the teacher of the course has retired; and the manager of the Arts and Sciences Teleconferencing Services is no longer employed with Oklahoma State University. The documentation provided by this study would not be easily replicated in the future because of these departures.

This case study provides information on only one example of the use of telecommunications to deliver instruction to students at remote sites. It is specific to a particular subject matter and target audience. As such, it is not necessarily representative of other courses which are delivered via telecommunications.

Outline of the Remainder of the Thesis

The remainder of this thesis is separated into four chapters. Chapter 2 reviews the literature that pertains to the history of distance learning. Chapter 3 describes the methodology used to collect and organize the information on the "Basic English and Reading" course. Chapter 4 presents the findings of the research into the "Basic English and Reading" course from the time of its development until its cancellation. Chapter 5 provides a brief summary of the findings and discusses their significance. It also suggests further research that might be conducted in the area of distance education.

CHAPTER II

ORGANIZATION OF THE CHAPTER

This chapter provides a review of the literature pertaining to distance education and the use of television and computers to deliver instruction to students who are separated in space, and often in time, from the teacher and from each other. The chapter begins with a brief definition and history of distance education from the early years of correspondence education through the adoption of the distance education nomenclature and philosophy. This history also references similar case studies that have been conducted within the past ten years.

The next section of the chapter provides a brief history of the use of television in education and traces the evolution of this use to the present-day form of two-way video and audio communication made possible by advances in telecommunications technologies. This history also includes examples of educational television systems and courses and how they have been used in the classroom in the past ten years.

The next section of this chapter discusses the use of computer technology in distance education. The information on the use of computers focuses on the way computers are used within the curriculum of distance education and not on the technology itself. The final section of this chapter discusses the need for this study.

Use of Television in Instruction

History. The first instance of the use of the medium of television to provide instruction to students who were remote from the source of the instruction, i.e., from the teacher, occurred in the 1930s when the State University of Iowa was involved with

technical experiments with visual broadcasting. The broadcasts contained material from various departments on campus. Educational broadcasts to children did not come about until 1948-49 in the Philadelphia public schools using commercial stations. Both of these early educational broadcasts were small in scale compared to what educational television (ETV) grew to be. The following list of ETV's advancements through the 1950s to 1960 is taken from Using Television in the Classroom, edited by Mary Howard Smith (Smith, 1961, pp. 10-12).

- The first station licensed to an educational institution was WOIT at Iowa State College in 1950.
- In Louisville, Kentucky a commercial station offered a televised correspondence course in 1950.
- Western Reserve University began producing courses for university credit over the commercial station in Cleveland in 1951.
- A full day of regular lessons to 13 schools in two communities from Mount Clair State College were broadcast in New Jersey in 1952.
- The FCC reserved approximately 250 channels for non-commercial, educational use in 1953.
- In 1953 KUHT, in Houston,Texas, was the first ETV station to go on the air.
- Chicago Board of Education launched the Chicago Junior College experiment which offered on television a complete junior college course leading to an Associate of Arts degree.
- The first large scale experiment in ETV occurred in 1956. Elementary and secondary schools in Hagerstown, Maryland were linked by a closed circuit television system and several programs were telecast simultaneously in various subjects and grade levels.
- The Fund for the Advancement of Education initiated the National Program in the Use of Television in Public Schools in 1957. Initially 11 cities and 3 states participated in a study of teaching large classes by television.
- In 1960 the National Program in the Use of Television in Public Schools expanded to include 90-600 pupils in 15 cities in 3 states.

Between 1960 and 1967 ETV stations kept growing in number and eventually needed a governing board. In 1967 the Corporation for Public Broadcasting (CPB) was created by the United States Congress. The CPB's main purpose was to distribute money to government-supported stations across the country. The CPB later created the Public

Broadcasting Service (PBS) and National Public Radio (NPR). The CPB is still the controlling body of PBS and NPR in the United States (Smith, 1961, pp. 12-20).

In the late 1960s and early 1970s, the British Open University started offering distance education courses involving television, radio, and other available electronic media delivery methods. Garrison (1989) described the focus of the Open University:

> "The British Open University was unique in many ways. It was the first large-scale public correspondence education organisation. Indicative of the importance of using new media, the British Open University originally was to be called the University of the Air" (Garrison, 1989, p.58).

Perry (1977) states that "the Open University concept was the key to providing opportunities for higher education through a multi-media system that harnessed educational broadcasting to correspondence teaching and other methods" (Perry, 1977, p. 9). According to Garrison (1989), over twenty universities around the world are now modeled upon the British Open University (p.58).

With the establishment of universities such as the British Open University and further developments in the capabilities and reach of television, broadcast television became just one of the many ways to deliver educational programming.

Effectiveness. Effectiveness studies on teaching by television have been conducted for many years. Early studies in the 1960s showed that television is an effective tool for teaching either groups of students in a classroom situation or individual students working independently. Studies in the 1980s have reaffirmed the results of the research conducted in the 1960s. In 1961 the Midwest Council on Airborne Television Instruction published a book on using television in the classroom and under the topic of television research it stated, "students taught by television learned content as well as or better than these taught without it. This was true whether the telecast was received in large classes or in the traditional self contained classroom of about thirty" (Smith, 1961, p. 10). The study also mentioned that students who failed a television course would most likely also fail in a traditional classroom setting.

Peter Wisner (1987) wrote, "Most studies indicate that television can match classroom-based instruction in terms of measurable learning outcomes and student attitudes" (Niemi and Gouler, 1987, p.12). Most research reports do not say that television courses are better because of the use of television as a medium. Rather, the reports usually note that there is no difference between the learning level or the attitudes of the students.

Rationale Supporting the Use of Television for Instruction. The rationale behind the use of television to provide instruction is its capacity to reach out with educational programming to students who might not otherwise be reached. Students confined to their homes would be severely restricted in the education they could receive without the availability of correspondence study or distance education. Television also makes it possible for smaller and rural schools to expand the curriculum they can provide to their students--when they do not have the funds to hire a teacher to provide specialized courses or when they can not attract a qualified teacher to their area. The Midwest Council on Airborne Television Instruction contends that television instruction, ". . . can be used in many ways to help meet the modern education problems posed by the necessity to educate more people better and faster with proportionally fewer teachers" (1961, p.4).

Peter Wisner, in a book compiled by Niemi and Gouler (1987), argues in favor of the use of television to provide instruction. Wisner contends that television has often been used as a "stop-gap" measure for a school system that has a teacher or classroom shortage, and that the technology is at least the second-best way (face-to-face being the first) to present instruction in marginal situations outside the classroom. According to Wisner, "television's strong point is making education possible in marginal situations" (Niemi and Gouler, 1987, p.12). Television can make a significant difference to a school and to individual students when it is used to deliver instruction to a number of students when a traditional classroom setting is not available.

Use of Computers in Instruction

History. The first instructional use of computers occurred at the University of Illinois in 1960 (Verduin and Clark, 1991, p. 75). The system was a mainframe with student terminals connected via telephone lines. The system was called Programmed Logic for Automatic Teaching Operation (PLATO) and it was designed to help students prepare for the ABE/GED test. The PLATO system was designed to allow many users to access the mainframe at the same time. The PLATO system had the capabilities of "videodisc players, slide projectors, and speech synthesizers that may be activated at the appropriate time in instructional sessions by the central computer" (Verduin and Clark, 1991, p. 75). The PLATO was a Computer Assisted Instruction system.

Kaufman (1986) divides computer instruction into two forms for distance education: Transmitted Mode (on-line) and Local Mode (off-line) (Garrison, 1989, p.81). The Transmitted Mode is described as a tool by which information is transmitted between computers via a telecommunications network. When this process is applied to distance education, the computer used in the Transmitted Mode is both an information processor and a communication link between teacher and student. Garrison (1987) lists four basic functions of the Transmitted Mode:

Computer Conferencing consists of three or more people exchanging ideas via their own personal computer and telephone modem. Messages are transmitted in written form and there are varying lengths of delays between messages.

Electronic Mail (E-Mail) is an individual method of communication. "Messages and information may be transmitted between teacher and student or between student and student in an asynchronous manner" (Garrison, p. 80).

Electronic Data Bases are a one-way dialogue from computer to student; an educational transaction does not occur by simply accessing information in a data base.

Administrative Function is a way to create and update course curriculum (Garrison, pp. 78-80).

Computer-Assisted Instruction (CAI) "involves the use of the computer as a teaching machine" (Verduin and Clark, 1991, p. 74). The CAI system is designed to present an educational lesson and the student interacts with the instructional lesson. The CAI system is a question and answer program. The student proceeds through a series of questions and is given a chance to answer the questions. After a question is answered, the computer shows the student the correct answer to the question. The CAI system would be considered a Transmitted Mode.

The Local Mode, as Kaufman (1986) describes it, will be a real breakthrough in distance education when the computer is used as a stand-alone system to provide direct instruction. The Local Mode system will be able to provide the educational evaluation as well as the instruction and tutorial processes. Young (1987) states, "The characteristics of how individualised instruction includes the individualisation of how much instruction receives, of pacing, of reorganisation of course sequence, of rate and frequency of feedback, and of internal learning activities" (Garrison, 1989, p.81).

Computer-Managed Instruction (CMI) is similar to the Local Mode except that learning does not take place. The CMI differs from the CAI in that there is no direct interaction between the computer and the learner. CMI is "the use of a computer in education not instruction, but for recording the progress of a student through a learning sequence, prescribing lessons for the student, grading tests, scheduling non-computer learning experiences and making all this data available to both the student and the teacher" (Association for Educational Communications and Technology, 1979, p.175).

Effectiveness. As discussed earlier, the PLATO system is a system that has proven its effectiveness. "Rachal (1984) reviewed studies in which PLATO was used.... Most of the studies showed students using PLATO outperforming students using conventional learning methods..." (Verduin and Clark, 1991, p. 76).

Another example of the effectiveness of computer systems as a distance education technology is an English class that uses a computer with a modem to communicate with Europe via E-Mail. Students in the English class can send a message to any location equipped with a modem and system similar to theirs. Rosemary Potter, the teacher of the course and author of the report, lists four areas where the telecommunication process was effective in her class. These four areas are: Telecommunications Motivates Reading Instruction, Telecommunications Develops Confidence, Telecommunications Fosters Fervor for Reading, and Telecommunications Empowers Students. Each of these effects was proven through the achievement of the learner outcomes and the attitude of the students in the course (Potter, 1992, pp. 1-5).

Distance Education

Definition. Since the beginning of research on distance education, there have been a host of definitions and lists of the essential, defining characteristics of distance education suggested by various researchers and practitioners. For example, Holmberg defines distance education as:

> "The various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance, and tuition of a tutorial organization" (Holmberg, 1977, p.9).

Moore uses part of Holmberg's definition of the separation of teacher and student, but focuses more on the technological aspect. According to Moore (1973, p.664),

> "Distance teaching may be defined as the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in a contiguous situation would be performed in the learning presence, so

that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices" (Holmberg, 1977, p.9)

Examining these two definitions and others, Desmond Keegan produced a descriptive definition consisting of seven components. The following is Keegan's (1986) descriptive definition of distance education:

- the quasi-permanent separation of teacher and learner throughout the length of the learning process; this distinguishes it from conventional face-to-face education.
- the influence of an educational organisation both in the planning and preparation of learning materials and in the provision of it from private study to teach-yourself programmes.
- the use of technical media; print, audio, video or computer, to unite teacher and learner to carry the content of the course.
- the provision of two-way communication so that the student may benefit from or even initiate dialogue; this distinguishes it from other uses of technology in education.
- the quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in groups, with the possibility of occasional meetings for both didactic and socialisation purposes.
- the presence of more industrialised features than in conventional oral education.
- the privatisation of institutional learning. (Keegan,1986, pp.49-50)

D. R. Garrison explains that Keegan believes that his definition covers the middle ground of the extremes in distance education theories. Garrison disagrees that Keegan's definition covers the middle ground because it closely describes a correspondence perspective and is too narrow to cover all aspects (Garrison, 1989, p. 5).

The definitions of Holmberg, Moore and Keegan all include the separation factor and individualized learning as part of the definition. For the purpose of this case study and primarily this chapter, the most basic definition of distance education will be used. Garrison notes that "every attempt to define distance education refers to the separation of teacher and student..." (Garrison, 1989, p. 2). Distance education or correspondence study is characterized by a student learning material while separated from the teacher or instructor of the course. Even though this case study is focused on the physical separation

of teacher and student who are joined together via technology, correspondence education will be briefly mentioned because it was the precursor of the newest forms of distance education.

Early Forms of Distance Education Courses

The first recognized form of education at a distance was conducted through the medium of newsprint. On March 20, 1728, in an advertisement printed in "The Boston Gazette," Correspondence Education or what is now called Distance Education was born. On that day Caleb Pilipps, a teacher of the "New Method of Short Hand" advertised that, "any persons in the country desirous to learn this art, may by having the several lessons sent weekly to them, be as perfectly instructed as those that live in Boston" (Holmberg, 1986, p. 6). Battenberg (1971) mentions this early form of correspondence education was more of a self-teaching system rather than two-way communication between the teacher and the student. Caleb Philipps' method of disseminating information was set up such that the student sent in information and money for the course and then materials were sent to the student on a weekly basis. There is no mention of Philipps and the student exchanging information or conversation (Holmberg, 1986, p. 6).

The next recognized correspondence education offering came over one hundred years after Philipps' short hand course. Bratt (1977) notes the publication "Lunds Weckoblad, No. 30, 1833, a weekly published in the old Swedish university city of Lund, offers ladies and gentlemen an opportunity to study composition through the medium of the Post" (Holmberg, 1986, p. 7). Once again there is the transmission of information to the student through a medium, but no interaction between the student and the instructor.

Another attempt at distance education was made in England in 1840 by "Isaac Pitman who reduced the main principles of his shorthand system to fit into postcards. He sent these to students, who were invited to transcribe into shorthand passages short passages of the bible and send the transcription to him for correction." (Holmberg, 1986,

p. 7). This system of distance education took place when the uniform penny postage was introduced. This system was to later become the "Sir Isaac Pitman Correspondence Colleges" (Holmberg, 1986). This is the first evidence of interaction between teacher and student.

D. R. Garrison referred to MacKenzie and Christensen, 1971, stated that William Rainey Harper has been named as the "father of distance education" (Garrison, 1989, p. 51). Harper received this title because of his development of the "Correspondence School of Hebrew" and his role in establishing the correspondence program at the Chautauqua University. Rainey later became the president of the University of Chicago where he established the first university correspondence program in the 'Extension Division' (Garrison, 1989). Holmberg (1986) gives a brief description of the format Harper used at the University of Chicago (p. 18). The three parts of the correspondence courses involved (1) the instruction sheet which the student had to complete before being able to start, (2) the examination paper, which was included in the instruction sheet. The final part of the lesson was the completion of (3) the recitation paper which was sent to the instructor for evaluation, correction and suggestions and then returned to the student for review. This method of instruction involves two-way interaction between the teacher and student in the teaching and learning process. The medium in this situation is the mail and the form is written, but two-way interaction does exist. This structure laid the groundwork for the further developments in correspondence education via some interactive electronic medium.

K. E. Young notes that "while formal correspondence education courses were initiated in Europe during the nineteenth century, the most significant early developments in correspondence education took place in the United States" (Young, 1984, p. 12). Young (1984) also notes that "by 1910, there were more than 200 correspondence schools in the United States" (p.13). Holmberg (1986) states "From the beginnings...a steady expansion of distance education occurred until around 1970 without any general radical change in

organisational structure, but with gradually more sophisticated methods and media...(p. 29).

In 1982 the term distance education was formally adopted to replace the correspondence study name that had been given to distance education. "A degree of formal recognition of the term distance education occurred in 1982 when the International Council for Correspondence Education (ICCE) changed its name to the International Council for Distance Education" (Holmberg, 1989, p.2).

The history of distance education is more detailed than what is listed above, but for the purpose of this study the groundwork has been laid for understanding the origins of the modern-day distance education movement which has evolved from transmission via postage stamp to transmission via electronic media. The introduction of the electronic media was intended to reduce the amount of time that elapsed between the exchanges from teacher-to-student and student-to-teacher.

Later Forms of Correspondence

Radio. The introduction of radio into distance education occurred in the 1920s. Radio initiated the use of the electronic media in the learning process. Where the postage stamp spurred written interaction between the teacher, radio introduced a way of interacting with the student via voice transmission. Although radio is known as an "ancillary media" or one-way communication, its use to reach the student orally could eliminate the step of sending materials weekly to the student via the mail. The student could receive the materials for the entire course at the beginning, wait for the intended broadcast of the lesson, complete the exercises for that section of the course and return the information to the instructor for evaluation through the mail. This opened a new era in distance education.

In the 1920s more than 200 educational radio stations were on the air. Almost all of the radio stations that had been established were off the air by 1930 (Sterling and Kittross, 1990, p. 158). Radio, despite its benefits, still did not provide for live interaction and

many of the disadvantages of the geographical separation of teacher and learner remained. In one sense the student had more control because the information could be heard when the broadcast was given or the broadcast could be recorded and heard at the student's leisure. According to Sterling and Kittross (1990), "Since the possible benefits from using radio as a teacher were not recognized at first, preference was given to traditional teaching methods, money went in other budgetary directions, particularly because there were not enough trained and interested personnel and support from college and university administrations" (p. 111) This was only one factor contributing to the demise of radio education. "Their problem began in 1925 mainly because of financial pressures on schools increasing greatly during the depression, school administrators' indecision and lack of purpose and interest and share-time commercial broadcasters' efforts to gain air time and stifle competition for listeners. Under this load educational stations dropped out at an increasing rate after 1926" (Sterling and Kittross, 1990, pg. 111).

In 1927 through 1933 the number of radio stations carrying educational programming dropped from ninety-eight to forty-three. Part of the reduction was due to the increasing technical improvements that needed to be made to meet the Federal Radio Commission (FRC) requirements. In 1929 a new committee, the Advisory Committee on Education by Radio, was founded that brought new hope to the dying educational radio industry. (Sterling and Kittross, 1990, 111). The advisory committee did not last and eventually died by 1930 without having had much effect. Two more committees were formed to help this form of broadcast education, but like the Advisory Committee on Education by Radio, they had little to no effect.

In 1929 some hope was regenerated for the bleak future of educational radio. "The Payne fund supported daily Ohio School of the Air broadcasts on commercial station WLW for in-school listening" (Sterling and Kittross, 1990, 112) The first college radio station carried instructional programs with teacher guidelines and student materials. The Ohio

State Legislature appropriated money for the production of the course that was carried on WOSU.

In 1931 another university carried a program similar to that of WOSU. An educational series for below-college classroom listening was presented on Wisconsin School of the Air on the college owned station WHA. There is no record of the course having any materials prepared for the pupils or teachers.

Between the years of 1927 and 1933 educational radio was at its peak, and even the 1941 order of the Federal Communications Commission providing for the expansion of educational stations on the FM band could not revive the expansion of educational radio. During 1941 the number of radio stations had been reduced to 35, and today only 25 stations remain on the air (Sterling and Kittross, 1990, p.112).

Recorded Audio and Video Technologies

The following delivery technologies are taken from the Niemi and Gooler book, Technologies for Learning Outside the Classroom and the United States Congress: Office of Technology Assesment book titled, Linking for Learning.

Audiocassette. The audiocassette technology is somewhat simple compared to the other technologies available to distance education. The audiocassette is constructed with audio tape enclosed inside a plastic case. The tape inside the cassette is able to be recorded on and replayed at the user's request. The audio tape consists of particles that are magnetically arranged to make the sounds when it is replayed. The only equipment required to use an audiocassette is an audiocassette recorder and player which are functions enclosed in one machine. Audiocassettes are a one-way form of distance education. There is no other function of the audiocassette than to listen to the recording and possibly record some answers and send it to the instructor. The audiocassette is versatile because it can be

used to record information from other distance education technologies. For example, if there were a weekly educational radio broadcast it could be recorded for later reference use.

Videocassette. The videocassette works on the same principle as the audiocassette except that the videocassette has a video track included in the package. The video track on the tape is created exactly as the audiocassette is. The videocassette is useful in sending entire courses to individuals or classes. They are a one-way source of information and require a Videocassette Player (VCP) and a television monitor to replay and view the material.

Forms Which Include Live Television Instruction. Telecommunication technologies make it possible to deliver information directly from the source of the instruction to the students participating in a distance education course. These technologies range from one-way communication where the student has no direct interaction with the instructor, to two-way communication with direct interaction by the students back to the instructor. Radio, telephone, and broadcast television have laid the groundwork for the more sophisticated and pinpointed communications possible in today's forms of distance education. The older technologies are still being used in the new systems, but are made more effective in combination with the newer forms of communication. In this section, distance education technologies will be described on the basis of how they work as stand-alone technologies.

Live Delivery Technologies

Audio Only

Radio. As discussed earlier, radio had a widespread though not long-lived impact in the early years of distance education. Radio is a point-to-multipoint technology that requires an omni-directional transmitting tower that can range in power. The tower sends a

signal that can be received by a common household radio receiver. The transmitter sends a signal that, depending on the frequency of the signal, determines the channel through which the information can be received. Radio is a one-way form of delivering distance education. The telephone can serve as an interactive communication medium for the teacher and student to communicate directly with one another.

Audio and Video

Broadcast Television. Broadcast television is a system of combining audio and video signals transmitted from a central location in the community it serves. Broadcast television can be received by anyone with a television receiver within the transmitting area. Transmitting areas can vary depending on the amount of power being sent to the transmitting tower. A transmitting tower is required to send a broadcast television signal. The tower sends an omni-directional signal (all direction signal not aimed at any specific receiving site) and the frequency of the signal dictates the television channel on which the signal is received. The receiving of this omni-directional signal can be affected by the terrain surrounding the receiving area. Broadcast television does not inherently offer interaction between teacher and student unless linked with an interactive technology.

Broadcast television can also send data and text along with video and audio signals simultaneously. Data and text can be sent through the Vertical Blanking Interval (VBI) which is the unused portion of the television screen (the VBI is the black line at the bottom of the television screen). "The Public Television Service (PBS) recently demonstrated potential uses of the VBI, the unused portion of the video signal, as part of its Educational Pipeline project. PBS plans to use the VBI to deliver student and teacher guides and support materials, program information, and computer software, including complete interactive computer-based courses" (OTA, 1989, p.62).

Broadcast television has another option available to small communities. Low Power Television (LPTV) operates exactly like the regular broadcast television technology,

but at a much lower power level. This low power level will only send the channel signal about twenty miles in radius. Due to the reduced signal level, LPTV is able to run at a lower cost than regular broadcast stations.

Another form of television broadcasting that is no longer used is the technology of Aerial Broadcasting. This technology was used in the 1960s by the Midwest Program on Airborne Television Instruction. The program used an airplane that carried a television transmitter that flew at 23,000 feet and transmitted instructional television to schools in six states. The process was terminated because the commercial broadcasters feared profiteering stratocasters (Smith, 1961, p.15).

Microwave Broadcasting. Microwave systems transmit from point to point. Unlike broadcast television with an omni-directional tower, microwave travels from the transmitting site directly to the receiving site. The receiving site must be exactly tuned into the transmitting signal. Both transmitting and receiving sites must have special equipment. The transmitting site has a tower with a transmitting dish or the dish is attached to the top of a tall building. Microwave systems are terrain and building sensitive. The receiving site must have a receiving dish that is in a direct line of the transmitting dish. The receiving site must also have the proper equipment to hear, see or print the material being sent. Microwave systems can transmit video, audio, and text in either one- or two-way technology. There are two types of microwave systems:

Short Haul System - Have a transmitting range of five to fifteen miles between towers and are not regulated by any state agency.

Long Haul System - Have a transmitting range of thirty miles between towers.

Instructional Television Fixed Service. Instructional Television Fixed Service (ITFS) is a band of microwave frequencies set aside by the Federal Communications Commission (FCC) in 1963 exclusively for the transmission of educational and cultural programming. There are twenty channels assigned to ITFS (OTA, 1989, p.) ITFS uses an omni-directional microwave signal to transmit its educational programming. The main

signal of an ITFS system is designated for the use of video. In addition to the main video channel there are two subchannels capable of carrying audio, data, and still pictures. ITFS systems usually function similarly to a broadcast television system. The ITFS system broadcasts from transmitting point to multiple receiving points. ITFS systems are unlike broadcast systems because of the need for a special piece of equipment called a down-converter to transform the microwave signal into a broadcast signal before it can be received by a television monitor. ITFS can be used as a stand-alone system delivering locally produced and originated programming to the receiving sites or it can receive a program and rebroadcast it to the receiving sites.

ITFS is used primarily as a one-way video system with the capability of using two-way technology. Two-way technology can be achieved by using the sub-channel signals as an audio link. Similar to that of broadcast television, ITFS systems usually use a telephone to accomplish two-way interaction between teacher and student. The use of the sub-channels requires additional equipment for two-way audio use and, because of the cost of the additional equipment, the telephone is usually used instead. Two-way video is also possible, but it greatly increases the cost of the system. Data or text can be transmitted simultaneously, similar to broadcast television, by using the VBI as the receiving source.

Satellite Broadcasting. Satellite broadcasting involves an earth station sending a signal to a satellite above the earth and the satellite re-sending the signal down to the earth so that anyone with the proper receiving equipment can view the program. Satellite is similar to broadcast television in that it is a point to multipoint system. It differs from broadcast television in that there is extra equipment needed to receive and decode the satellite signal. There are two types of satellites: geosyncronous and low-altitude. Geosyncronous satellites are named that because they are placed 22,300 miles above the earth's surface in the geosyncronous orbit in outer space. The satellites placed in the geosyncronous orbit stay in one location and stay in rotation with the earth. Low-altitude satellites are smaller in size and cheaper to construct. These satellites are placed lower in

altitude than the geosyncronous satellites and do not follow the earth's rotation. This means the satellite can only be used for moments at a time a few times during the day, and this is the only time when the receiving site can receive information. The low-altitude satellites are not intended for continuous use as are the geosyncronous satellites.

Satellite systems have two basic types of transmission and receiving signals used in distance education. The two types of signals are called C-Band and Ku-Band. The C-Band satellite signal operates on a lower frequency, is not subject to interference from inclement weather; requires a larger receiving dish, is the oldest in use and the most common one in use, and is more expensive to install. The Ku-Band satellite signal operates at a higher frequency than the C-Band signal, is subject to inclement weather but not terrestrial microwave signals. There is another satellite signal that is available for use. The Ka-Band is the highest frequency satellite signal available and is reserved for federal government use.

All satellites can carry video, data, and audio information. Satellite systems have the capability of carrying two-way video and audio, but transmission from a site is much more expensive than mere reception by a site. On a satellite, transponders receive and retransmit the information. The transponders are located on the body of the satellite. The satellite must use one transponder to receive video information and another transponder to re-send the video information. A satellite might have only twenty-four transponders, and if one is used to receive the information and one is used to re-send the information, that is one-twelfth of the capacity of that satellite. If two-way interaction is used it takes another two transponders, and achieves an interactive link-up between only two sites. This is why two-way video and audio by satellite is not used very often. Typically, the telephone serves as the interaction link between the teacher and student.

Cable Systems. Cable systems use almost every technology involved in distance education to distribute programming to a community subscription audience. Cable systems use coaxial cable for most of their distribution. Coaxial cable is created by the weaving of

smaller strands of copper wiring encased in a plastic cover. This cable carries video and audio to television sets without a special converter. Cable systems also use fiber optic cable, and microwave antenna to distribute programming. "Fiber optic cable work by converting the analog electronic signals of voice and video and the digital signals of data into light signals and transmit them over strands of glass" (OTA, 1989. p.75). The information sent through fiber optic cable can be sent in a digital or analog format. The most common way to send information through fiber optic cable is digitally. The way analog information is sent through the cable is by changing analog signals into digital bits which are transmitted by Laser or Light Emitting Diodes (LEDs) and sent along the fiber strands. The receiving equipment receives the light impulses and converts them back into analog information. This technology can be used to send one- and two-way information.

Local cable companies receive programming information through local programmers or broadcasters. The companies receive the information through the technologies of satellite, broadcast, and microwave, but the main feeding source for cable systems is satellite. The information distributed by cable systems is generally one-way video technology. Two-way interaction is possible through cable systems by using reverse channels. This practice is limited and cost prohibitive. For most telecommunication courses the interaction between teacher and students is conducted via the telephone system.

Cable systems distribute information by a design called a "headend" that carries the system's main video and audio signal. From the headend there are branches that service residential areas, schools, and businesses. This technology is considered to be a point to multipoint system similar to broadcast television, satellite or ITFS.

Compressed Video. Compressed video technology is most commonly associated with a fiber optic network. This technology offers two-way (fully interactive) video and audio transmission and reception. Compressed video is a digital process of taking signals and compressing them into a more compact signal so other information can be sent through

the same fiber and save space on the fiber optic cable. The video product of compressed video appears to be smeared or shadowy because the compression and re-expansion process has a delay period between sending and receiving. Compressed video is also known as limited motion video because of the end product. Compressed video may also be sent through microwave technology. Advances are being made daily which continue to improve the quality of the compressed video signal, making it more acceptable to users accustomed to full-motion video.

Current Programs In Distance Education Using Television By Satellite

In 1989 the United States Office of Technology Assessment (OTA) published a book of compiled material on the subject of distance education. The book described distance learning programs past and present, detailed the technology being used, and included a host of other information to inform people about the status of distance education. The following is a brief description of some of the programs listed by the OTA.

Satellite Telecommunications Educational Programming (STEP) Network

The STEP network, located in Spokane, Washington, broadcasts Advanced Senior English four days a week to about eighty high schools across an eight-state area in the Northwest. The course is intended to prepare students to take the Advanced Placement (AP) test in composition before their first year in college. The course was created to provide students the option of taking an AP course where school districts could not afford the more specialized personnel to offer the course.

The AP course is delivered by satellite and is made interactive by a local telephone connection. Satellite was chosen because it could reach the entire state of Washington (as well as schools in other states) and establish a link with a local university. The course uses a 1-800 number to connect the students with the instructor during the broadcast of the course. The 1-800 number was established to achieve response from the students before, during, and after the broadcasts. When students respond to a question posed by the

instructor, make a comment in general, or ask a question of their own, their school name and location on a map is flashed on the screen. Students can also use the 1-800 number Monday through Thursday to call teaching assistants for help with the course work.

The course is delivered Monday through Thursday for fifty minutes a day. The course was set-up on a four-day week to allow one day a week for students to be able to catch-up on any broadcasts they might have missed during the week due to illness or other school activities. Fridays are also set aside for taking tests that were previously sent by the telecourse instructor or for work on group projects which were assigned from week to week.

The STEP network also offers two courses in Japanese, two in Spanish, and one course in Calculus. All credit course structures are designed just like the advanced English course. STEP also offers enrichment courses that are delivered to elementary and middle schools on Fridays when regular STEP courses are not being broadcast.

Board of Cooperative Educational Services (BOCES)

This program example is carried by The Telelearning Project offered by the Delaware-Chenango BOCES. This network is one of the pioneers in distance learning in New York State. BOCES is an audio-graphics network that serves 10 of the 18 rural districts in rural New York. BOCES provides a way of delivering courses to districts that cannot offer a full curriculum on their own. This network can also provide home schooling to students who cannot physically go to school. For example, BOCES provided courses to a student who was home bound because of back surgery and who could not attend school for a long period of time. In 1988, fifteen students participated in the program from ten separate schools.

The equipment needed to participate in the courses offered by the network are a computer, graphics tablet, and a speaker phone. In addition to regular course work, the audio-graphics system offers a program called "The Electronic Field Trip" which allows students to visit other schools and political offices through the computer. The purpose of

this program is to offer some cross-cultural experiences to the students, most of whom are from rural areas and would not have the opportunity to visit with people such as students in a sixth-grade classroom in another school, the mayor of Birmingham, or classrooms in other countries. One of the largest programs conducted through the field trip was an interview with a well known rock musician. The students had to be well prepared to participate in the interview and those who participated in the interview were able to ask questions live via computer and speaker phone.

Kids Interactive Telecommunications Project by Satellite (KITES)

KITES is a project created by a consortium of public secondary schools, higher education, and private industry. The goal of this consortium was to establish a teleconference with a West German school that had experienced the Chernobyl nuclear accident and talk about current issues of nuclear power. On June 1, 1989, students from three Massachusetts middle schools met their West German counterparts live via satellite. The project was sponsored by the American Schools, University of Lowell, Massachusetts Corporation for Educational Telecommunications, Massachusetts Educational Television, German educators, and the Digital Equipment Corporation. These agents joined together to form a cooperative international telecommunications partnership.

Digital Equipment Corporation made available its two-way international network, loaned VT 100 terminals and computers to the Massachusetts students and one to the German schools for interaction throughout the academic year prior to the broadcast.

To prepare the students for the interaction with their German peers, the University of Lowell's College of Education worked with local teachers to develop curriculum and offer training in the use of two-way television technology. KITES also sponsored bi-weekly environmental sciences classes on the university's instructional network. The university has a full interactive two-way television facility.

Panhandle Share-Ed Video Network:

The Panhandle Network is located in the northwest Oklahoma Panhandle where schools and people are few in numbers. The Panhandle Share-Ed Video Network is a two-way full motion fiber optic network. The network links four schools together to offer the option of sharing courses that all four schools would not be able to offer otherwise. The network allows schools to share teachers and expand course offerings, provide inservice training for teachers, and provide local programming for community education. The network serves four school districts that span a great distance in their coverage area. These districts and distances include: The Beaver district that has over five hundred K-12 students that come from a 426 mile area; Forgan district with over one-hundred ninety K-12 students who come from a 397 mile area; Balko district with over one hundred fifty K-12 students who come from a 305 mile area; Turpin district who over four hundred K-12 students who come from a 303 mile area. This need to share programming and teachers created a partnership between the four schools and a telecommunications company, Panhandle Telecommunications Systems, Incorporated.

The equipment used in this full motion network was a system of fiber optic cable connecting all four schools, telecommunication hook-ups (Co-Decs), and studio classroom equipment which included cameras, television monitors, telephones, videocassette recorders (VCR), and facsimile (Fax) machines. The fiber optic lines are leased for five years at a time from Panhandle Telecommunications Systems, Incorporated.

The courses shared by the four-district network included Spanish, AP English, Art History, and Accounting II. The technology in use in these courses allows all classrooms to see each other and the teacher simultaneously. This helps with the interaction of the course because there is a face with a name at all times. The classes were limited to a total enrollment of twenty students each and each receiving classroom had a proctor present who was appointed by the principal.

Other courses currently offered using telecommunications technology not included in the OTA's book includes the following.

Arts and Sciences Teleconferencing Service (ASTS):

In the academic year 1993-1994 a new elementary course is available through Oklahoma State University's ASTS. The new course is "German by Satellite Language Awareness for Elementary School Grades K-3." The course is offered through videocassette and gives students an awareness of the language and culture of the German-speaking countries. The equipment needed to participate in the course is a VCR, television, and a audiocassette recorder. The course is a series of videotapes that talk about the German culture and language. The teacher using the videotapes is not required to know the German language. The course is designed to allow a teacher to work it into the established daily schedule.

Effectiveness

In this chapter the history and some comparative definitions of distance education have been given. The technologies that deliver the information to the distance learner and some examples of programs using these technologies have also been provided. The question that is generally asked is: does distance education really work?

There are two major areas of distance education that must be considered when answering the question of effectiveness. The issues affecting adult learning might be different than those affecting the K-12 learner. The United States Congress: Office of Technology Assesment in the book titled, Linking for Learning examined the effectiveness of distance learning and concluded that most research has been conducted in the adult learning situation: "when used in business, military training, and adult learning, there is no significant difference in effectiveness between distance learning and traditional learning" (OTA, 1989). Another study of effectiveness is included in Verduin and Clark's book Distance Education (1991) which concludes that "distance education methodology appears to achieve cognitive outcomes equal to those achieved by the more traditional means of

educational delivery for adults. In many cases the scale even tips toward distance education" (111).

In researching the area of K-12 education and the question of effectiveness the results appear to be positive. "One survey of K-12 and adult distance education literature suggests that students learn as well in distance education programs as they do in regular programs" (Batey and Crowell, 1986). One program that the OTA lists as an example is Iowa's distance learning program. " Iowa's two-way interactive television (TWIT) project found no significant differences between these classes and other sections of the same class taught face-to-face by the same teachers. Daily lesson scores, test scores, grades, and level of participation were comparable for the two groups" (1989). In Illinois a two-year evaluation of an interactive television consortium was conducted by administering pre-and post-tests in both traditional and distance education classes. "The preliminary results show that there is no difference in the scores between students in traditional classes verses those in the interactive television for identical courses" (Robinson and West, 1986). The OTA (1989) states that video-based interactive instruction is the distance learning format that most closely resembles the traditional classroom.

Need for this study

The BEAR course is an attempt to teach K-12 students at a distance through satellite technology with the assistance of computer software. When a new idea is followed through on and becomes a program that could help people do something for the betterment of society, it should be documented. A documented record, in this case of the BEAR course, can offer a reference for review by those who want to participate in the program offered, or who want to understand the larger phenomenon of which the case study is one example, or who want to benefit from the experience of others as they design their own programs and search for their own ways to improve instruction at a distance. There is a need for documentation because ideas and philosophies do not become public knowledge until someone decides to record the information and make it accessible to the public. This

is the purpose of this study on the BEAR course. Until this information is completed in a case study format, only the people who designed, subscribed to, or helped set up the BEAR course will know anything of the detail about the course.

CHAPTER III

METHODOLOGY

Chapter Overview

The following chapter describes the process which was used to collect the information presented in chapter four of this descriptive case study of the "Basic English and Reading" (BEAR) telecommunications-based course which was designed in 1988-89 and offered in 1989-90 through 1992-93 by the Arts and Sciences Teleconferencing Service (ASTS) of Oklahoma State University (OSU). It also addresses the assumptions and limitations inherent in this kind of research.

Case Study Unit of Analysis

The purpose of this case study was to give a complete account of the BEAR course from its inception in August 1988 through its cancellation in May 1993. This account is written with the hope that the information might be used to educate others about this form of distance education that combines the use of satellite television transmissions, computer software, and traditional classroom teaching methods. The course itself was the unit of analysis, and the case study attempts to describe the course from existing records and the recollection of key people with respect to the course itself and the context in which it existed--namely, the Arts and Sciences Teleconferencing Service (ASTS) of Oklahoma State University (OSU) and the Midlands Consortium Star Schools grant.

Description of Research Approach

The vast majority of the information that exists regarding the original design and subsequent delivery of the BEAR course is contained in the memories of the people who

were involved with the BEAR course from its conception to completion. This information was collected for this case study through interviews with these key people; information was also obtained through an examination of the written materials, including correspondence, regarding BEAR, the ASTS operation, and the Midlands Consortium Star Schools grant, which existed in the ASTS files. Written materials examined included the Federal Register description of the U.S. government's Star Schools program; the Midlands Consortium Star Schools Grant proposal; the course catalogs distributed annually by ASTS; the Teachers Manual for the BEAR course; student work from the BEAR course provided by Dr. Joyce Nichols, the course instructor, including the anthologies of student work published twice each year during the course's operation; and miscellaneous reports and correspondence pertaining to ASTS and BEAR which was made available by Dr. Nichols or by Leigh Fisher, Manager of ASTS. Research on the BEAR course began in February, 1991, and continued through September, 1993.

Data Collection Plan and Recording

The data collection plan for the BEAR course involved a series of interviews with the five key people involved in the design and development of the course. The interviews were based upon a list of questions concerning the origins and development of the course. Once the questions were answered by each of the individuals, their individual answers were organized under a series of more general category headings that could be used in setting out the history of the course in both a chronological and topical approach. Topical category headings included: Program Design; Program Funding; Program Curriculum: etc. The interviews were recorded by audio cassette.

The written records, reports, and correspondence that exists on BEAR and ASTS were examined by the researcher and notes were taken of information relevant to documenting the development and operation of the course. The information was later organized in both a chronological and topical approach, similar to the organizational method used with the interviews.

As part of the research into the course itself, two studio visits were made to the Educational Television Services studios to view the broadcast portion of the course first-hand. During these visits Dr. Nichols was observed presenting the information included in the lesson plans for each week, and the studio equipment used for the production of the broadcasts was examined. These studio visits occurred during the Spring semester of 1991, the second year of the program's existence.

The studio visits and the examination of the written material available helped to formulate a list of research questions to ask the key people involved in the development and production of the course. The BEAR course existed under ASTS, which is a part of the programming produced by the Arts and Sciences Extension Office in the College Arts and Sciences at OSU (TABLE I). The relationship of the different entities/organizations that form the context within which the BEAR course operated is illustrated on page 34.

The research process began with investigating the relationship of the BEAR course to ASTS and how ASTS functioned within the Arts and Sciences Extension Office and the College of Arts and Sciences of OSU. Next, the initial funding for BEAR was examined, including the connections that existed between OSU and the various partners that came together to submit the proposal for a Star Schools grant which provided BEAR's initial funding. The final part of the research revolved around an intensive study of the BEAR course itself.

Research Questions

All of the interviews and the examination of written materials were based on a series of research questions that were formulated at the beginning of this research project, which corresponded with the third year of the BEAR course. The research questions included:

- What prompted the idea of the Basic English and Reading (BEAR) course?
- What was the context within which the course came to be?
- How was the initial development and subsequent years of operation of the course funded?

TABLE I

ORGANIZATIONAL CHART

Oklahoma State University

College of Arts and Sciences

Arts and Sciences Extension Office

Arts and Sciences Teleconferencing Services

Basic English And Reading Course

- Who designed the BEAR course?; what were the person's qualifications to teach the course?

- Was the BEAR course based upon any one or any combination of distance education theories?

- Why were seventh and eighth grades chosen as the target age group to participate in the BEAR course?

- What were the long- and short-term goals of the BEAR course?

- What were the instructional components of the BEAR course? Have these changed over time? If so, why?

- What technical resources were available and used to develop the Reading In Progress (RIP) portion of the course?

- How did the students communicate with the television instructor of the BEAR course?; could the students talk to the instructor directly?; if so, when could they talk to the instructor?

- What type of assistance and supervision were given to the students in the receiving site classrooms?

- How were the students graded?; who determined a student's grade for the course?; how did that grade affect the remaining grades on the report card?

- How were the BEAR course students measured in their progress throughout the year?

- Did the BEAR course have an effect on the students' remedial English skills while participating in the course?

- What, if any, studies were conducted to evaluate the BEAR course?

- How many schools and students participated in the course?

- What is the future status of the course?

Other questions were derived from the answers given by the interviewees during the interviews and by information obtained from written materials. The questions listed above were the initial questions asked of the interviewees, which also formed the basis of the initial review of the written materials.

Interviewees and Schedule

Interviews were conducted based on the initial research questions. Interviews were conducted with Dr. Smith Holt, Dean of the College of Arts and Sciences; Dr. Connie

Martin, Director of Arts and Sciences Extension and one of the authors of the Midlands Consortium Star Schools Project grant which provided the initial funding for the BEAR course; Leigh Fisher, Program Manager for the Arts and Sciences Teleconferencing Service at Oklahoma State University from the time of the Star Schools grant proposal through December 1992; Dr. Joyce Nichols, teacher and creator of the BEAR course; and Beverly Nichols, Satellite Instruction Specialist and Dr. Nichols' assistant for the BEAR course. (Interviewing schedule on page 36)

There were other people involved in implementing the plan of work of the Midlands Consortium Star Schools grant. They were not interviewed because they were not involved with the BEAR course but instead were key figures in the development of some of the other components of the Star Schools grant. All the key people involved in the design and development of BEAR were located on the campus of Oklahoma State University and they all participated in this study.

Methodological Assumptions

It was assumed that the subjects of the interviews would remember accurately what had transpired in the past and that they would be truthful and as complete as possible in sharing their recollections. It was also assumed that the written materials that were made available to the researcher by those involved with the BEAR course and ASTS would be the complete documentation that existed that was relevant to the researcher's expressed interest in both the BEAR course and the context in which it was offered--namely, ASTS and the Midlands Consortium Star Schools grant.

Limitations

This case study provides an in-depth examination of one telecommunications-based course, specific to a subject, to a targeted audience, to the resources that were available for its production, to the context in which it was operated. Because of this narrow focus, the study is limited in its representation and does not allow valid generalizations to the

TABLE II

INTERVIEW FREQUENCY AND METHOD

Person Interviewed	Number of Interviews	Interview Method
Dr. Smith Holt	One	Telephone (Recorded)
Dr. Connie Martin	One	Face-to-Face (Notes)
Dr. Joyce Nichols	Five	(1) Face-to-Face (Notes) (4) Telephone (Recorded)
Leigh Fisher	Three	(1) Face-to-Face (Notes) (2) Telephone (Recorded)
Beverly Nichols	Two	(2) Face-to-Face (Notes)

population of all telecommunications-based courses. On the other hand, a series of case studies similar to this, focused on other examples of telecommunications-based courses, would form a mosaic that collectively would document the history of this relatively new form of instructional delivery at the same time as the series might offer insight into how to use this technology effectively for this purpose.

CHAPTER IV

RESEARCH FINDINGS

Introduction

The following chapter presents the findings of the case study of the "Basic English And Reading (BEAR)" course that was delivered by Oklahoma State University to students in grades 7 and 8 nation-wide through telecommunications. The study begins with the initial development of the course, follows it through the four years of its delivery, and concludes with the decision to cancel the course and eliminate it from Oklaoma State University's schedule of program offerings.

The "Basic English and Reading" (BEAR) course was just one of the educational programs created, produced, and offered by subscription through the Arts and Sciences Teleconferencing Service (ASTS) at Oklahoma State University (OSU) in Stillwater, Oklahoma. ASTS is one of the extension programs offered by the OSU College of Arts and Sciences. ASTS designs and offers distance education courses via satellite to students in elementary and secondary schools across the United States. Oklahoma State University is located in the city of Stillwater which is located in the north central part of Oklahoma. OSU is a state supported public "Land Grant University" (the land for the university was provided by the United States government and the institution has an Agriculture/Mechanical Science focus) with an enrollment of over 18,000 students.

The Basic English and Reading course (BEAR) was made possible by two developments. The first was the establishment of the Arts and Sciences Teleconferencing Service (ASTS) in 1985. The establishment of ASTS provided an avenue for Oklahoma State University (OSU) to create, produce and distribute a variety of courses aimed at high

school students. The second development was the formation of the Midlands Consortium in 1988 and its submission of a grant proposal for federal assistance from the U.S. Department of Education (DOE) under the Stars Schools program.

The remainder of this chapter describes and traces the history of the "Basic English And Reading" (BEAR) course. The first section will provide an overview of the ASTS operation within the College of Arts and Sciences. The second section will describe how the BEAR course was initiated and the sources of funding for the development of the course. The third, and final, section of this chapter will examine the Basic English and Reading course itself.

Arts and Sciences Teleconferencing Services

History. The Arts and Sciences Teleconferencing Service (ASTS) was an idea that grew out of a change in OSU's graduation requirements. In the Fall Semester of 1983, the Oklahoma State University (OSU) faculty voted to increase the university's graduation requirements. One of the changes was a requirement that students have a foreign language credit before they graduated. The requirement could be met either by receiving two years of foreign language instruction in high school or by receiving one year (10 credit hours) at the university. Some of the smaller school districts in the state of Oklahoma were upset by this change in graduation requirements. The districts were unhappy because they did not have the financial resources to provide a foreign language instructor. "My phone was ringing off the wall," said Dr. Smith Holt, Dean of Arts and Sciences at OSU. (Holt 10/6/92) Dr. Holt responded to the small schools' needs by providing a possible solution to the problem: Offer foreign language classes from a distance by either phone or satellite transmission. "We needed to find some way to provide their students with the opportunity to take a foreign language while they were in high school. So, we decided that this was the best way to do it." (Holt Interview 10/6/92)

ASTS at Oklahoma State University began delivering distance education programs to K-12 schools at the beginning of the Fall semester in 1984. During the 1984 - 1985 academic year Dr. Holt approached Dr. John Folks, State Superintendent, and Sandy Garrett, Director of the Gifted and Talented program and later Director of Rural Education for the State Department of Education (SDE), for monetary support. According to Leigh Fisher, manager of ASTS from 1988-1992, "Sandy (Garrett) and Smith (Dr. Holt) took the legislation to the House and Senate for the Small Schools Cooperative Grant program and that provided funds for the [Oklahoma] schools to get satellite equipment so they [ASTS] could start the program up." (Fisher Interview 10/6/92) The Small Schools Cooperative Grant program was established to provide moneys to smaller schools for equipment purchases the schools might not be able to afford otherwise.

Private industry also supported the ASTS objective to provide schools with foreign language courses. "Cotton Electric down in the Southwest part of the state, in Walters, Oklahoma, donated twenty plus dishes to schools in their service area." (Fisher Interview 10/6/92) This donation was crucial in establishing a critical mass of subscribers for ASTS because, according to Leigh Fisher, a majority of the sites during the first year of satellite transmission were located in the southwest part of Oklahoma. (Fisher Interview 10/6/92)

The first satellite transmitted program presented by ASTS was a non-credit English Composition teleconference that was divided into five one-hour segments and was presented to high school students to enhance their English composition skills. The program was also accessible to anyone with satellite receiving equipment within the satellite transmission area. A satellite transmission area consists of the geographical locations which are able to receive the transmission because they are inside the transmission "Footprint". A satellite transmission is called a "Footprint" because that is what the transmission area looks like when it is projected on the ground. The particular satellite used most recently by ASTS is "GALAXY VI" and its "Footprint" includes all of North America and Hawaii.

During the Spring semester of 1985, the second semester of ASTS' existence, the staff developed what Leigh Fisher, Manager of Arts and Sciences Teleconferencing Services (ASTS), calls "Enrichment Programs" and "German I" live via telephone. (Fisher, Interview 3/5/92) The Enrichment Programs were offered as informational sessions to supplement the K-12 curriculum. There were a total of six programs, with each program consisting of at least two broadcasts. The six programs were:

> Biology Plant Tissue Culture: This series included a segment on carrot cloning which involved factual information on how a new strain of carrots was discovered and how the genetic process proceeded. The program was taught by an OSU professor who was currently working on the cloning project.
>
> Great Ideas of Great Thinkers: The program consisted of three one-hour segments subtitled The Pursuit of Happiness, Who Was Karl Marx?, and The Problem of Evil.
>
> Electoral College System: This series, which dealt with the process of electing a United States President and how the Electoral System is designed, combined social studies and mathematics content.
>
> Ethnic Groups of Oklahoma: This series of programs examined the history and culture of ethnic groups represented in Oklahoma. The series was divided into three one -hour segments.
>
> Teaching Writing Through Literary Genres: Intended for high school students, the series offered suggestions on how to improve one's own writing through the study of the writing of others.

"German I live via telephone" was the first step towards the goal of providing a foreign language course to small Oklahoma schools. This live audio transmission involved only Beaver High School in Beaver, OK. For the first time in the history of distance education, a university was teaching a secondary level course live at a distance.(Fisher Interview 10/6/92) There was no person or illustrations to watch on a television screen, just a person's voice over a telephone line. However, the students were able to converse on the telephone with the teacher. German I was and is taught by Dr. Harry S. Wohlert. Dr. Wohlert was chosen to teach the course because " Harry (Dr. Wohlert) had developed quite a bit of computer software for his on-campus students to work with and he had received teaching awards and he was very well known as someone who was vivacious and

very out-going and would be good on camera." (Fisher Interview 10/6/92) The set of Enrichment Programs and German I live via telephone made up the second semester of the ASTS schedule.

In the Fall Semester of 1985, ASTS discontinued the satellite transmission of the "Enrichment Programs" and began the video broadcasting of German I via satellite. Participating schools received the transmission with a satellite receiving dish, and paid a fee to ASTS to subscribe to the program. This was the only class offered by ASTS throughout the 1985 - 1986 school year. During the same academic year, a private industry in Texas, the TI-IN network (pronounced Tie-In), also began broadcasting secondary courses by satellite on a five-day-per-week basis, using certified high school teachers. What made ASTS different was its use of college professors and its development of an instructional model that included only two or three days of live broadcasts per week, depending on the course, and a program of individualized instruction, heavily dependent in most courses on the use of computers, on the non-broadcast days.

During the 1986 - '87 school year, ASTS continued the German I broadcasts and added two new satellite courses, German II and Advanced Placement (AP) Physics. With the creation of German II, ASTS fulfilled its goal of providing schools with access to two years of foreign language instruction. The nature of the demand for Advanced Placement (AP) courses is similar to that for foreign language courses in that the smaller schools are sometimes not able to offer AP courses because they can not afford to hire or can not attract AP certified teachers. AP courses are designed to give high school students the option of acquiring college credit via successful performance in a standardized test at the conclusion of the AP course. The addition of AP Physics offered high school students at smaller schools the opportunity to prepare for the college credit standardized test in physics in addition to receiving high school credit for their successful completion of the year-long course. German I was not designed to be an AP course. However, a student who has

received two years of a foreign language in high school can test out of the college requirement once admitted to the university.

Along with the addition of German II and AP Physics, ASTS developed three staff development teleconferences which were also broadcast via satellite transmission. The staff development teleconferences were designed to present current and new information as continuing education for school administrators and teachers. ASTS discontinued the staff development programs at the end of the 1991-'92 academic year because, according to Leigh Fisher:

1. ASTS could not "break even" on the cost versus income issue.
2. The College of Education was also offering staff development programs.
3. ASTS needed to concentrate on the design and development of new and existing courses for students. (Fisher Interview 10/6/92)

In 1987 - '88, ASTS continued to offer German I and II along with AP Physics. The new addition to the course schedule for the Fall semester of 1987 was an AP Calculus course. Now two college preparatory courses were accessible by satellite. Trigonometry was offered as a new one-semester course in the Spring semester of 1988.

In 1988 - '89, ASTS continued the previous courses and scheduled Trigonometry during the Fall semester and paired it with a one-semester Analytical Geometry course during the Spring. ASTS also added a one-semester AP American Government course in the Spring semester of 1989. At the end of the 1989 Spring semester, seven courses were available by subscription through ASTS: five of them were year-long courses and two were a one-semester offerings.

A large increase in the ASTS course offerings took place during the 1989 - '90 school year. Four new courses were added to the ASTS course schedule. These included three year-long courses: AP Chemistry, Russian I, and the Basic English And Reading course, and one semester-long course, Applied Economics. These new courses were funded in part by three different grants:

AP Chemistry was funded by the National Science Foundation.

Applied Economics was funded by a Phillips Petroleum Company Grant, in cooperation with Junior Achievement.

Russian I was funded, in part, by the Midlands Consortium Star Schools Grant.

Basic English And Reading was funded, in part, by the Midlands Consortium Star Schools Grant.

In 1990 - '91 ASTS offered the same courses as in the 1989 - '90 school year. In 1991 - '92, Russian II was added to the schedule at the request of the Oklahoma Department of Education, which helped to fund the development of the course. The 1991 - '92 school year was the largest programming year for ASTS. Within eight years, ASTS grew from one to twelve credit courses delivered via satellite to approximately 649 downlink sites with an enrollment of 5,316 students at the end of the 1991 - '92 school year.

At the end of the 1991 - '92 school year, the administrators at ASTS decided there was a need to delete some of the course offerings for the 1992 - '93 school year. According to Leigh Fisher, Manager of ASTS, the courses were deleted because of the low number of participating schools in the individual courses. (Fisher Interview 10/6/92) ASTS deleted the following courses:

- Trigonometry/Analytical Geometry
- Applied Economics
- Russian I
- Russian II
- AP Chemistry
- AP American Government

ASTS began the 1992 - '93 school year offering five credit courses and a non-credit test preparation program via satellite transmission. The courses included:

- German I
- German II
- AP Physics
- AP Calculus
- Basic English And Reading
- Getting Ready for the PSAT/NMSQT and the SAT

The first five of the six courses listed are the remaining carryover courses from previous years. The sixth course listed was a new course offered to help junior and senior level high school students prepare themselves to take a college entrance exam. The course is called "Getting Ready for the PSAT/NMSQT and the SAT". PSAT/NMSQT is the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test which is a shortened version of the "SAT" (Scholastic Aptitude Test). The PSAT/NMSQT is used as a preliminary test to predict the outcome of the SAT prior to taking the actual test. The PSAT/NMSQT scores are also used to determine National Merit Scholarship candidates. The SAT is one of the two major tests used in the United States as a college entrance exam. The number of students and schools subscribing to the courses are denoted in Table III on page 46.

All ASTS courses are offered live via satellite transmission, with an occasional exception of a pre-recorded program when the professors are conducting site visits. During the live broadcasts, the students have the option of voice interaction with the professor. The professor can be contacted during or outside the broadcasts via a "1-800" toll-free telephone number. Telephone calls during live broadcasts are usually initiated by the instructor asking a question directed to a particular school. An instructor might also have a particular time set aside during the broadcast to accept general questions about the assignments. Most of the telephone calls received are scanned by the instructor's assistants before being patched through to the live broadcast. Each course has its own individual toll-free number and the course instructor has assistants or answering machines available to receive the telephone calls during off-broadcast times.

Costs. While some distance learning providers charge a general membership fee for a school to belong to their networks and then also charge separate course-specific fees for the programming to which the school subscribes, ASTS charges no general membership fee. Instead, ASTS charges schools only course-specific subscription fees.

TABLE III

SUMMARY OF NUMBER OF SITES AND STUDENTS INVOLVED
IN ASTS COURSES DURING PEAK YEARS 1991 - 1992

Course	# Students	# Schools
AP Physics	650	97
AP Chemistry	146	25
AP Calculus	321	53
Trigonometry/Analytic Geometry	121	16
German I	1951	192
German II	370	87
Russian I	158	24
Russian II	23	6
AP American Government	201	31
Applied Economics	233	32
Basic English and Reading	645	44
PSAT/NMSQT series	*	266

* Schools do not report student numbers for the PSAT/NMSQT series

In setting the fees, ASTS differentiates between Oklahoma and non-Oklahoma schools. Lower rates are set for Oklahoma schools because in most years ASTS has received funding from the Oklahoma State Department of Education to support ASTS programming, and for this support ASTS keeps the rates to Oklahoma schools lower than the rates for non-Oklahoma schools.

The ability of ASTS to offer its courses is dependent in large part on the number of subscriptions it receives for the courses it offers. The typical operating budget for OSU to deliver a course is $160,000 - $220,000 per year. Some courses are more expensive to operate, depending on the materials and production time required for presenting the instruction. A statement on the subscription agreement which schools return to ASTS to indicate their intention to participate in a course makes clear that ASTS reserves the right to cancel a course due to insufficient enrollments and states that schools will be notified of cancellations no later than August 15th. While ASTS has never canceled a course this late in its planning, it has canceled courses when it seemed likely that subscription income and other sources of revenue, such as grants, would be insufficient to support all of the courses planned for an academic year. To encourage schools to commit early to the courses they are interested in, ASTS offers an "early bird" rate for schools whose subscription agreements are postmarked on or prior to May 1st. The following table indicates the "early bird" and standard rates for both Oklahoma and non-Oklahoma schools that were in effect during 1993-94 (Tables IV and V on page 49).

There are additional costs to be incurred by schools participating in the satellite courses. ASTS identifies for schools the equipment they will need to participate in any ASTS course (e.g., satellite downlink, television monitor, videocassette recorder, two-way speaker phone, phone line for the classroom). In addition it identifies the hardware and materials/software costs unique to each specific course. For example, for the German courses, schools need to have one computer available for every two students participating

TABLE IV

OKLAHOMA SCHOOLS

# of Students	Early Bird Rate	Standard Rate
1	$550.00	$575.00
2	$1,100.00	$1,150.00
3	$1,650.00	$1,725.00
4-10	$2,200.00	$2,400.00
over 10	+$100.00 each	+$100.00 each

TABLE V

OUT-OF-STATE SCHOOLS

# of Students	Early Bird Rate	Standard Rate
1	$700.00	$725.00
2	$1,400.00	$1,450.00
3	$2,100.00	$2,175.00
4-10	$2,800.00	$3,000.00
over 10	+$100.00 each	+$100.00 each

in the course. In addition, the German courses require the purchase of computer software, headsets, diskettes, and text material.

Other courses offered through ASTS specify different equipment needs. For example, the AP Physics course only requires one computer for every six students and the software cost is included in the course fee. There are two textbooks and one student lab manual required for the course. While AP Physics does not involve a great deal of computer software and text materials, the course has a significant lab requirement. Each lab kit, a required purchase for all new subscribers, serves six students.

The AP Calculus course requires minimal specific materials beyond the equipment required to receive the broadcast. The AP Calculus course is unique because there is not a computer required for the students to participate, but there are three different sets of text material necessary for course participation.

Teaching Partner. ASTS requires a "Teaching Partner" to be assigned by the school to each class. The Teaching Partner is a certified teacher who facilitates the teaching of the course at the on-site classroom. This teacher is required to meet different qualifications depending on the course. For example, to be a teaching partner for the German courses the person is not required to have a background in German; to be a teaching partner for the AP Physics course the person is encouraged to have a secondary math or science background, but this is not required; to be a teaching partner for the AP Calculus course the person is required to be certified in Algebra I and II, Geometry, and Trigonometry. The role of the Teaching Partners is to motivate and supervise the students in the classroom every day. ASTS recommends that the teaching partners convey a positive attitude and provide strong administrative support to carry out the responsibilities of the ASTS course. The teaching partner serves as the direct link to the ASTS professor and it is imperative that the teaching partner inform the professor of any situations that might arise and hinder the progress of the students participating in the course. The teaching

partner also assigns the final grade for a student participating in an ASTS course. The professor of the course will provide a grading guideline, but the teaching partner is the person who sees how well the student completes the required assignments and evaluates the conduct of the student in the classroom. Local control of the grading also permits each school to adjust the grades to reflect the standards of the other courses taught at the school by local teachers.

Teaching Partner Orientation Workshop. All Teaching Partners are required to participate in a Teaching Partner Orientation Workshop. Teaching Partners receive training information for the purpose of understanding the operation of the course. There are two ways to receive this training:

a. New Oklahoma Teaching Partners must attend an overnight workshop held in Stillwater, Oklahoma. Experienced Teaching Partners must also attend if they are teaching a course with which they did not previously assist.

b. Out-of-state Teaching Partners are invited to attend the orientation workshop in Stillwater and they often do. If attendance at the workshop is not possible, a videotape that covers the training content, made especially for Teaching Partners who do not attend the orientation workshop, is sent to each Teaching Partner as soon as a course subscription agreement is received by ASTS.

Midlands Consortium: Star Schools Project

On Tuesday, April 5, 1988, a notice appeared in the "Federal Register" announcing the availability of funds from the United States Department of Education (DOE) to support

the development and delivery of technology-based courses to K - 12 schools. The funds were available under the "Star Schools Program" and could be obtained by individual state agencies or multistate partnerships. The following description of the grant program is a summary of the Federal Register notice report :

> The purpose of the program is to provide "demonstration grants to eligible telecommunications partnerships to develop, construct and acquire telecommunications audio and visual facilities and equipment, to develop and acquire instructional programming, and to obtain technical assistance for the use of such facilities and instructional programming, in order to encourage improved instruction in mathematics, science, and foreign languages as well as other subjects such as vocational education." (Federal Register Vol. 53)

As stated in the summary, the program was established to provide programming to disadvantaged educational systems. The amount of funds available under the Star Schools Program was $19,148,000, to be disbursed to grantees over a two-year period. Applicants for this funding had to meet certain criteria. "Telecommunications partnerships must be organized on a state-wide or multistate basis to be eligible." (Federal Register Vol. 53) The criteria required the partnership to qualify itself by including within its organization at least three of the following:

A. A local educational agency that has a significant number of elementary and secondary schools that are eligible for assistance under Chapter 1 [defined in chapter 3 of this research], or are operated by the Department of Interior for Indian children;

B. A State educational agency or a State Higher Education agency;

C. An institution of higher education;

D. A teacher training center which provides preservice and inservice training and which receives Federal financial assistance or has been approved by a State agency;

E. A public agency with experience or expertise in operating or planning a telecommunications network;

F. A private organization with such experience;

G. A public broadcasting entity with such experience.

The Midlands Consortium included partners representing local educational agencies, state educational agencies, and institutions of higher education.

The proposal which was submitted by the Midlands Consortium to the DOE provides a definition of the group: "The Midlands Consortium is a partnership of partners, linking public and private elementary and secondary schools, state departments of education, state school boards associations, and leading universities in five predominantly rural states which have a high percentage of geographically disadvantaged schools and schools which serve a high proportion of Chapter 1 students." (grant proposal) The Consortium was comprised of representatives from Oklahoma State University, the Oklahoma Department of Education, the Missouri School Boards Association, the Missouri Department of Elementary and Secondary Education, the University of Alabama--Birmingham, the University of Mississippi, Kansas State University and the University of Kansas. The consortium was formed to acquire federal funding for the further expansion of distance education and the use "...being made of live, interactive, satellite-based programming to meet the educational needs of school children and their teachers" (grant proposal).

On June 10, 1988, the Midlands Consortium submitted to the U.S. DOE an application for federal assistance for the "Midlands Consortium Star Schools Project." The Midlands Consortium requested $9,418,000 for year one and $7,460,365 for year two of a 24-month project.

When the proposal was written, Oklahoma, Kansas, and Missouri led the five-state area in the amount of satellite equipment already installed at public and private schools. Mississippi and Alabama had one satellite-equipped school between them. So, the primary focus of the grant was to enhance the strengths and build up the areas of satellite equipment and technology in the five states involved with the consortium. The ultimate goal of the project was to eventually create "a parity of capability among all five states" (grant proposal). According to the abstract of the original grant proposal, "the primary focus of Oklahoma, Kansas, and Missouri will be on producing programming, and the primary focus of Alabama and Mississippi will be on acquiring satellite downlinks,

microcomputers, and related equipment in order for their schools to be able to participate fully in satellite-based and other technology-based programs" (grant proposal). The following is a list of the Consortium's original objectives for the first and second years of the proposed grant. This list is taken from the "Abstract" published in the original grant:

(1) Equip each year approximately 500 of the neediest schools within the five-state region with the satellite downlinks, microcomputers, and related equipment necessary for them to participate fully in programming which utilizes satellite broadcasts, individualized computer-assisted instruction, and videotaped instruction;

(2) Equip 40 schools each year and Kansas State University, which will serve as a communications hub, with the equipment necessary to participate in Very Small Aperture Terminals (VSAT) demonstration project, which will increase the ability of students and instructors to interact during live satellite broadcasts;

(3) Produce satellite programming in the Star Schools-targeted areas of mathematics, science, and foreign languages as well as other subjects such as vocational education and to produce related programming, such as career education, which will in other ways serve the needs of students traditionally excluded from careers in mathematics and science;

(4) Provide technical assistance and training to school teachers and administrators in the effective use of technology;

(5) Provide staff development programs to school teachers and administrators to update their knowledge in science, mathematics, and foreign languages; their skills in teaching reading and writing; and their ability to motivate and serve the needs of Chapter 1 and other at-risk students;

(6) Identify, evaluate, and disseminate information throughout the Consortium on relevant satellite programming which is produced by institutions and agencies outside the five-state region;

(7) Conduct research and evaluation activities related specifically to the objectives of this project and more generally to distance learning and the effective use of technology in education.

The grant proposal was submitted to the Department of Education on June 15, 1988. After the DOE's review of the grant proposal, the DOE returned a list of 26 questions of clarification to be answered by the Midlands Consortium. The questions centered on the "Plan of Work" section of the original proposal.

The Midlands Consortium was selected from among 68 applicants to receive one of four Star Schools grants awarded for 1988-90. The U.S. DOE requested revisions in the plan of work to match an award of only $5.5 million in year one, instead of the $9.4 million requested. The Midlands Consortium eventually received a second year of funding in the amount of $4.2 million, which made the total award over the two years of the project just under $9.7 million. The most significant changes to the plan of work were cancellations of the proposed work or delays in implementation occasioned by the reduced reward. The most significant changes included:

1. The total number of downlinks to be purchased and installed with Star Schools funding during year one was reduced from 500 to 140.
2. The VSAT project to be housed at Kansas State University was eliminated.
3. Alabama and Mississippi's request for equipment was reduced based on the reduction of the award.
4. There was a delay in the timing of the first broadcast of some of the high school courses.
5. Several teacher training programs were eliminated.
6. Some of the teacher training/staff development programming was delayed until year 2 of the project or until the first year post-grant.

While most of the changes in the plan of work were the result of budget limitations, one change was an addition to the plan of work that was included in response to one of the 26 questions of clarification. Question number ten asked how the proposed program offerings would specifically meet the objective of serving "Chapter 1" schools. The Midlands Consortium's response to the question was the addition to the original plan of

work of a course that addressed reading literacy for high school students with the potential for use with adult audiences. A formal course proposal for the course was returned to the DOE along with the "Modifications To The Plan Of Work..." document submitted on September 16, 1988 by the Midlands Consortium. The course proposal was titled "Reading Literacy by Satellite for Grades 7 - 12 with Potential Application to Adult Education." This course proposal, with modifications, would soon be known as the "Basic English and Reading" course. The original course proposal contained the following outline:

Rationale:

The rationale for the reading literacy course is based on a correlation of the rising high school drop-out rate and the problem of adult illiteracy. There were three factors included in the rationale:

1. The Students: Students receive reading instruction until the sixth grade and if they are not reading at grade level by grade seven they struggle through the best way they can. Those who are handicapped are placed in remedial reading classes and those with extreme difficulties are placed in special education classes. A solution needs to be offered in the regular classroom.

2. The Teachers: The logical person to teach the course is the English teacher because of that person's background in language arts.

3. The Method: The older the student, the more flexibility and independence needs to be given to the learner in his/her learning.

The Proposal:

A two-semester course teaching reading literacy was proposed to be offered by satellite two times a week with computer-assisted instruction available to students on the off-air days. This outline would offer the flexibility needed to fit with a regular English course that might already be on the schedule of a school desiring to participate in the new satellite course. Basic reading literacy concepts appropriate for grade levels 7 - 12 would be the core curriculum of the course.

This concept of teaching basic reading literacy skills appropriate for grade levels 7 - 12 stayed the same during the subsequent months of planning, but the target audience changed when this proposed course became "Basic English And Reading" (BEAR).

The funds provided by the Star Schools program helped start other new courses besides the BEAR course, some of which were developed by OSU. OSU's courses were offered through the Arts and Sciences Teleconferencing Services (ASTS). All courses taught at OSU that were funded by the Star Schools Program are denoted in the following sections of this chapter.

Basic English And Reading Course

Funding. The Star Schools money which was designated for the BEAR course paid for the construction of a set, pre-production of program segments, acquisition of computer hardware and software programs, teacher salaries, and all other expenses incurred in the development process during the first year of the grant. During the second year of the grant (1989-90), the course went on the air and grant funds covered all the operational expenses. The federal government allowed ASTS to collect the fees paid by the schools subscribing to BEAR and deposit these fees into a special account that could be used in future years to underwrite the costs of operating the course, should subscription income fall short of meeting expenses. This gesture on the part of the federal government was important in making it possible for BEAR to operate during years when subscription income fell short.

People Involved in Designing BEAR. The BEAR course was designed by the instructor, Dr. Joyce Nichols, with the assistance of an advisory committee. Dr. Nichols' credentials include:

- Bachelor of Science degree in Education/English
- Master of Science degree in Curriculum and Instruction
- Doctor of Education degree in Adult Education
- 6 years experience teaching remedial English
- 10 years experience teaching Mass Media
- 7 years serving as a District Media Director
- 1 year as ASTS Program Manager

Currently, Dr. Nichols is retired. She retired at the conclusion of the 1992-93 school year. Dr. Nichols taught the BEAR course for four years, the entire life of the program. The program was deleted from the ASTS list of courses in 1993-94 because of monetary considerations. Dr. Nichols became involved in the design of BEAR while working for the College of Arts and Sciences in the Office of Extension as an Extension Program Manager. Dr. Nichols served as Program Manager from 1987 - 1988, and she began designing the BEAR course in the fall semester of 1988. Dr. Nichols was asked to teach the BEAR course after Gwen Turner, EdD, a professor in the College of Education at OSU, declined the opportunity because she was about to take a position with another university.

The Beginning of BEAR. The course began development with the basic outline that was included in the "Modifications to the Plan of Work" that was submitted to DOE during the award negotiation process. After the Star Schools money was granted and the course was accepted as one of the courses targeted to help Chapter 1 students, Dr. Nichols, with the help of the course advisory committee, had eight months to completely design and produce the BEAR course. The Advisory Committee was created by Dr. Nichols by calling the Midlands Consortium state directors (a person had been designated in each of the five states to direct all grant-related activities) and asking for recommendations of people to help design the course. She then sent a checklist questionnaire to the people recommended by the state directors. This checklist questionnaire included a list of possible areas that could and should be covered in the course. The Advisory Committee members checked the items they thought should be included and wrote in other suggestions not included in the checklist. The advisory committee consisted of 21 educational professionals from Oklahoma, Kansas, West Virginia, Arizona, and Mississippi. The committee included:

Jeanne Wells Cook
Language Arts Specialist
State Department of Education
Jackson, Mississippi

Edith Riddly
English Teacher
Wilson School
Henryetta, Oklahoma

Shawn Powell
English/Spanish Teacher
Wilson School
Henryetta, Oklahoma

Mel Riggs
Consultant
Kansas State Department of Education
Topeka, Kansas

Debbie Childers
Curriculum Coordinator
Benton County Schools
Ashland, Mississippi

Dr Judy Robbin
Chapter I Supervisor
Lafayette Elementary
Oxford, Mississippi

Teresa Wood
Chapter I Coordinator
Pontotoc City Schools
Pontotoc, Mississippi

Sherol Gonzalez
Teacher
Wirt County High School
Elizabeth, West Virginia

Linda Collins
Teacher
Wirt County High School
Elizabeth, West Virginia

Carolyn K Bramlet
Teacher
Oxford Elementary School
Oxford, Mississippi

Kathy Verville
Reading Specialist
Arizona Department of Education
Phoenix, Arizona

Dr. Mary Heller
Assistant Professor of Curriculum and Instruction
Kansas State University
Manhattan, Kansas

Penny Langford
Reading Specialist
Jenks Public Schools
Jenks, Oklahoma

Dr. M. Chambless
Associate Professor
University of Mississippi
Oxford, Mississippi

Violet Cole
English Teacher
Lafayette County High School
Oxford, Mississippi

Mike French
Associate Professor
Kansas State University
Manhattan, Kansas

Joe Ancrile
Teacher
Wirt County High School
Elizabeth, West Virginia

Patricia Cline
Teacher
Jones Public Schools
Jones, Oklahoma

Joy Wald
Teacher
Hobart Middle School
Hobart, Oklahoma

Janice Decker
Teacher
Cashion Public Schools
Cashion, Oklahoma

Dr. Nichols and this committee never met in person; they communicated only through the checklist questionnaire and follow-up telephone calls. From the checklist questionnaire and the basic outline listed in the original course proposal, Dr. Nichols designed the BEAR course.

Learner Outcomes. Within the General Guidelines for Classroom Teachers that was eventually published as part of the course materials, there was a section on "Learner Outcomes." The manual listed twenty-five outcomes for "Reading," four outcomes for "Writing," and four outcomes for "Speaking and Listening." These outcomes were the same as those of the Oklahoma State Department of Education and were used as a guideline in the designing of the structure the course would follow.

The "Reading Learner Outcomes" were:

1. The student will use word attack skills in the development of word meanings appropriate for his/her level and content area.
   Descriptive Statement: Emphasis is on the skills involved in learning word meanings: Using context clues, recognizing informal multiple meanings, word derivations and origins, and definitions affixes.

2. The student will be able to recognize unknown vocabulary words by using context clues and structural analysis.
   Descriptive Statement: Emphasis is on understanding the meanings and relationships of the other words in the sentence and also the meaning of word parts such as suffixes, prefixes, root words, and compound words.

3. The student will understand and use figurative expressions.
   Descriptive Statement: Emphasis is on understanding and using similes, metaphors, and idioms.

4. The student will become competent in the methods and mechanics of word meaning study.
   Descriptive Statement: Emphasis is on use of glossaries, dictionaries and their application to achieve competency in the methods and mechanics of word meaning study.

5. The student will find the main idea in the paragraph or selection.
   Descriptive Statement: Emphasis is on the ability to locate the main idea and formulate and appropriate title for a selection.

6. The student will recognize and remember details.
   Descriptive Statement: Emphasis is on the ability to relate the specific details of what has been read to the main idea and identify the sentence containing the answer to a question.

7. The student will be able to visualize a scene from a printed description.
   Descriptive Statement: Emphasis is on the ability of visualize a written passage.

8. The student will arrange ideas in sequential order.
   Descriptive Statement: Emphasis is on the ability to read and arrange events in their proper order.

9. The student will be able to predict logical outcomes.
   Descriptive Statement: Emphasis is on reading a part of a selection and predicting a probable ending or outcome.

10. The student will be able to draw inferences from all forms of communications.
    Descriptive Statement: Emphasis is on taking what the author has stated and being able to discern meanings that are implied.

11. The student will be able to distinguish between fact an opinion and/or fantasy.
    Descriptive Statement: Emphasis is on the ability to recognize the difference in what is factual, what is personal feeling, and what is make-believe.

12. The student will discern the author's purpose and motive.
    Descriptive Statement: Emphasis is on whether the author has written to entertain, inform, persuade, defend, or expose. Clues to these intentions may be tone, diction, the author's bias and structural pattern.

13. The student will recognize the difference between fiction, non-fiction, biography and science fiction.
    Descriptive Statement: Emphasis is will be on distinguishing and identifying written work that includes fiction, non-fiction, fantasy, and reality.

14. The student will be able to identify cause and effect.
    Descriptive Statement: Emphasis is on the ability to discern word clues which indicate cause or effect.

15. The student will understand the basic methods an author used in the creation of the characters, plot, setting, climax, and conclusion.
    Descriptive Statement: Emphasis is on is on developing characterization through speech/dialogue and action; the plot is a progression of the theme of the selection with a climax and outcome.

16. The student will identify elements of literary style.
    Descriptive Statement: Emphasis is on learning the major elements of literary style such as climax, rhythm and rhyme, figurative language, and humor.

17. The student will be able to compare ideas obtained from various sources.
    Descriptive Statement: Emphasis will be on the ability to compile information from different sources.

18. The student will be able to use textbook aids.

Descriptive Statement: Emphasis is on the use of the table of contents, index, glossary, appendix, etc. in textbooks and reference books.

19. The student will be able to do productive work by using appropriate study skill techniques.
Descriptive Statement: Emphasis is on using the thesaurus, catalogs, almanacs, atlases, maps, globes, table of contents, appendixes, graphs, diagrams, indices, dictionaries, bibliographies, encyclopedias, and footnotes; and using the library to organize notes on topics from various sources in outline form.

20. The student will react rationally to various kinds of print and non-print media.
Descriptive Statement: Emphasis is on using various kinds of media for specialized information-- video tapes, films, recordings, computer software, interviews, newspapers, textbooks, records, and a variety of live performance.

21. The student will acquire information from reading materials which pertained to survival.
Descriptive Statement: Emphasis is on the ability to read and understand necessary data required for adult livelihood such as application forms, labels, schedules, directories, recipes, telephone directories, warranties, highway signs, and utility bills.

22. The student will be able to follow written directions.
Descriptive Statement: Emphasis is on the ability to understand what is required and follow through with the task.

23. The student will be able to adjust his/her reading rate to the purpose for reading and the difficulty of the material.
Descriptive Statement: Emphasis is on the ability to know when to change one's reading rate to adapt to the material and need.

24. The student will improve his/her problem-solving abilities.
Descriptive Statement: Emphasis is on the ability to integrate computer software, video and print in a decision-making process and become familiar problem-solving applications of computers.

25. The student will be encouraged to cultivate a desire to read as a leisure activity.
Descriptive Statement: Emphasis is on providing an opportunity to examine selections within the student's interest, capabilities and experience.

The "Writing Learner Outcomes" were:
1. The student will be able analyze an organize printed material.

Descriptive Statement: Emphasis is on outlining, note taking, summarizing, etc.

2. The student will use the process approach to composition.
   Descriptive Statement: Emphasis is on prewriting, composing, revising, proofing, editing, and sharing the final product.

3. The student will construct paragraph using appropriate paragraph patterns.
   Descriptive Statement: Emphasis is on developing the personal essay, the expository essay, and the narrative.

4. The student will edit writing for grammatical errors.
   Descriptive Statement: Emphasis is on editing for correct spelling, complete sentences, variety in sentence structure and word choice, capitalization and end punctuation on his/her own writing or the writing of others as a peer reader.

The "Speaking and Listening Learner Outcomes" were:

1. The student will be able to follow oral directions accurately.
   Descriptive Statement: Emphasis is on the ability to concentrate on what is being said and to follow through.

2. The student will be able to analyze and organize materials presented orally.
   Descriptive Statement: Emphasis is placed on the ability to recall information in proper order, to select main ideas and details, and to correctly respond to the oral information.

3. The student will be able to identify points which need clarification.
   Descriptive Statement: Emphasis is on identifying areas where more information is needed and formulating questions to obtain the answers.

4. The student will be able to use the conventional forms of oral language.
   Descriptive Statement: Emphasis is on the ability to perform prose, poetry or drama effectively for a variety of audiences.

(General Guidelines for Classroom Teachers, 1990-1991)

Goals. The main goals of the BEAR course were: to make a difference in students' reading and comprehension skills and to help enhance the self-esteem of the students participating in the course. Dr. Nichols believed that a student's self-esteem was the key to success. If students had a high self-confidence level, they would be confident enough to take more of a risk and push themselves to achieve quality work. The long term goals of the BEAR course were to:

- raise the reading rate and the reading comprehension percent of the students participating in the course.
- lower the drop-out rate.
- give the students a firm base of knowledge to prevent illiteracy.

Materials and Equipment. The Arts and Science Teleconferencing Service published a list of the equipment required to participate in the "Basic English And Reading" program:

1. Satellite Equipment:
a. Satellite Dish
b. Satellite Signal Receiver
c. Television Monitor
d. Videotape Recorder

2. Computer Equipment:
a. Apple IIe or Apple IIgs Microcomputers

3. Telephone:
a. One Two Way Speaker-phone

4. Textbooks:
a. Sights and Sounds. Richard Allington et al, 1988, Scott, Foresman and Company, 1900 East Lake Avenue, Glenview, Illinois 60025.
A language textbook on the fifth - sixth grade reading level, eighth grade interest level.

b. Building Real Life English Skills. (Second Edition) Carolyn Morton Starkey and Norgina Wright Penn, 1989, National Textbook Company, 4255 West Touhy Ave., Lincoln, Illinois 60646-1975.
A practical application textbook using English skills in everyday situations such as reading labels, using maps, directories, references and charts, understanding contracts and warranties, and following directions.

5. Software:
Program and Producer:
a. Reading- "Reading Comprehension"
Hought-Mifflin
b. Excel-A-Read
American Educational Computer, Inc.
c. Children's Publishing Center
The Learning Company
d. History Mystery/ Big Nap (Twistaplot)
Scholastic
e. Where in the World is Carmen San Diego?
Broderbund
f. Mystery House
Public Domain
g. Process Domain
Scholastic

h. Packet for the novel- books, computer programs, movie, audio tapes
I. Solutions Unlimited
Public Domain
j. Amazing Reading Machines
k. Amazing Reading Machines IV
l. Word Munchers
m. Oregon Trail
n. Oh Deer!
o. Jenny's Journeys
p. Market Place
q. Show Time
r. Dataquest - 50 States
s. Sky Lab
t. Miner's Cave
u. Odell Lake
v. Time Navigator
MECC

Teaching Partner. According to Dr. Nichols, the "Teaching Partner" was the most important element of the course. "The Teaching Partner set the stage of the classroom. If the in-class teacher were dedicated to the abilities of the program, the learning objectives would be achieved." (Nichols Interview, 10/16/91)

The following guidelines for the role and qualifications of the teaching partner in BEAR were included in the Arts and Sciences Teleconferencing Service (ASTS) course catalog:

1. ASTS prefers the Teaching Partner has a background in a field related to the subject they will teach. It is desired that Teaching Partners in the Basic English and Reading course are certified in Language Arts.

2. ASTS prefers that the Teaching Partner is in the classroom every day supervising and motivating the students. Hopefully, the positive attitude of the Teaching Partner will reflect on the class and help the students become more successful.

3. Students taking ASTS courses may need to contact the instructor of the course. If the student has a question, there are three different times a student can call the toll free number:
   a. during the live broadcast; or
   b. during the professor's office hours; or
   c. by becoming a host school and interacting with the professor during the entire broadcast.

   The toll-free telephone number for BEAR was 1-800-633-1179 (All States).

4. The Teaching Partner is responsible for the set-up of all the written and computer information used in the course. This information as well as all equipment and supplies must be ready when the ASTS broadcasts start in late August.

   The Teaching Partner needed to be familiar with the basics of the computer software used in the course.

5. The ASTS professor offers grading guidelines, but the Teaching Partner in the classroom makes the final decision when assigning grades.

6. If the school year begins before the first day of broadcasting, the Teaching Partner can use this time to prepare the students, who may need to "brush-up" some skills before participating in an ASTS course.

7. If a Teaching Partner needs help, teachers' aides are recommended as a good idea. Computer Science and English teachers are good resources for answering questions.

8. There will be times when the ASTS programs will not be seen over satellite due to bad weather, school holidays, or different schedules on both sides. The courses are intended to be live and interactive. The Teaching Partners are responsible to adapt ASTS programs to local needs and provide the maximum benefit of the course to the student.

BEAR Teacher Responsibilities. The guidelines in the General Guidelines for Classroom Teachers were very specific with respect to the qualifications and responsibilities of the Teaching Partner for the "Basic English and Reading" course. The following are taken verbatim from the 1990-1991 General Guidelines for Classroom Teachers:

Qualifications

> "Very simply stated, the success of this class depends on the classroom teacher. That person should be highly motivated, enthusiastic, and supportive of the course. He/she should also be certified in language arts and feel very comfortable with using computers. As some preparation time is needed as well as time to review completed activities and record grades, it is recommended that this assignment be considered part of the classroom teacher's regular teaching load."

Responsibilities

> The classroom teacher will be responsible for the following:

1. Encouraging and motivating students to do their best every day.
2. Duplicating the assignment sheets and any handouts each week.
3. Having the appropriate software out and available for each unit.
4. Making sure that students have equal access to the computers.

5. Determining whether each activity has been satisfactorily completed and initialing the "Assignment Impossible" sheet when satisfied.
6. Spot-checking one activity each week (in addition to the material checked on the broadcast) for a grade.
7. Recording the number of points a student has accumulated.
8. Assigning a grade for those points.
9. Encouraging students to communicate with their television instructor either during the broadcasts or during phone-in hours on Monday, Wednesday, and Friday from 9:00 - 10:00 (am).
10. Tape recording each broadcast for absentees and as a reference.
11. Encouraging leisure reading.
12. Having a backlog of old newspapers and magazines available for some of the activities.
13. Taking care of the computer hardware and software.
14. Obtaining textbooks and library books.
15. Making arrangements for the televised portion of the class, including the television, a VCR (videotape recorder), and telephone links.
16. Sending to the television teacher a printout of student scores from the Excel-A-Read program after Units 1, 10, 20, and 30.
17. Sending to the television teacher creative samples of student writing for the "Student Anthology."
18. Displaying student work within the classroom.
19. Administering quarterly exams and sending the answer sheets to the television teacher to be checked.
20. Sending a class roll to the television teacher by September 15 (date of the month, applicable to year).
21. Sending a group picture of your class to the television teacher by September 15 (date of the month, applicable to year). (possibly include a picture of the school building.)

Grading. Built into the course were some different methods of grading. The assigning of a letter grade was the responsibility of the in-class teacher. According to the General Guidelines for Classroom Teachers, the grade assessment followed this procedure:

> The points a student receives in the Assignment Sheet represent the completion of an activity. If a student sincerely attempts to complete a Level 1 activity, he/she should receive full credit. The Level 2 activities lend themselves to a little more discrimination. When a student asks to have the activity signed and you determine that the quality of work is not satisfactory, you may ask for revisions before you agree to sign for it. In either case, the activities are not checked but scanned for an overall impression. (Nichols Interview, 4/2/92)

During the Tuesday broadcasts some of the sections on the student's Activity Sheets were checked on the air by Dr. Nichols. The classroom teachers had the discretion of deciding how the assignments were graded and what weight to assign to the different assignments.

The purpose of the class was to help students with their English and reading, not to pit them against each other in grade competition. The ideal situation was to provide an environment that motivated students to try. If the student continued to be sincere and try hard, the quality of the students' work was expected to improve.

Another way the "Basic English And Reading" program recognized the efforts of students was by putting some selected pieces of the written work of students into an anthology. The collection of work was created on a desk-top publishing program and bound with an appropriate cover. The students received an anthology once a semester. The anthology was designed to inspire the students to try harder and do better quality work. There were two options for teachers who wanted to send pieces of work in for the anthology:

1. Send a selection of some final copies of papers completed by the students and the BEAR staff published them, or
2. Send the work of the entire class and Dr. Nichols selected the pieces that were included in the anthology.

BEAR Student Responsibilities. According to the General Guidelines for Classroom Teachers provided by the Arts and Sciences Teleconferencing Service, "Basic English and Reading" was "designed for students in the seventh or eighth grade who have difficulty with reading skills." (General Guidelines for Classroom Teachers, 1990-1991) The children involved in the BEAR course were not students who could not read or who needed a reading specialist. The children who could benefit from BEAR were those who were having difficulty reaching the appropriate level of reading skills and needed extra help to reinforce the skills they had to acquire new techniques to rebuild their self-confidence.

Students participating in the "Basic English and Reading" course were responsible for meeting the following requirements, according to the BEAR General Guidelines for Classroom Teachers:

1. Complete as many activities as possible each week to the best of their ability.
2. Use time wisely by remaining on task during class-work days.

3. Schedule homework time for the activities that can be completed outside the classroom.
4. Work with other people by sharing materials, listening quietly during the broadcasts and completing group projects.
5. Have each completed activity initialized by the classroom teacher on the "Assignment Impossible" sheet.
6. Keep each unit's activities organized in chronological order in a folder.

(General Guidelines for Classroom Teachers, 1990-1991)

Program Structure. The BEAR program was designed to be a supplemental course focusing on Chapter 1 schools, for students in grades 7 and 8 who were not reading at grade level. Although the program was designed to be a supplemental course, sometimes the course was the only intensive English and reading program the students received. According to the Oklahoma State Department of Education, the course could not replace a required English course but had to be used by a school as an elective for students.

The program was aimed at two categories of students. The first category included students who qualify for Chapter I funding. The second category was students who were labeled "at risk." The following are formal definitions of the preceding terms:

Chapter I: This is a term used by the federal government to designate schools which receive federal money because of the low socio-economic area they serve. Chapter I funding is used to pay fees for supplies and food for children who can not otherwise afford these things. Chapter 1 also applies to any student who falls below the 50th percentile on any standardized tests. (Nichols Interview, 3/20/91)

"At Risk": This term is used to categorize a student who has characteristics that make it likely s/he will drop-out of high school before graduating. (Nichols Interview, 10/7/92)

Regardless of whether a student is labeled Chapter I or "at risk," she or he is in a disadvantaged situation. The BEAR program was designed to help the disadvantaged student overcome the hurdle of being placed in a regular classroom without the reading skills required for success at that level.

Course Design. As a result of the information Dr. Nichols received from the checklist questionnaire, the information listed on the original proposal about the drop-out

rate, and the fact that students receive reading instruction until the sixth grade, she decided to limit the grade range of the proposed course from 7-12 to 7 - 8. This seemed to be a logical place to begin since seventh grade is the first year of schooling after formal reading instruction ceases. The intent behind the BEAR course was to increase the students' level of reading and English, verbal presentation skills, and self-image sufficient to get them through high school, perhaps college, and basically, life in general.

The BEAR course was based upon a "soft sell," non-high-pressure flexible approach that encouraged students to learn through self-discovery techniques. Some of the characteristics of the course and classroom design are:

- Low light
- A lot of sound
- Learning from sound
- Students learning from each other, not an adult.
- Use of computers, which have been demonstrated to produce good results
- Course style that is exciting to the "right-brain learner"
- Non-structured atmosphere
  (Nichols Interview, 10/16/91)

These techniques do not fit the typical structure of a regular classroom. The different techniques provided the student with a different learning environment that promoted interest in the subject matter being presented. The atmosphere was centered around creativity and exercises that entertain as well as teach. The computer and media usage were ways to entice the learner who needs more than a teacher and a book in a classroom. The course was non-structured to allow the student the freedom to move at his or her own pace within a loose guideline.

According to the General Guidelines for Classroom Teachers for the "Basic English And Reading" course, the students involved with the program can succeed if they only try and keep trying. "'Basic English And Reading' presents reading with a you-can-do-it-if-you-try attitude and the underlying assumption that if students try often enough, they will eventually succeed. It is also based on the premise that at some point, students gave up on reading because it was better to not try and fail than to try and fail. The use of contract

teaching, hands-on activities and technology is no more than a device to motivate students to try" (Nichols Interview, 10/16/91)

Production of BEAR

"Basic English And Reading" (BEAR) was broadcast via satellite from Educational Television Services (ETS) located on the Oklahoma State University campus. ETS is a satellite uplink (transmission) station with three production studios and commercial studio-quality equipment. Dr. Nichols presented the television programs that were part of the "Basic English and Reading" course from one of the three studios. The television programs themselves were called "Reading in Progress." ETS specializes in satellite transmission, but also transmits via fiber optics, telephone lines and microwave antenna.

Educational Television Services. ETS' responsibilities included buying satellite time for the course, offering technical assistance to schools, producing television segments for the program, negotiating broadcast rights for the music videos, making a master tape of each program to be given to ASTS to duplicate for schools that missed a broadcast. ETS also provided the technical staff for the production of the live broadcast. The staff included one director, one production assistant, one audio person, one control room person, one floor director, and two cameramen. Dr. Nichols used an overhead camera to show graphics on homework answers and other information given to the students. This overhead camera was controlled by the ETS director via remote control from the director's booth.

Graphics. The graphics used in the production of BEAR were a two-fold production. The first type of graphic used was the introductions to segments and the second was the graphic that contained the homework information. ETS produced the introductions of the segments and Dr. Nichols produced the homework graphics herself.

She used an Apple IIgs computer to create the homework graphics. Dr. Nichols possessed a collection of graphic artwork on the computer and used the artwork to catch the students' attention when showing the homework graphics.

Telecommunications Aspects. The 1-800 number provided to the teacher and students for questions and comments was controlled by Beverly Nichols, the BEAR Administrative Assistant. During the broadcasts Ms. Nichols would receive the calls and then connect selected calls to ETS staff, who would in turn transmit the calls into the studio where Dr. Nichols and the rest of the students could hear the question or comment broadcast via satellite.

According to Beverly Nichols, she received numerous phone calls from teachers and students weekly, during off-broadcast hours, with questions about the course. There are no logs or other records which document the use of the 1-800 phone number.

BEAR; Five Days A Week. The academic structure of the course was based upon a five-day learning schedule. Even though the television course included only two broadcasts a week, the course was based on much more than the television broadcasts. The structure of the course included:

- Monday, Wednesday, and Friday:
  a. Use Text Books and Materials such as Assignment Sheets
  b. Use Computer Programs

- Tuesday and Thursday:
  a. Watch and participate in the Reading in Progress broadcasts.

Reading In Progress (RIP) was the title of the television part of the BEAR course. The broadcasts began at 9:00 am and ended at 10:00 am Central time on Tuesdays and Thursdays. During this allotted time, Dr. Nichols presented a program based upon the assignments given for that week.

The course was divided into 36 units (with one unit equaling one week of classes). A typical unit included reading and writing assignments and activities for the student to

complete on off-broadcast days. A unit included two different levels of assignments, plus an optional section with two extra assignments for use if the student finished all the assignments and activities in levels one and two. The first 30 units were used during the weeks when the course was on the air, which equaled two 15-unit semesters. The other six units (3 per semester) were completed during weeks without television broadcasts (typically at the beginning or end of the school year when not all schools were in session).

With every new unit a student received a "Student Assignment Sheet." This sheet was titled "Assignment Impossible", after the television drama "Mission Impossible." The sheet was named that because in the television show "Mission Impossible" the group of people trying to complete the mission assigned to them would do everything they could to accomplish their mission. By the end of the show, the group had accomplished their mission. This is the same idea the "Assignment Impossible" was trying to accomplish. Dr. Nichols hoped that using entertaining titles and themes in the curriculum would motivate the students to accomplish all the challenges set forth in the course. The Assignment Sheet listed all the objectives for the unit and the number of points to be earned for completing each activity on the sheet. The student could choose to complete the activities in any order. The Assignment Sheet was designed to be very user friendly. On the front of the sheet was the directions for the unit and the "level 1" activities and assignments. On the reverse side of the sheet was the "level 2" and the optional activities and assignments. Any student in the course was able to look at an Assignment Sheet and know which activities needed to be completed.

All students were assigned the Level 1 activities by the classroom teacher. These activities usually covered very basic reading and grammar techniques. When a student finished an activity on the Assignment Sheet the teacher was required to initial in the blank space provided before the student could proceed to the next activity. Those students who finished all the activities under Level 1 were allowed to go to Level 2 and finish the activities for extra points. The Level 2 activities were more creative and challenged the

students to get past the technical side of writing. The Optional activities could be used as a level by themselves for the students who finished Levels 1 and 2, or they could be used as a substitute for any activity in the preceding levels. All students kept a folder for their Assignment Sheets and completed activities. The completed activities had to be filed in their folders in the order in which they appeared on the Assignment Sheet. According to the manual, the teachers had the option of assigning Options 1 and 2 to a student who was more capable than some of the other students in the classroom.

BEAR; Tuesdays. A typical unit began with the Tuesday broadcast of "Reading In Progress," the television portion of BEAR. The typical Tuesday program consisted of:

- Checking selected activities from Level 1 work for the previous week.
- Assignment Impossible: discussing Level 1 activities for the current week.
- The Bard of Stillwater- Television segment where a student, usually around the age of the students participating in the course, would read a poem while graphics that depicted the poem's meaning were shown on the screen. This segment was recorded before the broadcast and the student reading the poem was from the Stillwater school district. Poetry was used to expose the students to this form of writing and to quiz the students about content and hidden meaning.
- RIP-TV- A skimming exercise using the lyrics of a music video. The music video was shown on the screen with the words of the verse superimposed on the bottom of the screen. Certain words were highlighted to teach students about parts of speech - e.g. - subject, verb, noun, etc.
- Theater of the Mind- A segment that required students to listen, and only listen, to segments from old radio shows. This segment was intended to increase the students' listening skills. When the segment finished the students were asked about the subject matter in the segment.

These five areas covered a majority of the course objectives. The television broadcasts taught reading, visual and listening skills.

On broadcast days Dr. Nichols often asked for students to call her while she was on the air. There were two reasons students would call Dr. Nichols: to answer specific questions or to win a prize. The calls by the students were intended to help reduce some of

the distance between the television instructor and the students that is characteristic of distance education. Dr. Nichols believed that students' self-confidence could be enhanced by their call-in experience. Each class participating in the BEAR course was required by ASTS to have a telephone accessible to the student. The on-air calls were controlled by Dr. Nichols' assistant Beverly Nichols who screened and limited the calls allowed during the broadcasts.

BEAR; Wednesdays. On Wednesday, the students would normally begin work on the Level 1 activities. Those activities usually followed this pattern:

1. Reading about 8 pages and answering comprehension questions in the Sight and Sounds textbook or reading about 12 pages in a novel and answering questions on a computer disk;
2. Reading and answering questions about a life skill in the Building Real Life English Skills textbook;
3. Using a computer program in the "reading series" to reinforce a reading skill;
4. Using the EXCEL-A-READ computer program to build reading rate and comprehension;
5. Completing a logical thinking activity, many times on the computer and many times involving writing.

BEAR; Thursdays. The Thursday RIP broadcasts were similar to the Tuesday broadcasts. On Thursday's broadcast, the discussion centered around Level 2 exercises instead of Level 1, and a video called "In Other Words" was shown which introduced famous authors and short stories to students. On Thursdays special recognition was given to individual students and schools. Throughout the semester site teachers were asked to send in completed work from students. On Thursdays Dr. Nichols showed on the air a selection of the works that had been received. This gave public recognition to students doing good work.

BEAR; Fridays and Mondays. On Friday and the following Monday of each week the students worked on the rest of their assignment sheets; after Tuesday's broadcast, the students filed the previous week's completed work. The completed work was filed

according to the activity sheet and the point totals received for work completed was marked on the assignment sheet by the student.

For the purpose of exposing students to notable literature, the last 12 weeks of school were spent reading a novel. The students were assigned weekly reading assignments and answered comprehension questions about the novel on a computer disk. The reading skills presented in the Sights and Sounds textbook were adapted to the discussion of the novel. Toward the end of the course, a videotape of the movie based on the novel was sent for viewing during the week RIP ended its broadcasts for the school year.

Modifications From Original Design. The preceding information on the BEAR design was based on the structure of the 1992 - '93 course; however, the structure was not always the same from year to year. Some segments used during the first year of BEAR's existence (1989-90) were deleted at the end of the year. After the Spring semester of 1990 Dr. Nichols invited some teaching partners from Oklahoma to an evaluation session in Oklahoma City. The teachers invited had also served on the Advisory Committee that designed the original course. The teachers who attended the evaluation session were:

Patricia Cline
Teacher
Jones Public Schools
Jones, Oklahoma

Joy Wald
Teacher
Hobart Middle School
Hobart, Oklahoma

Janice Decker
Teacher
Cashion Public Schools
Cashion, Oklahoma

Mike Almondinger
ETS Producer/Director

These four educators along with Dr. Nichols examined and evaluated every unit in the course, including the broadcast segments. "The focus of this group was to determine what segments were and were not effective". (Nichols Interview, 4/21/92)

One organizational item was added to the broadcasts for the purpose of cataloging videotapes. The unit information and the day it was presented appeared 30 seconds before RIP began its broadcast for the day. Two segments were deleted from RIP: Books In The Bathroom and Reading For A Reason. Books In The Bathroom was based on a series of books including short stories. The segment consisted of some seventh and eighth grade students from Jenks, Oklahoma acting out skits in a bathroom based on these short stories. The skits included some "bathroom humor" and some "silly" ideas. The segment was dropped because the BEAR students "had split reactions. The students who liked the segments, loved them and those who didn't like the segments, hated them". (Nichols Interview, 11/25/92) The segment was also eliminated because of the cost of the book set. Reading For A Reason was a videotape produced by the Agency for Instructional Technology (AIT) that presented short stories with skits. The segment was deleted because the students did not like the central character who presented the story. Dr. Nichols thought the material and the series were well done and of high quality.

The book reports were dropped from the course and replaced by having the students read a novel during the last twelve weeks of the BEAR course. The evaluation group submitted a list of possible novels to be used in place of the book reports and Dr. Nichols selected one from that list. Dr. Nichols selected the novel The Outsiders by S. E. Hinton. The novel was chosen because of the depressed small town setting in the story and because the novel had been made into a motion picture that was available on videocassette. During the time the students were reading the novel, the series Famous Authors/Famous Stories was presented to the classes.

The final change was in some of the exercises in the units. Some of the Level 1 units were not being finished because they were too long. When the students couldn't

finish the Level 1 assignments they were frustrated and lost some of the drive to work on the following units. Dr. Nichols shortened the suggested units and moved some of the Level 1 exercises to Level 2 and deleted some of the others. All of the recommendations made by the evaluation group were completed during year two of the course and the course remained basically the same through its final year of delivery in 1992-93.

BEAR Participation. Throughout the life of the course, several states and schools participated in the BEAR course. In the four years of its existence the course enrolled 2706 students and 178 schools. Some of the participating schools subscribed to the course for more than one year. Table VI gives a breakdown of the number of students, schools, and states that participated in the course between 1989 - 1993 (Table VI on page 80).

In the course of the four years of its operation, BEAR enrolled students in the following states:

Arkansas
Alabama
Arizona
Colorado
Kansas
Louisiana
Missouri
Mississippi
Oklahoma
Oregon
Tennessee
Vermont
Wisconsin
West Virginia
Wyoming
Washington DC.

Demographics. During the first year of BEAR, Dr. Nichols compiled a set of statistics on the ethnicity of the students who participated in the course. Out of the 450 students at the 26 sites receiving the course, 10% were Native American, 42% were African American, and the remaining 48% were a combination of White - non Hispanic and other nationalities.

TABLE VI

BEAR COURSE NUMBERS

Years	# of students	# of schools	# of states
1989 - 90	450	26	4
1990 - 91	1042	64	9
1991 - 92	645	44	10
1992 - 93	643	43	9
4-year Total	**2706**	**178***	

***Schools participating in multiple years are counted again for each year of their participation.**

Since one of the important groups to be served by the course were children who were educationally disadvantaged as determined by their qualifying to receive Chapter I funding, Dr. Nichols also paid close attention to the number and percentage of Chapter I schools receiving the course. Of the 26 schools that received the BEAR course, 22% were Chapter I funded schools.

In the following three years the BEAR course was offered, Dr. Nichols did not request the above-mentioned demographic information from the receiving sites. Only the number of sites and students were recorded.

Pre- and Post-Tests. Dr. Nichols believed that the goals of the course were being achieved because of the increase each year in the reading rate score and the reading comprehension score of the students participating in the course. Every week of the course the students used a computer software program titled "Excel-A-Read" that helped to build their reading (words per minute) and reading comprehension (percentage of questions answered correct out of 100 percent) rates. On weeks number one (1), ten (10), twenty (20), and thirty (30) the students tested themselves via the computer and those scores were submitted to OSU to create an average. This gave an overall picture of the progress each student had made throughout the course. Scores were then compiled by school and a sample of those schools and students were chosen randomly out of the total number of schools and students, and a chart was made showing the number of schools and a percentage of students selected out of the total enrolled number. The chart then showed the beginning and ending reading and comprehension rate, and the gain over the year. The chart was as follows on page 82.

At the end of every year there was an increase, overall, in the words-per-minute and reading comprehension rates. Dr. Nichols stated in reference to the statistics, "Some students peaked and then slipped back (in their scores) because after they peaked, there was a natural lack of initiative" (Nichols Interview, 11/25/92)

TABLE VII

WORDS PER MINUTE AND READING COMPREHENSION
PERCENTAGE PRE- AND POST-TEST RESULTS

School Year	Number Schools	Number Students	Before W.P.M.	After W.P.M.	Before % Comp.	After % Comp.	Gain
1989-1990	7/27	64/361 17%	163	230	62%	81%	66 wpm 19%
1990-1991	5/64	99/1042 9%	119	178	57%	75%	59 wpm 18%
1991-1992	20/44	238/660 36%	135	172	58%	73%	37 wpm 15%
1992-1993	NA	NA NA	NA	NA	NA	NA	NA NA

A goal for ASTS, according to Dr. Nichols, was "keeping the course on the air." Money was a factor in ASTS' ability to achieve this goal since without sufficient resources to pay the bills, the course could not proceed. The Star Schools grant funded a developmental year for the course and the operating costs for the first year of production (1989-90). The subscription fees collected during 1989-90 were, by agreement of the Federal Government, held to support the course in subsequent years. These first-year fees, supplemented by grant funding from the State of Oklahoma during 1990-91, 1991-92, and 1992-93, and by the subscription fees received during those three years provided just enough funding to keep the BEAR course on the air. However, if the course were to lose the funding provided by the State of Oklahoma, it would have to pay its yearly operating costs strictly from subscription income, which would require at least sixty subscribing schools. As can be seen by the information in table IV, BEAR subscriptions had dropped to 44 and 43 schools, respectively, in 1991-92 and 1992-93.

Cancellation of BEAR and Fate of Other ASTS Courses

The 1992-93 school year was the final year of the broadcast of the BEAR course. In January, 1993, Dr. Nichols announced that she intended to retire at the end of the school year. A replacement could be hired to continue to teach the course for grades 7 and 8 and to continue to develop a companion course for grades 5 and 6, whose development costs were being funded by grants from the U.S. Department of Education and the Challenge Foundation. However, Dr. Nichols' retirement presented ASTS with the opportunity to assess the short- and long-term viability of the course. As a result of this assessment, the decision was made in February, 1993, to discontinue the grade 7 and 8 course after the conclusion of the 1992-93 school year and to discontinue the development work on the grade 5 and 6 course.

The "Basic English and Reading" course had never, with the exception of one year, been able to support itself through subscription income alone. In its first year of operation, 1989-90, subscription income totaled $ 76,845; expenses were $ 223,339. The difference was provided from funds which OSU received directly through the Star Schools grant. Similarly, in 1990-91, subscription income totaled $ 210,190 (and even the subscription income in the first two years of the course was indirectly but significantly affected by the Star Schools grant, since schools in Alabama and Mississippi were provided with grant funds from those state Star Schools projects to purchase their course subscriptions); the course expenses for 1990-91 were $ 205,280.

In 1991-92 and 1992-93, the Star Schools grant was no longer operating. However, OSU was successful in obtaining support from the state of Oklahoma, through its telecommunications grant program, and a significant portion of the grant funds which OSU received were earmarked to support BEAR. In 1991-92, subscription income totaled $ 142,465; and course expenses totaled $ 222,454; the difference was provided by state grant funds. In 1992-93, subscription totaled $ 137,349; and the course expenses totaled $ 210,590; the difference was provided by state grant funds.

Looking toward 1993-94, the prospects for making BEAR financially self-supporting were not good. The number of schools subscribing to the course had actually declined from a high of 64 sites in 1990-91, when Star Schools grant paid for the subscriptions of many schools in Alabama and Mississippi, to a low of 43 sites in 1992-93. The future of the telecommunications grant program administered by the Oklahoma State Department of Education, which had provided crucial funding for BEAR in Oklahoma, was in question as Oklahoma faced significant revenue shortfalls at the state level and state agencies were told to prepare for 10% cuts in their budgets for the following year. Given the uncertainty of both the subscription income and grant support, the decision was made to cancel BEAR.

A number of course cancellation decisions were made either in 1992 or 1993, all of them related to the precarious financial situation of the satellite courses. The 1992-93 school year saw Trigonometry/Analytical Geometry, Applied Economics, Russian I and II, AP Chemistry, and AP American Government dropped from the schedule, and the 1993-94 school year saw AP Calculus and "Basic English and Reading" eliminated. The quality of the courses was never questioned. The decisions were financial ones. (Martin Interview, 10/15/93).

ASTS in 1993-94 offered a schedule that paralleled that offered in 1988-89. German I and II and AP Physics, the three earliest and most financially healthy of the ASTS courses, were still on the schedule. In addition, a German III course was added. The format of the German II course was different from that of German I and II. The German III course included one live interactive broadcast per week as compared to the two broadcasts in the German I and II courses. To complement the one broadcast, the toll-free telephone in the classroom is used as a medium to carry one-on-one conversation practice sessions between the students at each school and professor.

Chapter Summary

This chapter has presented a detailed description of the development of the BEAR course from the fall semester of 1988, when Star Schools funding was awarded, through the cancellation of the course in the spring semester of 1993. The chapter started with the description of how BEAR came to be included in the ASTS list of course programming through the funding of the Midlands Consortium Star Schools Grant (which provided the majority of the funding) and included a detailed description of the BEAR course itself. This chapter has also described the people involved with the course from its beginnings to the present and discussed how the course was structured, how the curriculum was selected, and what the objectives of the course were.

Have the intended objectives of the course been accomplished? The teacher of the BEAR course believes that they have been achieved in some notable areas, but there is little existing evaluation data to support this belief. The purpose of this study was to provide a detailed description of the design and operation of the course rather than conduct original research to assess the effectiveness of the program.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Overview

This chapter briefly summarizes the findings recorded in chapter four and then discusses the significance of the study and its findings. The conclusions which can be drawn from this descriptive case study are re-stated and recommendations are made for future research regarding the BEAR course and distance education in general, particularly programming aimed at students in grades K-12.

Summary

On a Tuesday morning at 9:00 a.m. Central time in late August 1989 the "Basic English And Reading" (BEAR) course became a reality. The televised segment Reading In Progress (RIP) led off the week of study as it was to do for the next four years. On every Tuesday and Thursday of the course schedule, students participating in the BEAR course were in their classrooms watching Dr. Joyce Nichols present a fifty-minute program on the basic elements of English and Reading. Whether the students watched the live satellite program or watched it by tape delay, the students were enrolled in and received credit from their school for their participation in the course.

The BEAR course was made possible through a Star Schools grant provided by the United States Department of Education. In 1988 a consortium comprised of schools, institutions of higher education, and educational organizations in Kansas, Oklahoma, Missouri, Mississippi, and Alabama, which called itself the Midlands Consortium, was organized to submit a proposal for funding through the Star Schools competition. The original proposal submitted to the U.S. Department of Education was returned to the

Consortium with a list of questions that needed to be answered before the proposal would be funded. Within that set of questions was one that prompted the Midlands Consortium, specifically Oklahoma State University, to respond by committing itself to the development of what would become the BEAR course. The question asked the Consortium to be specific regarding the programs it offered or would develop that would serve "Chapter I" and "At Risk" students--students the Star Schools legislation had targeted. The BEAR course was proposed in response to this question. The Midlands Consortium eventually received $9.635 million over a two-year period to fund the variety of activities which it had proposed.

The BEAR course was developed, marketed, and offered under the auspices of the Arts and Sciences Teleconferencing Service (ASTS) at Oklahoma State University (OSU), which is located in Stillwater, Oklahoma. ASTS provides telecommunication courses via satellite transmission to schools throughout the United States. Satellite was chosen as the delivery medium because of its single-point to multi-point transmission capabilities. The satellite transmission provides live full-motion video and audio to receiving schools. All the courses offered through ASTS require a speaker phone to be available to the students in each of the remote classrooms for two-way audio interaction with the satellite teacher. ASTS is an educational programming service that uses the technology resources of OSU's Educational Television Services, also located on the campus in Stillwater. ASTS's primary responsibility was to be the managing and marketing agent for the BEAR course. ASTS is under the direction of Dr. Connie Martin, Director of Arts and Sciences Extension. Dr. Martin served as one of the co-writers and developers of the Midlands Consortium Star Schools grant proposal submitted for the multi-state funding.

The BEAR course was designed to help seventh and eighth grade students read and comprehend information at a level to their grade. The curriculum of most K-12 schools provide for instruction in remedial English and language skills through the sixth grade. The following years build on the knowledge base established in those first six years.

Students who do not achieve a strong knowledge base of these essential skills are sometimes left behind as they move into the seventh grade, and some eventually drop out of school completely. The BEAR course was designed around the long-term goal of reducing the drop-out rate by strengthening remedial English skills while also strengthening students' self-esteem and self-confidence that they have the ability to succeed with the educational challenges that will face them in the future.

The BEAR course was based on a two-day television instruction design with the other three days available for students to work individually to complete assignments on the computer, or in the textbook or novel. Tuesday and Thursday of every week were the broadcast days when the students watched Dr. Nichols present the weekly lessons. Wednesday and Friday were primary work days when students completed the assignments given on either one of the broadcast days. Monday was set aside for students to complete any unfinished work or watch the broadcast from the previous week if the student had missed class on one of the broadcast days.

BEAR, as all ASTS courses, required that there be a teaching partner in the receiving site classroom available to answer the students' questions and to provide structure and management within the classroom. Dr. Nichols encouraged schools to use teaching partners who were certified in English or Language Arts. The teaching partner could contact Dr. Nichols or Beverly Nichols, assistant to Dr. Nichols, via a 1-800-number between eight and five, Monday through Friday. If the teaching partner was unable to reach anyone at the number, a recording took the teacher's message and Dr. Nichols or Ms. Nichols returned the call at a later time. This toll free number was also used during the television broadcast for responses from students when Dr. Nichols asked for a response or comment from the students participating in the course.

The schools receiving BEAR needed the following equipment to participate in the course: satellite receiving dish system, television monitor, videocassette recorder, personal computers, and a speaker telephone in the room for student access. Various textbooks and

software were also required for participation in the course. The classroom teacher was given permission to videotape each broadcast with the understanding that all the tapes had to be erased at the end of the year.

The BEAR course existed within ASTS's programming schedule from 1989 through the end of the 1992-1993 school year. For four years this course was transmitted from the studios of ETS on the campus of OSU. The course was dropped from the program schedule because of a decrease in enrollment and the retirement of Dr. Nichols. ASTS continues to offer some of the other programs that were developed prior to or concurrent with the BEAR course. However, several courses, in addition to BEAR, have been dropped from the schedule because the enrollments were insufficient to support their delivery, including Russian I and II, Applied Economics, Trigonometry/Analytic Geometry, AP Chemistry, AP American Government, and AP Calculus.

Significance of the Findings

Many practitioners who are involved with the design and delivery of educational programs do not have the time to provide complete descriptions of their programs to those interested in knowing more about them. Sometimes a program will be the subject of a paper presented at a conference, but the dissemination of the information is limited to those in attendance. When information on a program is found in a journal article or other written form, space constraints often limit the information provided to only the highlights of what is happening at present, with little attention to an examination of the history of the program, few details regarding the program's content and format, and often no information about costs and budgets.

The significance of this study is that it provides a detailed written retrospective of the development and operation of a distance education course that, because of its funding by the U.S. Department of Education's Star Schools competition, stands as a milestone in the use of telecommunications to deliver instruction at the K-12 level. Only 10 organizations have received Star Schools grants since the inception of the program in 1988.

The courses developed with these grant funds are the subject of great interest by educators throughout the country. Yet the information available on them is very limited--e.g., budget information, sketches of content and format, and number of participating schools and students which is included in the annual reports required by the U.S. Department of Education--and not widely available. This study attempted to provide a detailed written account which drew on all the available written documentation regarding the course as well as the memories of those who were involved with it. This documentation provides a base from which others interested in understanding this form of education or in designing their own versions of distance education courses can benefit.

While this study was intended primarily to provide a description of what occurred, it did reveal what would appear to be some of the positive benefits and some of the limitations of distance education. The findings reported in this study show that students did increase their reading rates and comprehension percentages as measured by the tests they completed. These tests are the only quantitative scoring information available to judge the learning effectiveness of the course. The tests did not indicate what specific areas of the course might have contributed most to the increase in the test scores of specific individuals or the group as a whole.

There is also a question about the medium that delivers the course to the students at the schools. The BEAR course is delivered by satellite, and the only two-way interaction the students have with the instructor is through a speaker telephone, if the school complied with the ASTS requirements. As stated above, from the test scores it would appear that the course was effective in teaching its subject matter. However, out of all the schools receiving the course, two-thirds of the schools did not view the broadcasts live but watched them later on videotape, at a time more convenient to the individual school's schedule. Only one-third of the schools received the course live and had the possibility of interacting with Dr. Nichols while she was on the air. Is satellite the answer to distance education in the elementary and secondary schools? The answer is not clear from this descriptive case

study, from the test results reported in this study, nor from the literature available at present.

On the issue of cost, this study has documented that the development, presentation, and operation of a telecommunications-based, satellite-broadcast course such as BEAR can be expensive. The BEAR course was given life through the Midlands Consortium Star Schools grant. The money from the grant provided for the development and operation of the course through the first two years of production. The grant even allowed ASTS to keep any subscription money generated during the grant period (i.e., schools paid a regular subscription price to participate in the course; they were not provided the course free-of-charge) to help support the course when the Star Schools money was exhausted. This issue of money is significant because if someone wanted to start a program similar to ASTS or the BEAR course, they would need significant monetary resources up front to begin. ASTS estimates the start-up costs for a course to be approximately $250,000, and the annual operating costs can vary between $170,000 and $250,000.

Recommendations For Research

The issue of effectiveness is still a question that has not been fully answered pertaining to the BEAR course. This case study reported on the evaluation completed by Dr. Nichols, which showed an increase in the reading rate and comprehension scores of students, but there has been no follow-up or monitoring of the students after they completed the course. Relevant questions for a follow-up study would include: How did students perform in other classes in subsequent years--particularly those involving significant writing and reading? Did all the students involved with BEAR finish high school?; if not, how many dropped out of school and how does that compare with the average drop-out rate of the particular schools involved? Did these students go to college? These might be some questions to ask in further research on the course itself.

Across all the Star Schools grantees, as well as others involved in providing distance education courses, there remains a scarcity of evidence documenting the

effectiveness of this form of educational delivery and pinpointing the features of it that contribute most or least to its effectiveness. What are the advantages and disadvantages of satellite-based delivery systems for K-12 students; how do these compare with the advantages and disadvantages of land-based two-way video systems? These questions and others need to be asked about computer delivery systems, interactive full-motion video, microwave, and cable systems with and without talk-back capabilities.

Interactive computer delivery systems and two-way interactive full-motion video seem to be systems of the choice for the future. Use of these systems is growing because the teacher can talk to, see, and listen to the receiving site(s) and the receiving sites(s) can talk to, see, and listen not only to the teacher but also to the students at the other remote site(s). These systems usually are smaller in size (i.e., in the number of schools linked together) and use a land-based fiber optic network. Interactive computer systems are becoming more popular because of the cost effectiveness they bring with them. The equipment needs are fewer and less expensive and the options are greater. Research could pinpoint the circumstances under which each system is more effective and more cost efficient.

Conclusions

Based on the research conducted and the results provided by the BEAR course, students can receive instruction and learn through the medium of live television via satellite transmission. The students participating in the BEAR course appeared to learn through the teaching method designed and employed by Dr. Nichols.

Other studies show that students can learn at a distance and usually do as well as students in a traditional classroom setting. However, the process of being taught by a person who is in another state through the medium of television with the telephone as the only link to that teacher continues to be less personal than the traditional classroom setting. These studies have also noted that students must be highly motivated to succeed in distance education courses. Motivation appears to be an area where the BEAR course succeeded

during its four-year existence. The twice a week scheduled broadcasts of Reading In Progress and the other three days of independent learning mixed with creative curriculum and use of technology made the BEAR course successful in terms of student satisfaction and learning and teacher satisfaction. It must be noted that the students enrolled in the BEAR course had been identified as not achieving at the academic level appropriate to their grade level, which placed them at a disadvantage from the beginning. Many of the students participating in the course also qualified for "Chapter I" funding and were placed in an "at risk" category because the probability of their dropping out of school was higher than the probability of their graduating from high school. These students, most typically, had a low self-esteem and self-confidence level mixed with low motivation; these factors produce students who have no desire to learn. However, through the BEAR course, these disadvantaged students showed progress in the areas of reading rate and the comprehension of what was being read.

An area that needs to be explored is cost-effectiveness of satellite programs during its four-year existence. In only one year did the BEAR course receive enough money through subscription fees to cover the direct costs of the course. Teaching a course by satellite is not an inexpensive method. The costs for the studio and personnel to operate the equipment added to the costs of purchasing time on a satellite for an entire year can become very expensive. There is also the cost of the people involved in the instruction of the course--e.g., Dr. Nichols and Beverly Nichols. The other people involved in the marketing and managing of the ASTS program are also a part of the expenses incurred by the BEAR course as well as the other courses offered through ASTS. When a large amount of income is required to cover the costs of a delivery service such as ASTS, the income must be generated by the subscription fees, and the schools are the ones who must pay the costs of the programming. When the fee is too expensive, or the value of the product is deemed to be not essential to the school, schools cease to subscribe to the course. The fee for the BEAR course was not exorbitant. ASTS, unlike many other

distance education providers, has no required annual membership fee for schools to participate in its courses. Schools pay only for the courses they receive. A non-Oklahoma school enrolling 15 students in the BEAR course, and qualifying for the early-bird discount, would have paid $220 per student in 1992-93 for the BEAR course. The anticipated number of school sites for 1993-94 was below what would be needed to fund the costs of delivering the course, and therefore BEAR was canceled for the 1993-94 school year. The quality of the BEAR course was judged to be excellent by teaching partners, students, and outside reviewers, but not enough schools were going to be enrolled to cover its costs.

The future of the K-12 satellite-delivered courses is in some doubt. Increasingly, schools are obtaining the technology to link themselves in two-way video and audio networks--e.g., fiber optics and microwave links have been used by groups of 6-8 schools to share teachers. With multiple monitors in the originating classroom, the teacher can see the classes of students at all the other schools, and students at the remote sites have multiple monitors to pick up not only the classroom of the teacher but also the classrooms at the other remote sites. These smaller networks of schools that are in relatively close proximity to one another avoid the scheduling problems that plague the large-scale national providers whose programming crosses all the time zones in the United States. The smaller networks also maintain more local control for each school district of programming and other course logistics. Figures on the costs of such systems are difficult to find, and many schools which establish such networks benefit from free or reduced-cost transmission costs for an initial period of time. Only when these systems have been operating beyond the initial free or reduced-cost transmission period will long-term costs be known and able to be reported in the literature and compared.

In conclusion, the BEAR course was judged to be successful in terms of content and format and the learning that occurred by the course designer/instructor, the teaching partners at the remote sites, and the students participating in the course. Using the BEAR

course as an example and this study as a guide, descriptive case studies of other distance education courses should be conducted to document the history of this important development in education. A series of case studies would also provide the framework from which broader-based and more reliable conclusions and recommendations could be drawn to improve telecommunications-based educational systems in the future.

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