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ABSTRACT

The reports presented in this document describe the results of the first 2 years of the Midlands Consortium Star Schools Project (MCSSP) (October 1, 1988-December 31, 1990). The first report summarizes the major accomplishments of the MCSSP, including: (1) the installation of communications satellites at schools in Alabama, Kansas, Mississippi, Missouri, and Oklahoma; (2) the production and delivery of four student credit courses (Basic English and Reading, Russian, and Spanish I and II) and four enrichment courses (genetics, "Moving Out and Moving On," PSAT/NMSQT, and Spanish I); (3) the production of eight courses by Oklahoma State University with indirect Star Schools support (Advanced Placement--AP--American Government, AP Calculus, AP Chemistry, AP Physics, Applied Economics, German I and II, and Trigonometry/Analytic Geometry); (4) provision of staff and professional development courses as well as training materials and conferences; and (5) the completion of research and evaluation activities. This report summarizes the projects by state, and provides 13 appendices with additional project information and materials. The second report, which focuses on the final evaluation of the project, contains the empirical findings of the Midlands Consortium Research and Evaluation Center based on the MCSSP results. This report discusses the chronology of research and evaluation, reviews the literature, and provides statistical data related to the educational effectiveness of communications satellites. This report also provides more than 200 references. The last of the three documents in this set contains the appendices to the final evaluation report. These include evaluation item banks, sample evaluation forms, research agenda, sample requests for proposals, interim papers from selected participants reporting on aspects of communications satellite implementation, survey questionnaires, and needs assessment forms. References are included throughout this section. (DB)

THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT

FINAL REPORT

Submitted to the
United States
Department of Education

As required by
Grant Award R203A80036,
Star Schools Program

THE MIDLANDS CONSORTIUM
STAR SCHOOLS PROJECT

Final Report

Contents

See *Final Evaluation Report : Volumes I and II* for findings of the University of Kansas' Research and Evaluation Center.

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EXECUTIVE SUMMARY

The Midlands Consortium Star Schools Project (MCSSP) is pleased to report that it fulfilled all objectives of the grant specified in the star schools grant proposal (as amended September 16, 1988) and in the Star Schools grant continuation proposal submitted May 15, 1989. The following is a report on the activities and accomplishments of the MCSSF during Year One (October 1, 1988 - September 30, 1989) and Year Two (October 1, 1989 - December 31, 1990). The report assumes that the reader is familiar with the MCSSP grant proposal as amended September 16, 1988, the Year One Final Report, and all quarterly progress reports.

Following is a summary of the major accomplishments of the MCSSP:

1. There have been 287 satellite receiving systems installed at participating schools in Alabama, Kansas, Mississippi, and Oklahoma. Each of these satellite receiving systems is a dual band, steerable system using an unscrambled signal. Many additional systems have been installed in Missouri by the Missouri School Boards Association in conjunction with the Midlands Consortium utilizing non-Star Schools funds. Virtually all of the schools which received the systems in the five partner states are participating in one or more of the student credit courses and many are also participating in educational professional development programming. Additionally, prudent utilization of federal funds has resulted in the ability of the consortium to install 36 additional satellite receiving systems in Kansas from the Year One budget. This was done by using federal funds to leverage local matching funds. These additional systems were ordered and were installed. Included were six demonstration sites strategically located across Kansas.
2. All scheduled satellite programs have been produced by the Consortium and received by participating schools, with one exception. The one exception, *Improving Thinking Skills in the Classroom,* was postponed until the Fall of 1990 due to low enrollment but was produced on the revised schedule beginning September 18, 1990. Of the courses for students produced with Star Schools grant support, the following enrollments were achieved: (a) Spanish I, 120 schools and 1,559 students in 10 states; (b) Spanish II, 30

schools and 120 students in 9 states; (c) Basic English and Reading, 64 schools and 955 students in 11 states; and (d) Russian, 28 schools and 170 students in 13 states. Additionally, the PSAT/NMSQT series was highly successful with 273 schools in 38 states enrolled.

3. Production activities have continued according to schedule for all courses and staff development programs to be produced, resulting in over 200 hours of professional development satellite programs during the project.
4. Training materials and conferences were held which prepared participating faculty and administrators to benefit fully from satellite-based distance learning. A videotape which instructs teachers in the use of the satellite receiving equipment was disseminated.
5. Research and evaluation activities were completed and new insights in the field of distance education were obtained.

The remainder of this report is organized as follows:

1. a summary of the production and delivery of student programming carried out under MCSSP sponsorship;
2. a summary of the staff development programming for teachers and administrators produced and delivered, wholly or in part, with MCSSP funds;
3. a compilation of the equipment purchased with MCSSP funds; and
4. a two volume report of the research and evaluation component of the MCSSP conducted by the University of Kansas' Research and Evaluation Center.

PROGRAMMING

Student Programming

The MCSSP produced four student credit courses with Star Schools grant funds. These courses were: (1) Basic English and Reading [BEAR], (2) Russian, (3) Spanish I, and (4) Spanish II. Four enrichment courses for students were produced including: (1) Genetics, (2) Moving Out & Moving On, (3) PSAT/NMSQT, and (4) Spanish I. Eight additional courses were produced by Oklahoma State University with indirect Star Schools grant support. These eight courses were: (1) AP American Government, (2) AP Calculus, (3) AP Chemistry, (4) AP Physics, (5) Applied Economics, (6) German I, (7) German II, and (8) Trigonometry/Analytic Geometry. The following table summarizes the registrations for these classes.

One indicator of the success of the MCSSP and the need for distance education programs of the type supported by the federal Star Schools funds is the increase in enrollment. From 1989-90 to the 1990-91 school year, MCSSP enrollments increased in 90.1% of the courses.

MIDLANDS CONSORTIUM
STAR SCHOOLS PROJECT
COURSE OFFERINGS

Student Programs

Foreign Language:

COURSE	PRODUCER
German I	OSU
German II	OSU
Russian	OSU
Spanish I	KSU
Spanish II	KSU

Mathematics:

COURSE	PRODUCER
AP Calculus	OSU
Trigonometry/Analytic Geometry	OSU

Science:

COURSE	PRODUCER
AP Chemistry	OSU
AP Physics	OSU
Enrichment Programs	KSU

Other:

COURSE	PRODUCER
AP American Government	OSU
AP Applied Economics	OSU
Basic English & Reading	OSU
Career Education	KSU
College Application Process	OSU
Planning for Next Year	KSU
PSAT/NMSQT Preparation by Satellite	OSU
College Choices/College Costs	OSU
Early Awareness: Pathways to College	OSU

MIDLANDS CONSORTIUM
STAR SCHOOLS PROJECT

STUDENT PROGRAMMING
1990-91 REGISTRATION SUMMARY

COURSE	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF STATES
Basic English & Reading	64	955	11
Russian	28	170	13
Spanish I	120	1,559	10
Spanish II	30	120	9
Subtotal	**242**	**2,804**	
AP American Government *	38	320	10
AP Calculus *	63	360	19
AP Chemistry *	29	185	14
AP Physics *	126	900	18
Applied Economics *	42	630	11
German I *	217	1,800	19
German II *	79	320	13
Trigonometry/Analytic Geometry *	6	50	2
Subtotal	**600**	**4,565**	
Total	**842**	**7,230**	**33**

* Course supported *indirectly* by the Star Schools Project; meets the Star Schools objectives.

PROGRAMMING

Staff Development Programming

MCSSP funding made quality staff development programming available to the numerous rural schools served by the project. Cleveland Hammonds, Superintendent of Birmingham Public Schools, an Alabama Star School, enthusiastically reports, "The opportunities available to the involved schools for on-site live staff development via satellite are innumerable."

In Kansas, the 1990-91 school year saw the development and distribution of an ambitious Staff Development series, with six programs (seven hours) of live, interactive programming produced and uplinked prior to December 31, 1990. By May of 1991, the full series of 13 programs (19 hours) drew participation from more than 3, 000 teachers and administrators in 80 school districts across the country.

The Missouri School Boards Association and their Educational Satellite Network developed programs and teleconferences for school board members, administrators, and educators on a variety of topics. Leadership training, risk management, board candidate training, legislative workshops, and a monthly video-newsletter magazine were produced and uplinked to schools across the state. MSBA/ESN provided support to additional education organizations in developing and distributing video programs and teleconferences to a wide and varied audience, including the Missouri Department of Elementary and Secondary Education, National School Boards Association, Missouri State Teacher Association, University of Missouri-Columbia, and Central Missouri State University.

The University of Mississippi's Office of Distance Learning produced two live, interactive staff development programs. The first, "The Liability of Principals for School Accidents," was targeted for local school administrators and had 104 registrants. "Mississippi Distance Learning Update: A Teleconference for Administrators and Teachers" was the second of their productions.

Oklahoma State University offered 20 diversified staff development programs, 1989-1991. These programs included topics as varied as Pre-School Assessment, AIDS/STD Teacher Resources, Technology Update for Educators: Optical, Computer, Network, and Media, or Improving Teaching at a Distance. Staff Development Programming was received in over 33 states, reaching 6161 participants at 581 schools. See Appendix A for a list of Oklahoma State University's Staff Development Programming and enrollment figures.

MIDLANDS CONSORTIUM
STAR SCHOOLS PROJECT

Staff Development Programs for Teachers and Administrators

COURSE	PRODUCER
Accelerated Schools Pilot Project in Missouri	MSB/ESN
AIDS & STD Teacher Resources for Instruction	KU
Career Development for the Disadvantaged	MSBA/ESN
Career Oriented Modules to Explore Topics in Science	KU
Children's Literature Instructional Development	KU
Citizenship Education Course of Study - Teacher In-service	MSBA/ESN
Classroom Management Techniques	KU
Contemporary Issues for Teachers Working with the Educationally Disadvantaged	OSU
Current Issues in Second Language Teaching	MSBA/ESN
Curriculum Renewal Through Multi-cultural Education	ESN
Decision 91 - Early Childhood Special Education: The Need to Advocate	MSBA/ESN
Early Childhood: Birth to Two Years	MSBA/ESN
Early Childhood Education/Teacher Certification	MSBA/ESN
Effective Administrators=School Effectiveness: Definition and Measurement for Individual Growth	KU
Fearless Math: Teaching Students the Language of Math	KU
FOCUS/Star Schools Update (first Th. each month)	MSBA/ESN
Fun with Economics in the Classroom	KSU
Handling the Physically Handicapped: Teacher Certification	MSBA/ESN
Hands On! Effective Teaching in the Science Classroom	KSU
Hands-On Science for Rural and Small School	KSU
Helping Your Children Think About Careers	KSU
Improving Teaching at a Distance	OSU
Improving Thinking in the Classroom	OSU
Integrating Music into the Elementary Classroom	KSU
Intervention Strategies for At-Risk Students	KU
Introduction to Career Development	KSU
Kansas Career Guidance Update	KSU
Kansas History: Curriculum Development for Teaching the History of Kansas	KU
Literacy through Literature: Books in the Home, the School and the Library	KU
Making It Work: foreign language teaching for the 90's	KSU
Mastery Learning	MSBA/ESN
Microcomputers and Science Education	OSU
NASA Education Videoconference Series	OSU
Parent Education Outreach - Parents as Teachers	MSBA/ESN
Preparing Special Needs Students for the World of Work	KSU
Pre-School assessment	KU
Rural Schools and Economic/Community Development	

MIDLANDS CONSORTIUM
STAR SCHOOLS PROJECT

Staff Development Programs for Teachers and Administrators

COURSE	PRODUCER
Schools, Alcohol & Drugs: Fresh Perspectives on a Persistent Problem	KU
Secondary Science	KSU
Services for Young children with Handicaps: Best Practices That Can Make a Difference!	KU
Social Studies Materials in Early America: 1784-1860	KSU
Special Needs - Parents as Teachers	MSBA/ESN
Students at Risk - A National Perspective	MSBA/ESN
Students at Risk - Prevention & Intervention	MSBA/ESN
Teaching Students (K-12) to Learn	KSU
Technology Update: Optical, Computer & Network Media	OSU
Technology Update for Educators: Multimedia Systems, Satellite Communications, and Planning for the Future	OSU
Tradebooks with a Rural Theme: Enhancing the Rural Lifestyle	KSU
Whole Language: What Makes it Whole?	OSU

EQUIPMENT

One of the major features of the Midlands Consortium Star Schools Project was the purchase and installation of a turnkey package of satellite-recieve downlink equipment in remote, geographically disadvantaged schools and other local education agencies which met specific star schools federal guidelines. Additionally, selected purchases of production equipment were installed at Oklahoma State University, Kansas State University, The University of Mississippi, and the Missouri School Boards Association. A thorough inventory of this major expenditure is detailed in Appendix B.

REPORT ON THE ACTIVITIES OF THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT IN ALABAMA

The major focus of the second year of the Star Schools Project in Alabama was the installation of additional satellite downlinks across the state and implementation of instructional programming in the schools in which those installations were placed. Working in cooperation with Dr. Ron Wright of the Alabama Department of Education, there was an effort to coordinate Midlands installations with those of the SERC and TI-IN projects to provide appropriate coverage, as much as possible, across the state. In addition to the 20 downlinks installed as part of the first year, there were an additional 60 downlinks installed in the state to make a total of 80 installations for the Midlands consortium's Alabama project. The cost of equipment and installation, funding for books, supplies, instructional programming, memberships in the Education Satellite Network, teacher inservice, and computer equipment as needed, was funded from the Alabama budget. There are a number of students across the state receiving instruction in a variety of courses as a result of this project. It is of particular interest to the State Director that there are six middle schools in the city of Birmingham in which students are taking Spanish by satellite. One would need to visit these schools to fully appreciate the value of this for the students, and to appreciate the impact that satellite instruction has on them.

In addition to the work on the installations, the Alabama project did a series of training sessions in several locations around the state, and sent teachers to Oklahoma State University for training. Original materials were developed for the training done in Alabama.

Further work was done in the area of informative materials for teachers, administrators and others in need of orientation to the concepts of technology in the classroom. In the first year of the project when a graduate level course was designed and implemented for a select group of teachers from Birmingham and Bessemer, it was discovered that there was no adequate resource available for use as a text on the concepts of technology in the classroom. In response to this need, a handbook of readings was assembled which was published as part of the second year of the Alabama project. There was a sufficient quantity printed to send to the participants in Alabama, and other interested parties; the remaining copies will be available at no charge, other than postage or shipping costs, while the supply lasts.

A microcomputer lab oriented to training teachers and students to use the Macintosh and related software packages was established in the School of Education as a cooperative venture involving the Apple Corporation, the Dean of the School of Education, and the Star Schools Project. Some equipment was bought for the UAB Continuing Education Center to be available for future programs involving teachers in the area, and will be used without cost for training and other activities for teachers.

As a part of an effort to assess the attitude of the students in their initial perception of the distance learning experience, the Alabama Star Schools office conducted a survey of 75 participants in the program during September of 1989. In November of 1990, a paper based on this survey was presented by Brenda Wilson to the annual meeting of the Midsouth Educational Research Association.

House Bill 435, submitted during the last session of the Alabama Legislature, is intended to provide a source of funding and a structure for the continuation in Alabama of programs involving instructional technology, with an emphasis on the Star Schools type programming. The State Director has worked closely with a member of the House of Representatives to coordinate with the Commissioner of Revenue on the funding source and on getting the bill reported out of the House Ways and Means Committee. There was insufficient time and sufficient confusion in the last session of the legislature that the bill did not get to the floor of the House, but the feeling at this point is that the bill will pass in the next session.

Birmingham and Besemer school systems have submitted summaries of their activities during the two years they have participated in the Star Schools Project. There were also several articles written about the Alabama program in local newspapers.

Some comments from people involved in the Star Schools Project in Alabama provide a positive view of what this program has meant to those commenting:

The instructional program in the Birmingham Public School System has been positively influenced through the use of interactive telecommunications by teachers involved in the Midlands Consortium Star Schools Project. Through graduate courses at the University of Alabama at Birmingham and Oklahoma State University teachers have become more proficient, both as cooperating teachers in satellite programs as well as users of the equipment furnished through the project. The demonstration laboratories at Phillips and Ensley High Schools are excellent facilities for training students and teachers both at the respective schools and for systemwide instructional personnel. The opportunities available to the involved schools for on-site live staff development via satellite are innumerable. We sincerely appreciate the involvement with the Star Schools Project.

Cleveland Hammonds, Superintendent Birmingham Public School

The Star Schools Program means that many students, particularly in small high schools, have the opportunity to take courses not available otherwise, due to lack of teachers or small class enrollments. It has proven to be a very cost-effective program.

Wayne Teague, State Superintendent of Education

The classes offered through the Star Schools project have been a bright spot at our school; the impact Star Schools has made on the Bessemer City Schools in immeasurable.

Harry Debrow, Chemistry Teacher, Jess Lanier High School

My class and I are enrolled in Oklahoma State University's Applied Economics by Satellite through the Star Schools project. We really enjoy learning from the TV lectures and the first hand experience of operating a business. It is more than just a class; it is an experience we will benefit from long after graduation.

Jean Clark, Student, Citronelle High School

In today's society technology is advancing at an astounding rate. Ensley Magnet High School has recognized the need to prepare students to lead productive lives in such a society. The primary objective of Ensley's curriculum is to prepare students to become productive contributing citizens. The ultimate purpose of each teacher at Ensley is to help every student fulfill the school's motto: "Pursuing academic excellence today unlocks the door to opportunity tomorrow." This is what the Star SCHOOLS program has provided for our students.

Charles Warren, Principal, Ensley High School

The Star Schools satellite system is one of the most beneficial opportunities that Tallassee High School has ever been offered. It is and will continue to be our link to the outside world. We are fortunate, indeed, to have been selected to receive the midlands Consortium hook-up, as it enables us to expand our technological horizons into that vast realm usually only afforded by much larger more affluent school systems. Before, we could only wonder about the possibilities available through such a satellite system, but now we can experience university courses, foreign language programs and professional development telecourses. Thank you, Midlands consortium, for giving our students a stepping stone to the future.

Judith A. Ugstad, Language Arts Teacher, Tallassee High School

Issues encountered in the Alabama project which may have general application for distance learning are:

TECHNOLOGY

In many cases, the advanced technology in the equipment supplied to the Alabama sights has had a impact which spanned a continuum from a challenge, to a burden, to an obstacle for the people who have been using it to downlink programming. Teachers are not always the ones who are involved in the use of the equipment; sometimes a student in the class may be called on to activate the equipment and tune in the program, including using the VCR to record. Televisions and VCRs with complicated menu-driven functions, and remote controls with a dozen or more function keys, require far more sophistication and complex technical exposure on the part of the various parties called on (sometimes randomly) to make them work than is necessary for providing high quality reception in the three satellite classes.

SCHEDULING

It is impossible to come up with a schedule for any activity that would comfortably accommodate the class schedules of the schools across Alabama, so it is virtually a given that there will be scheduling difficulties where the satellite classes are concerned. Different beginning and ending times for the school day, different times between classes, lunch schedules, and assemblies are examples of the sorts of occurrences that impinge on the consistency of scheduling around the state. In addition to this aspect of scheduling, there is the fact that some satellite courses are broadcast at times that make them mutually exclusive. There will probably be a major problem coming to a resolution of the fact that different producers will format and broadcast their programming in ways that are the most appropriate to their needs and purposes, but are confusing to the people who are trying to utilize programming from several vendors. Teachers who are participating in the courses as teaching partners will have scheduling problems because of coming from and going to classes that are offered on the normal school schedule while trying to fit into satellite classes that are offered on idiosyncratic schedules. In situations where a teaching partner may be someone from the community or school personnel other than teachers, the same problem with scheduling impacts the students in the classes. Scheduling is a major factor for consideration by any school administration considering distance learning.

ACCREDITATION/CARNEGIE UNITS

An issue in Alabama regarding the Midlands Consortium, and other vendors of programming not offered on a daily basis, is a requirement by the Alabama Department of Education that any class giving full credit must be taught 5 days per week, 55 minutes per day, by a teacher certified to teach the subject. Their contention has been that it would be acceptable to have an appropriately certified teacher in the classroom by satellite, as long as the broadcast fits into the time requirements they hold forth for giving Carnegie Unit credits. There still has not been a satisfactory solution to this problem; rather, the issue has been skirted in ways that have made it possible to offer courses to students who needed them. It would be productive to work with accrediting organizations, such as the Southern Association of Colleges and Schools, to establish meaningful guidelines for distance learning courses which can be applied with enough flexibility to allow students to get the benefit of the programming available without the vendors of that programming being forced to suffer through debilitating efforts to get their formats approved for credit. It is the heartfelt conviction of the Alabama Star Schools staff that the important issue is that of getting quality educational experiences to the students, which quality being the focal concern where credit for the classes is involved. But, it has been seen first hand that havoc can result from attempts to suggest deviation from a focus on quantified standards for determination of course credits, and there is little optimism that a successful resolution can be achieved without intervention from outside the state's educational hierarchy.

THE HUMAN FACTOR

As is the case in so many potentially beneficial proposals and programs, when the actual application is begun the personalities and motives of the people involved lead to many different outcomes. This has been the case with the Alabama portion of the midlands Project. There are those who have taken the foundation of what was given them, and built on that some significant advances, while others have been overwhelmed by trying to cope with the new technology and its applications in the classroom and are just getting by. It would be desirable to develop a screening procedure that would help identify potential teaching partners, but gi·en the reality of the environments in which much of the satellite programming is being applied, prescreening would be a pointless exercise for selection of a teaching partner. Perhaps a rescreening device which assesses attitudes and predispositions for success could be a basis for some training and counseling for new teaching partners. Something like a video/CAI/workbook format might help prepare teachers in areas where lack of knowledge and experience could prove to be a hindrance to the success of the program. The reality of schedules and human nature is such that it would be less likely to be effectively done by satellite, but more likely to be beneficial if provided in a modular form in the formats previously suggested, with those modules forwarded which are indicated by prescreening to be appropriate.

REPORT ON THE ACTIVITIES OF THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT IN KANSAS

PERSONNEL

Dr. Jerry Horn, Kansas State Director, left his position as Associate Dean of the College of Education at Kansas State University in July of 1990 to become the Dean of the College of Education at East Texas State University. Dr. Mel Chastain, Director of the Kansas Regents Educational Communications Center at Kansas State University, was elected by the Midlands Consortium Board to assume the responsibilities of State Director for Kansas for the duration of the project period.

SUMMARY

The project moved to the conclusion phase of operation in a smooth fashion. By the end of the project (through the no-cost extension to December 31, 1990), 79 receive sites in public schools and 10 demonstration receive sites (primarily in Educational Service Centers) were in regular operation throughout the State of Kansas as a direct result of two years of Star Schools participation.

Even though federal funding to the project stopped at the end of the second year, programming which had begun under Star Schools funding continued throughout the entire 1990-91 public school academic year. On-site teaching partner training (for those school districts registered to participate in Spanish via Satellite) was held in three of the Midlands Consortium states (Mississippi, Alabama and Kansas) in mid-August of 1990. By December 31, 1990, 32 hours (16 weeks) of "!Aprendamos!" (Spanish I) satellite instruction had been produced and distributed to 1,550 students in 120 sites in 10 states, or about twice the number of sites and students served during the previous year.

In addition, 32 hours of "!Aprendamos Ma's!" (Spanish II), a new course offering for the 1990-91 school year, had been distributed to an additional 120 students at 30 sites in nine states, and four teacher partner training programs (one each month) had been uplinked to the on-site teaching partners for each of those Spanish I and II sections. The satellite uplinked Spanish programs were augmented by daily lesson plans, text book readings and assignments, audio and video cassette packages, computer programs, tape recorded speaking proficiency examinations, and a wide range of support activities and cultural experiences. Both Spanish I and Spanish II are full year courses, and continued through the end of the academic year (mid-May 1991).

The 1990-91 school year also saw the development and distribution of an ambitious Staff Development series, with six programs (seven hours) of live, interactive programming produced and uplinked prior to December 31, 1990. By May of 1991, the full series of 13 programs (19 hours) had drawn participation from more than 3,000 teachers and administrators in 80 school districts across the country.

LESSONS LEARNED

With our experience of the first year of Star Schools as a standard against which to measure the second year activities, the following comparisons and contrasts have become apparent:

* across the board, students are doing better this year than last year. Test scores are higher, dropout rates from year-long courses are lower, and attitude measurements are more positive. No statistically proven reason for this improvement has been discovered, though common sense points to experience, on the part of the provider, the instructors, the teaching partners, and the students as the primary reason.

* though more successes are achieved with experience, the gains come only with planning--curricular, production, testing, evaluation, etc. The time commitment on the part of the individual instructor to complete this level of planning is often difficult, if not impossible to achieve, since the more capable teachers tend to be fully committed to a wide range of activities.

* if planning, testing and revision is a reliable predictor of success, an equally reliable predictor of failure is "observational television," where a camera is simply placed in the

back of a classroom to record the conventional techniques of the teacher and the interaction between instructor and pupil. Such techniques not only yield ineffective teaching from an achievement standpoint, but produce highly negative attitude scores on the part of the students, faculty and administrators at the receive site.

* a key to the success of the ECC programming efforts, particularly in the Spanish I and II courses, rests with the care for, attention to, and nurturing of the Teaching Partner in each public school receive site. This person is a certified public school teacher, though in most cases is not certified in the subject matter being taught, and must "buy into" the concept of learning the subject along with the students. Not merely a "monitor," the Teaching Partner is a pro-active classroom manager who provides the educational environment at the receive site. Next to an outstanding television teacher and an effective curricular design strategy, the Teaching Partner is the most important ingredient in a successful distance education experience.

* the more nurturing the Teaching Partner receives, the more successful the course. For the 1992 year, the single brochure has become a 30 page manual. If a true spirit of partnership is established between the television teacher and each Teaching Partner, the opportunity for success is enhanced.

* in general, superintendents and principals are not well-informed (though some are extremely enlightened and helpful). A poorly informed administrator (even one who supports the concept of distance education but simply is out of touch with the unique requirements for success) can create inordinate delays and difficulties in every aspect of the process, from assuring quality technical equipment and operation, to the timely routing of weekly lesson plans, processing paperwork, fees, attendance information, test scores and

progress reports. These administrators can reduce an otherwise outstanding receive site to a level of mediocrity.

* It takes nearly a full school year for all "technical support systems" to stabilize: "bugs" worked out of receive equipment, power left on to devices that require energy to "remember" transponder locations, dedicated telephone lines installed in the room in which the equipment and television monitor reside, wireless telephones properly charged, ECC 800 "help" numbers memorized or permanently displayed in the receive room, and expedient mail services established between the receive site and the ECC. Year two yielded far fewer problems, and better performance (and attitudes) among the receive sites.

* even with experience and a growing level of sophistication at the receive sites, mid-year changes in technical delivery (even a change to a different transponder on the same satellite, or a change to a different uplink day of the week) create inordinate problems, cause missed lessons, delays in completing classroom activities on time, stir frustrations at both the origination point and at the receive sites, and require as much as a month to achieve complete recovery. Needless to say, those types of changes are to be avoided at all costs.

* an equally obvious, yet cantankerous problem is the mis-match in starting dates, class times, holidays and concluding dates in public schools throughout the nation. Though most work diligently to adjust their schedules to accommodate the live broadcast sessions, some are required to videotape entire semester or year-long courses, which creates a completely differed (and inferior) learning environment for the Teaching Partner and the students.

* a paradox exists between the very real need for in-depth research into the effectiveness of mediated distance education and the intrusiveness created by most effective data collection

techniques. The greater the detail being sought, the more intrusive the research technique tends to be. Specific research policies need to be developed by each provider of mediated distance education course work, to create a balance between the need to know and the need to learn in an environment free from interruptions and distractions.

* a second paradox exists between the needs expressed by school districts for "quality staff development programs" and the ability of providers to "sell" that very product to the schools. Since "quality" generally carries a higher price than a conventional or mediocre staff development experience, the district will generally select "cheapest" over "best." What they say they want and need, and what they sign up for when it is offered do not often match up.

* if quality staff development is difficult to sell, advanced math is nearly impossible. Despite repeated research publications by OERI and other federally sponsored research organizations that point to the need for such programs, the best and most aggressive marketing strategies for those programs consistently fail to generate enough registrations to enable serious contemplation of such an offering to take place. Any help the DOE, OERI or Star Schools federal directors could provide in solving this dilemma would be greatly appreciated.

CONCLUSIONS

Experience being the best teacher, the ECC has a better sense of where it is going than it had a year ago. Thanks to "Star Schools" funding the first two years, individual programs, and entire year-long courses that would have been impossible to develop and distribute have been made possible, not only for a two year period, but to continue on the strength of their own reputation well into the future. There is no way to appropriately assess the value (financially, academically, socially or politically) of the support received by the ECC, the State of Kansas and the Midlands Consortium as the result of the funding received from the Star Schools project.

The 1991-92 academic season looks bright, with the above-mentioned programs and courses continuing, and new additions dotting the schedule. For 1991-92, a full-year course in French I will be introduced, with French II added the following year. Each of these programs will owe their birthright to the model created by Star Schools funding. In that sense, the Star Schools projects has already accomplished its goals.

REPORT ON THE ACTIVITIES OF THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT IN MISSISSIPPI

The University of Mississippi's Star Schools project has focused on seven components critical to the successful implementation of satellite-delivered courses in secondary schools. These key elements are: installation of satellite-receive equipment, training, subscription and equipment grants, equipment maintenance, local school site support, a distance learning conference, and research and evaluation.

EQUIPMENT INSTALLATION

The University of Mississippi's Office of Distance Learning (ODL) installed TVRO (television receive only) equipment at 80 sites throughout the state during the two years of the project. Each site received a Prodelin 3.7 meter steerable satellite dish capable of receiving both C and Ku-band transmissions, a Chaparral Sierra III satellite receiver, a Zenith 27" digital color television, a Zenith Super VHS video cassette recorder, a Panasonic cordless telephone, and a lockable television/VCR storage cabinet. Security fences were also installed around all of the dishes. Five additional schools secured satellite-receive equipment through the Office of Distance Learning's bid process.

TRAINING

The ODL developed a successful training model for administrators and teaching partners (see Appendix C). This model includes manuals, on-site training, training via satellite, and an annual distance learning conference. The training manuals for both administrators and teaching partners that the ODL produced have been distributed to all of the schools in Mississippi with satellite equipment.

Training was conducted for local school administrators--superintendents, principals, curriculum coordinators, and staff development coordinators--to assist them in selecting courses, teaching partners, and students, and to teach them how to operate the equipment. During year one, training was conducted at the local schools for 123 school administrators in 49 school districts. In the fall of 1990, the ODL's satellite training program for administrators was offered live, via satellite and at no cost to all schools and agencies in the state that were interested in learning more about the effective use of satellite equipment by school and community groups--102 participants registered.

After schools selected their course(s) and the local teaching partner, training was conducted for the local teaching partner on The University of Mississippi campus. During year one, 69 participants attended subject-specific training. The Mississippi Office of Distance Learning staff was assisted by three satellite instructors who introduced the Mississippi teaching partners to the various components of their satellite courses: Joyce Nichols, Oklahoma State University, Basic English and Reading; Harry Wohlert, Oklahoma State University, German; and Chuck Thorpe, Kansas State University, Spanish. During year two, the teaching partner training was conducted on August 21-22, 1990, with 60 participants. Year two training was conducted with assistance from Chuck Thorpe, Spanish satellite instructor, and by experienced Mississippi teaching partners in the other subject areas. Post-training evaluations completed by the participants showed strong positive ratings of the teaching partner training. New teaching partners noted the importance of being able to confer with experienced teaching partners; this informal networking permitted each novice to get questions answered by a more experienced peer.

SUBSCRIPTION GRANTS AND ADDITIONAL EQUIPMENT

The ODL also provided grants that helped defray the cost of course subscription fees to 54 of the state's neediest schools. These grants were awarded using a formula based on school commitment and need. During the first year of the Star Schools grant, the ODL paid $117,460 in subscription grants covering 66.24 percent of the total subscription fees paid by the Midlands Consortium schools. In addition, 50 Apple IIe computers and two voice recognition units were provided to schools that could not afford to purchase the additional equipment needed for their satellite courses. During year two, the microcomputers were reassigned based on changing needs.

LOCAL SCHOOL SITE SUPPORT

Through its toll-free 800 number, the ODL staff also assisted local schools by fielding questions and acting as a clearinghouse for information. A quarterly newsletter, Uplink, was written and distributed by The University of Mississippi's Office of Distance Learning. This newsletter kept administrators, teaching partners, and other interested parties abreast of distance learning conferences, activities, news items, and programming updates.

EQUIPMENT MAINTENANCE

During the two year Star Schools grant period, the ODL also provided equipment maintenance to participating schools. Teaching partners and administrators called a toll-free 800 number and received immediate assistance when their equipment was malfunctioning. Maintenance services included realignment of satellite dishes, fine tuning, satellite programming, and rewiring. The ODL also stored and loaned replacement equipment so that malfunctioning or stolen equipment could be replaced in a timely manner, thus assuring that the reception of student courses would not be interrupted.

RESEARCH AND EVALUATION

The ODL has been an essential part of Midlands' comprehensive research and evaluation effort aimed at measuring student achievement in satellite courses and the attitudes of students, teaching partners, and administrators toward distance learning. Questionnaires were sent to all 750 students enrolled in satellite courses and all teaching partners, principals, and superintendents in the 59 Mississippi high schools participating in Midlands programming during the 1989-90 academic year. This data, which was sent to the University of Kansas for analysis, will provide a comprehensive picture of the effectiveness of satellite-delivered instruction in Mississippi's rural secondary schools.

OTHER OFFICE OF DISTANCE LEARNING INITIATIVES

The University of Mississippi has become a leader in distance education in the state and the region. The staff of the ODL has traveled widely to state, regional, and national meetings to present information about the Mississippi Star Schools Projects and to promote the advancement of distance education.

Grant writing has been another key function of the ODL. These grant proposals have been aimed at meeting the needs of Mississippi students and school personnel through The University of Mississippi's production of student and staff development programming--thus going a step further to ensure the effective and broad-based use of the existing satellite network.

In October 1990, the U.S. Department of Education funded two new projects. SEMPER (Satellite Enhanced Mathematics Project for Enrichment and Remediation) addresses the problem of students' declining interest and performance in mathematics during the adolescent years by improving their access to quality instruction. SEMPER will enrich the seventh through tenth grade general mathematics curriculum by offering both student supplementary programming and teacher staff development programs via satellite.

Health Star, a satellite-delivered health education program also funded by the U.S. Department of Education, is targeted for students in the fifth and sixth grades. This programming will cover the areas of personal health, fitness, nutrition, prevention of chronic diseases, and accident prevention and safety and will be correlated with the objectives of the Mississippi Comprehensive School Health Curriculum. This grant contains staff development, student enrichment, and parent involvement components.

Funds are also being sought from private foundations and industries to permit The University of Mississippi to continue to meet the goals of all Star Schools in Mississippi. These grants focus on training, research and evaluation of distance learning, and technical assistance to all 161 Star Schools in Mississippi.

These grants will enable The University of Mississippi to continue to produce quality programming. To this end, the University purchased a mobile Ku-band uplink and equipment to enhance the University Teleproductions Resource Center. This equipment enabled the ODL to produce two live, interactive staff development programs. The first, "The Liability of Principals for School Accidents," was targeted for local school administrators and had 104 registrants. The second production, "Mississippi

Distance Learning Update: A Teleconference for Administrators and Teachers" was described earlier in the training section. These productions were offered at no cost to schools in all three of the state's Star Schools consortia.

Other evidence of The University's commitment to distance education is its provision for teleconference receive sites on the campus. Classrooms in the School of Education have been renovated and now serve as a teleconference receive site. Equipment has also been added to the auditorium in the Center for Public Service and Continuing Studies, providing an additional teleconference center on the University campus that will accommodate an audience of up to 160 people.

REPORT ON THE ACTIVITIES OF THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT IN MISSOURI

The Education Satellite Network, established by the Missouri School Boards Association, a not-for-profit organization serving the needs of local school board members, has become recognized as one of the leading providers of satellite-delivered, educational programming in the United States.

Much of the network's initial growth can be directly attributed to the availability of funding through the federal government's Star Schools program. In 1988 the Missouri School Boards Association, as part of the Midlands Consortium, received a $1 million grant from the Star Schools program. This grant enabled ESN to develop a modern studio and video production facility. It also allowed the network to acquire a mobile C-band uplink truck and a mobile production van, thus giving ESN the means to produce and transmit programming from virtually any location in the United States. Second year funding provided an additional $750,000 to complete the production facilities as well as to allow ESN to continue to produce educational teleconferences.

PROGRAMMING SUMMARY

Education Satellite Network

The Education Satellite Network has produced several programs over the past two years for schools in Missouri and nationwide. Several of these programs were funded through the Star Schools project. Additional programs were funded by local school district membership fees and underwriting grants. Program topics included: students at risk, special education, parents as teachers, mastery learning, economics for elementary students, site coordinator training, Missouri government, and career development. A complete listing of Star Schools projects can be found in Appendix E.

Missouri School Boards Association

The Missouri School Boards Association, developed programs and teleconferences for school board members, administrators and educators on a variety of topics. Leadership training, risk management, board candidate training, legislative workshops, and a monthly video-news magazine were produced and uplinked to schools across the state. A complete listing of MSBA programs and additional ESN programs can be found in Appendix F.

Other

MSBA/ESN provided support to additional education organizations in developing and distributing video programs and teleconferences to a wide and varied audience, including the Missouri Department of Elementary and Secondary Education, National School Boards Association, Missouri State Teacher Association, University of Missouri-Columbia, and Central Missouri State University. These organizations developed educational programs which were distributed to schools across the state of Missouri. Several commercial organizations also contracted with MSBA/ESN; the proceeds from services rendered helped support the on-going goals of the Education Satellite Network, and allowed ESN to further expand the programs available to schools, educators and students.

PRODUCTION/ENGINEERING

Facilities

With a complete production and teleconferencing center in place, MSBA/ESN is continually producing video programs and teleconferences for use in educational institutions across the country. ESN now has a studio and editing facilities in Columbia, and editing facilities in Jefferson City, at the Missouri Department of Elementary and Secondary Education studio, as well as a mobile production van. A mobile C-band uplink truck allows ESN to travel to virtually any site in the country and uplink teleconferences. A list of production and engineering equipment and facilities capabilities can be found in Appendix G.

RECEIVE SITES

Today there are more than 400 ESN downlink sites in Missouri and 40 sites in nine other states, including Alabama, Arizona, Colorado, Idaho, Kansas, Mississippi, Montana, New Hampshire, Tennessee, Texas, and Wyoming. The interest by schools across the country is expanding daily, and

ESN anticipates substantial growth in participation over the next few years. A list of schools participating in ESN can be found in Appendix H.

Non-member schools can participate in individual programs by paying a nominal site fee, allowing schools to pick and choose those programs which meet their specific needs.

ADDITIONAL FUNDING SUMMARY

SB709

The Missouri School Boards Association was instrumental in lobbying the Missouri General Assembly to lift a long standing sales tax exemption on the rental of videotapes. Money now collected under this sales tax is earmarked for school districts that want to acquire the equipment and programming necessary to offer satellite learning opportunities. Today Missouri school districts need only apply to receive funding necessary to begin or expand distance learning programs.

NTIA

MSBA/ESN was awarded a $319,050 grant from the National Telecommunications and Information Administration in September, 1987. This grant was designed to provide downlink equipment and ESN programming at a reduced fee to schools in areas of Missouri not currently served by PBS or cable. Currently 10 schools are participating in this program.

Underwriting

MSBA/ESN actively seeks underwriting grants from businesses and industries, organizations, foundations and grants to assist with the development and production of high-quality educational programs. By supporting these programs, the financial burden is removed from the school district, allowing much greater participation.

SUMMARY

Although Star Schools funding for ESN has run its course, the network continues to grow and define its niche in the education marketplace. In the beginning, ESN served largely as a broker of existing programming whether that programming was instructional, classroom enrichment or teleconferences. However, today ESN is producing a much wider array of original programming. Some of that programming includes school board training activities, teacher inservice, staff development training, and student enrichment programming.

REPORT ON THE ACTIVITIES OF THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT IN OKLAHOMA

(For more detailed information, please consult the quarterly reports and other reports routinely submitted to Midlands Consortium Management Unit throughout the grant period).

BASIC ENGLISH AND READING (GRADES 7 AND 8)

The U.S. Department of Education's Star Schools grant made it possible for Oklahoma State University's Arts and Sciences Teleconferencing Service (ASTS) to develop a new course aimed at grades 7 and 8 and intended specifically for students who had already experienced reading and language difficulties and failure in the regular school curriculum. In its first year (1989-90), ""Basic English and Reading" served 405 students in 29 schools in seven states. According to information obtained by the course instructor during 1989-90, approximately 10% of the students served were Native American and approximately 42% were African-American. Chapter I students, including Caucasian and minority students, comprised approximately 22% of the course enrollment.

In its second year (1990-91), the course served 955 students in 64 schools in 11 states (Alaska, Alabama, Arizona, Arkansas, Colorado, Missouri, Mississippi, Oklahoma, Vermont, Wisconsin, and West Virginia). This represents a 58% increase in the number of students and a 55% increase in the number of schools served from Year 1 to Year 2.

Enrollment is under way for the 1991-92 school year.

Evaluations from students and from local teachers (teaching partners) participating in "Basic English and Reading" have been extremely favorable and have been the basis for annual revisions of the course by Dr. Joyce Nichols, the instructor. A more comprehensive evaluation of the satellite courses offered by members of the Midlands Consortium, which included the "Basic English and Reading" course and which also included courses not directly funded by the Star Schools grant, was conducted by Dr. John Poggio of the University of Kansas, and those findings are included elsewhere in the Midlands Consortium final project report.

Just recently, Dr. Nichols was notified that she has been awarded a two-year, U.S. Department of Education grant (October 1, 1991-September 30, 1993) to develop a companion course for grades 5 and 6.

RUSSIAN I

In its first year (1989-90), the Russian course, which was developed with Star Schools funding, served 176 students in 21 schools in six states. In its second year (1990-91), the course served 170 students in 28 schools in 13 states (Alaska, Alabama, Arizona, Georgia, Kansas, Massachusetts, Maine, Mississippi, Oklahoma, Pennsylvania, Tennessee, Vermont, and West Virginia).

Student and teaching partner evaluations of the Russian course have been generally favorable and have formed the basis for ongoing revision in course content, format, and management. The Russian course was included in the comprehensive research/evaluation project conducted by the University of Kansas; the results of that effort are included elsewhere in the Midlands Consortium final project report.

Enrollment is under way for the 1991-92 school year for both Russian I and Russian II, which was developed during 1990-91 with a grant from the Oklahoma Department of Education.

OTHER ASTS COURSES/PROGRAMS

Enrollments in other courses produced by the Arts and Sciences Teleconferencing Service (ASTS) for the 1990-91 school year were as follows (note: Applied Economics and AP American Government are one-semester courses; all other courses are year-long):

Course	Number of Schools	Number of Students
German I	217	1,800
German II	79	320
AP Physics	126	900
AP Chemistry	29	185
AP Calculus	63	360
Trig/Analytic Geometry	6	50

Applied Economics	42	630
AP American Government	38	320

In summary, ASTS credit courses in 1990-91 enrolled more than 5,600 students in 478 different schools in 30 states: Alaska, Alabama, Arizona, Arkansas, California, Colorado, Georgia, Idaho, Illinois, Indiana, Kansas, Louisiana, Massachusetts, Maine, Michigan, Missouri, Mississippi, Montana, North Dakota, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Virginia, Vermont, Washington, Wisconsin, and West Virginia.

In addition, 25, 000 students at 358 schools in a total of 42 different states participated in a non-credit Pre-College Guidance Series offered by the OSU College of Arts and Sciences in cooperation with The College Board.

EQUIPMENT GRANTS TO SCHOOLS

As part of the Oklahoma Star Schools Project, all schools in Oklahoma were invited to apply for an equipment grant that would fund the installation of a downlink, a television, a video cassette recorder, and a telephone at a designated school site. A committee which included representatives of the Oklahoma State Department of Education and school administrators reviewed the proposals submitted by school districts and selected 35 schools to receive awards. Attached is a profile of each of the 35 schools in Oklahoma which received Star Schools equipment grants. (See Appendix I.)

APPENDIX A

Oklahoma State University's Staff Development Program Registration Summary

MIDLANDS CONSORTIUM STAR SCHOOLS
STAFF DEVELOPMENT PROGRAM REGISTRATION SUMMARY

COURSE	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF STATES
AIDS/STD Teacher Resources	10	73+	*
COMETS	13	30+	*
Definition & Eligibility Criteria for Special Education	108	2219	*
Designing K-8 Learning Environments	91	1820	34
Distance Education	98	*	34
Fearless Math	7	32+	*
It's a New World	3	*	*
Learning Strategies for LD	26	*	*
Moving Out & Moving On	26	390+	*
Parents as Teachers		358	*
Pre-School Assessment	5	8+	*
Reading & Writing Relationships	18	*	*
Students at Risk	20	100 (est.)	2+
Students at Risk: A National Perspective	35	155	2+

MIDLANDS CONSORTIUM STAR SCHOOLS
STAFF DEVELOPMENT PROGRAM REGISTRATION SUMMARY

COURSE	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF STATES
Contemporary Issues for Teachers Working with the Educationally Disadvantaged: Children at Risk-Definitions, Needs, & Solutions	47	129	5
Technology Update for Educators: Optical, Computer, Network & Media	*	*	*
Microcomputers & Science Education	*	*	*
Improving Teaching at a Distance	33	660	22
Whole Language: What Makes It Whole?	*	*	*
Technology Update for Educators: Multimedia systems, Satellite Communications, & Planning for the Future	41	820	21
TOTAL	581	6161	116

* Enrollment numbers are unknown, because formal registration was not required.

APPENDIX B

Inventory of Star Schools Equipment

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Satellite Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Satellite Equipment				1							$332.03	$332.03
12 ft Satellite Dish	Prodelin	2									$3,579.54	$7,159.08
Antennas						2					$1,736.00	$3,472.00
Satellite Receiver	Sierra III/Chaparral	2						4		3	$809.76	$7,287.84
Complete Satellite Systems								1			$18,484.98	$18,484.98
Satellite Receiver										1	$6,500.00	$6,500.00
Satellite Dish			0.5	0.5							$3,183.65	$3,183.65
Satellite TV System	TVRO*							75		11	$4,564.30	$392,529.80
Uplink Dish	Encom	1									$251,039.44	$251,039.44
Uplink Dish Foundation		1									$12,494.96	$12,494.96
Satellite Systems	TVRO*	25						6		60	$3,080.83	$280,355.53
Satellite Dish	Encom	1									$158,579.42	$158,579.42
Satellite	TVRO3*	52									$4,389.30	$223,043.60
Decoder	Option 9B	2									$295.00	$590.00
Satellite	TVRO	45									$4,430.65	$199,379.25
Satellite	TVRO*					30					$4,264.30	$127,929.00
Satellite System	TVRO*							8			$4,097.63	$32,781.04
Satellite System	TVRO*					5					$3,903.55	$19,517.75
Satellite System	TVRO*						1				$3,133.00	$3,133.00
Receiver	Chaparral									2	$853.00	$1,706.00
LNB (c)	11280501							5			$88.00	$440.00
LNB (Ku)	11371206	2				2		5			$152.90	$1,376.10
Co Rotor	Chaparral	28				2					$116.60	$3,498.00
C-Band	Chaparral	28				2					$88.00	$2,640.00
Satellite Storage					1						$5,343.33	$5,343.33
	Unit Totals	189	0.5	1.5	1	43	1	104	0	77		$1,762,795.80
						TOTAL SATELLITE EQUIPMENT						**$1,762,795.80**

KS=Kansas State University, KU=University of Kansas, REC=Kansas Regents Education Communications Center

MU=Oklahoma State University's Management Unit, OKAS=OSU's Arts & Sciences Office, OKETS=OSU's Education Television Services

MS=Mississippi State University, MO=Missouri School Boards Association, UAB=University of Alabama at Birmingham

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Computer Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
8" Color Monitor	Videotek VM8PRD								2		$962.50	$1,925.00
8" Monitor	Videotek 8PRD								2		$960.00	$1,920.00
8" Monitor	Videotek VM8-PRW								1		$1,240.00	$1,240.00
9" B/W Monitors	PM95A						12				$395.00	$4,740.00
8" Monitor dual	Videotek VM8-PRD								1		$1,920.00	$1,920.00
9" Dual Color Monitor	Sony		1								$976.11	$976.11
9" B/W Monitors	PM95A						10				$390.00	$3,900.00
13" Color Monitor	VM-13 Pro								2		$1,695.00	$3,390.00
12" Monochrome Display	8503-001							2			$164.00	$328.00
13" Color Monitor	Videotek VM 13								2		$1,375.00	$2,750.00
13" Monitor	Sony PVM1272Q								1		$950.00	$950.00
14" Color Display Monitor	8512-001							1			$378.00	$378.00
14" Color Monitor	Ikegami TM14-16R							1			$3,000.00	$3,000.00
B/W Monitors	TR-930							6			$164.50	$987.00
Color Monitor	CPD1302									1	$707.00	$707.00
Color Monitor	PVM1910									1	$642.00	$642.00
Color Monitor	Sony 8P30	2	2								$474.43	$948.86
Color Monitor	CGA					1					$217.00	$217.00
Color Field Monitor	Sony 8"PVM8020								1		$545.00	$545.00
Color Monitor	Sony PVM 2030								2		$880.00	$1,760.00
Color Monitor	Samtron								1		$139.00	$139.00
Color Video Monitor	VideoTech Pro13								1		$1,375.00	$1,375.00
Monitor	VM 13 PRO								1		$1,380.00	$1,380.00
Monitor & Speakers	Videotek VM8-PRA								1		$1,180.00	$1,180.00
Monitor/Receiver	Sony		1								$3,487.41	$3,487.41
Monitoring Equipment	Mitsubishi CS3520									2	$2,009.00	$4,018.00
Monochrome Monitor	IBM					1					$150.00	$150.00
Monochrome Monitor	IBM PS/2					2					$165.00	$330.00
Monochrome Monitor	8503-001							2			$164.00	$328.00
Monitor	Panasonic WV-5203B		1								$681.85	$681.85
Monitor	Panasonic yl 00819, 20, 21								1		$995.00	$995.00
												$47,288.23

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MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Computer Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Portable Monitor	Sony BMV 8021								1		$1,055.00	$1,055.00
RBG Monitor	Model 1464					2					$246.17	$492.34
High Resolution Monitor	Apple RBG							1			$709.79	$709.79
Portable Zenith Computer	Cambridge A-50		1								$811.95	$811.95
Portable SP U-Matic Color	Sony		1								$3,945.49	$3,945.49
Personal Computer	Apple A2P6015/A									15	$1,576.30	$23,644.50
Computer Macintosh	Apple IIE							1			$943.45	$943.45
Computer Macintosh	Apple IIE							66			$820.12	$54,127.92
Computer Macintosh	Apple !!GS									20	$1,309.35	$26,187.00
Computer Macintosh	Apple II									1	$4,534.01	$4,534.01
Computer Macintosh	Apple IIsi							1			$2,972.94	$2,972.94
Computer Macintosh	Mac SE 30									2	$3,304.13	$6,608.26
Computer Macintosh	Mac SE 30									1	$4,256.63	$4,256.63
Computer Macintosh	Mas SE 30				1						$2,963.89	$2,963.89
Computer Macintosh	Mac Plus									20	$1,318.74	$26,374.80
Computer Macintosh	Mac Plus									24	$1,131.73	$27,161.52
Computer Macintosh	Mac SE									15	$2,086.33	$31,294.95
Computer Macintosh	Mac SE									2	$4,266.05	$8,532.10
Computer Macintosh	Mac SE									25	$1,834.11	$45,852.75
Computer Macintosh	Mac SE									2	$2,337.55	$4,675.10
Computer Macintosh	Mac SE	1									$1,951.13	$1,951.13
Computer Macintosh	Mac SE					1					$2,446.15	$2,446.15
Computer Macintosh	Mac SE	1									$3,689.96	$3,689.96
Computer Macintosh	Macintosh									1	$1,990.42	$1,990.42
Computer	IBM PS/2								1	4	$1,048.00	$5,240.00
Computer	IBM PS/2					1					$4,797.00	$4,797.00
Computer	IBM PS/2					2					$2,337.00	$4,674.00
Computer	IBM PS/2							3			$1,376.00	$4,128.00
Computer	IBM PS/2							1			$1,649.00	$1,649.00
Computer	II GS									12	$1 304.28	$15,651.36
Computer			1								$664.05	$664.05
												$324,025.46

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Computer Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Computer										2	$982.50	$1,965.00
Computer	QA-50									1	$1,495.00	$1,495.00
Computer	Zenith Model 20							1			$1,804.26	$1,804.26
Graphics Computer	ComuAdd 386/16								1		$4,777.00	$4,777.00
Graphics Computer	Generation Image								1		$1,443.00	$1,443.00
XT 10 meg. System						1					$429.00	$429.00
2MB Expanded Memory	FC-3905							1			$948.00	$948.00
Disk Drive 3.5	Apple IIGS					1					$304.80	$304.80
Macintosh IIXC Hard Disk	Macintosh		1								$4,241.00	$4,241.00
Disk Hard Drive										1	$1,278.19	$1,278.19
Disk Hard Drive	M1604									40	$638.74	$25,549.60
External 40 Meg Hard Disk	Tallgrass/Macintosh		1								$629.96	$629.96
External 40 Meg Hard Disk	Nova		1	1							$644.24	$1,288.48
External 40 Meg Hard Disk	Nova			1							$672.50	$672.50
Imagewriter II	Mac SE					1					$423.26	$423.26
Internal Hard Drive	Zenith 158 40 meg			1							$380.45	$380.45
Apple II 512K	RGB					1					$1,653.44	$1,653.44
Apple II 512K	RGB					1					$1,409.84	$1,409.84
Disk Drive 5.25						3		1			$233.75	$935.00
Floppy Disk Drive	5.25 360K					3					$69.00	$207.00
Hard Drive Controller						1					$105.00	$105.00
Anchor Modem	2400E							2			$165.00	$330.00
Apple Keyboard Extended	Macintosh		160								$160.30	$25,648.00
Keyboard	Apple							1			$162.70	$162.70
Laserwriter Envelope Casette	Apple		1								$63.23	$63.23
Modem	V32									4	$822.00	$3,288.00
Personal System/2-IBM	30							3			$1,376.00	$4,128.00
Printer Dotmatrix	DMSAT	2									$302.00	$604.00
Printer	DMSAT	5									$309.00	$1,545.00
Printer	Panasonic	1									$255.00	$255.00
												$87,963.71

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Computer Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Printer	Hewlett Packard								1		$865.22	$865.22
Printer	Hewlett Packard							1			$1,815.00	$1,815.00
Printer	Hewlett Packard									1	$1,714.02	$1,714.02
Printer	Hewlett Packard									1	$1,377.35	$1,377.35
Printer	Laserwriter II									1	$3,033.84	$3,033.84
Laserwriter IIntx	Macintosh		1								$4,360.00	$4,360.00
Printer Imagewriter	A9M0320									2	$703.00	$1,406.00
Printer Imagewriter	II									8	$1,031.24	$8,249.92
Printer Imagewriter	II							1			$493.80	$493.80
Printer Imagewriter	II									1	$1,178.42	$1,178.42
Printer Imagewriter	Image II									1	$884.00	$884.00
Printer Imagewriter	LQ									1	$971.36	$971.36
Printer Imagewriter	Laser II									1	$3,172.22	$3,172.22
Printer	NECC P2220					1					$315.00	$315.00
Printer	Laserwriter II					1					$2,992.06	$2,992.06
Printer	Laserjet							1			$2,340.00	$2,340.00
Printer	Laserwriter IINT							1			$3,104.89	$3,104.89
Quietwriter III Printer	IBM							2			$1,154.00	$2,308.00
Printer	Epson 1050							1			$444.00	$444.00
Digital Scan Converter	Yamashita CVS900					1					$10,802.73	$10,802.73
Ace 10 Edit	Ampex	1									$5,797.00	$5,797.00
Appleshare Fileserver				1							$2,023.39	$2,023.39
Foxbase+/Mac 2.0	Macintosh Software			1							$255.00	$255.00
Computer Software										1	$5,996.25	$5,996.25
Edit Listen Software									1		$823.00	$823.00
Computer Program	Aldus Pagemaker		1								$402.00	$402.00
Mouse/Manual/Software	Logitech Series/2								5		$57.00	$285.00
Promodel 3D Software	4.0 AT&T								1		$3,333.00	$3,333.00
Software 4.0	Tips Imaging True								1		$955.00	$955.00
Software 4.0	IBM DOS 4.0								4		$85.00	$340.00
Software Ver. 1.2	Inscriber Image N.								1		$1,895.00	$1,895.00
												$73,932.47

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MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Computer Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Special Effects Software	Maurice Sys.								1		$0.00	$0.00
Standard Laserjet Paint	110V							1			$2,340.30	$2,340.34
Local Talk Kit						1					$35.53	$35.53
Appleworks GS						1					$201.99	$201.99
Apple II GS Upgrade						3					$112.97	$338.91
Apple II GS Upgrade						3					$49.02	$147.06
Claris Appleworks						1					$171.54	$171.54
Computer Software						1					$119.00	$119.00
Alf Quick Copy Diskette	Model 801					1					$1,995.00	$1,995.00
2 M Memory Modules						2					$837.00	$1,674.00
2 MB Expanded Memory Adaptor	FC-3905							1			$948.00	$948.00
	Unit Totals	13	174	5	1	38	22	103	38	214		$7,971.37
						TOTAL COMPUTER EQUIPMENT						$541,181.24

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Batteries/Adaptors	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Cables/Actuators												
10 m Cable	Sony CC2-10		3								$365.65	$1,096.95
10 m Cable	Sony CC2-A10		2								$309.75	$619.50
200' Cable	RG6U	1									$67.20	$67.20
Flex Cable	Sony LO-26		1								$745.20	$745.20
82 ' Camera Cable	Sony CCQ 25 AM								1		$170.00	$170.00
995' Cable	P/N 11412 SHE								1		$69.26	$69.26
PSC Cable Cloth Pigtail	SPSC 1091		2								$25.00	$50.00
PSC 48 PH-T-PWR Barrel	SPSC 1088		2								$48.00	$96.00
PSC Phase Bar	SPSC 0040		2								$25.00	$50.00
Adaptor	Sony CAC-21		2								$52.00	$104.00
Adaptor	Sony LO-612		2								$99.00	$198.00
Extension Connector	Sony CC22-1E		2								$56.99	$113.98
Feature Code Network Adaptor						2					$450.00	$900.00
AC Adapter	Sony CMA 8								2		$378.00	$756.00
AC Adaptors	Sony CMA 8								4		$395.00	$1,580.00
AC-DC Color Special	Sony SEG		1								$4,399.16	$4,399.16
Actuator	Saginaw					2		5			$115.50	$808.50
Adaptor/Monitor/Bracket	Sony		1								$822.86	$822.86
Battery Belt	Anton Bauer 30/13								1		$1,269.00	$1,269.00
Battery Charger	Sony BC 1WA								1		$250.00	$250.00
Cable	Sony CCZQA10								2		$244.57	$489.14
Cable	Sony CCZQA5								3		$190.22	$570.66
Cable Adaptors	Connectors for 300								2		$62.00	$124.00
Camera AC Adaptor	Sony CMA 8								1		$360.00	$360.00
DC Cable	Sony CCDQ-06								3		$21.70	$65.10
CR-2 Cable Holder									1		$16.00	$16.00
Camera Cable	Sony CCZA100								1		$1,740.66	$1,740.66
Carrying Case for AC/DC	Sony		1								$274.09	$274.09
Connector Gender	Charger, Model PO38								11		$31.50	$346.50
RTS Belt Pack	317								1		$145.00	$145.00
RTS Power Supply	PS8								2		$353.00	$706.00
												$19,002.76

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Batteries/Adaptors	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Cables/Actuators												
Portable Fiber Optics Case		1									$1,014.00	$1,014.00
Portable Fiber Optics Transm.	GVG	1									$1,337.00	$1,337.00
Interface	TLX	1									$491.14	$491.14
Interface	Symetrix	1									$721.50	$721.50
Receiver	DATASAT	2									$366.00	$732.00
Interface Transmit Receiver		2									$529.00	$1,058.00
Interface	DATASAT	5									$359.00	$1,795.00
	Unit Totals	14	21	0	0	4	0	5	37	0		$7,148.64
						TOTAL BATTERY EQUIPMENT						$26,151.40

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MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Amp Unit							150				$4.50	$675.00
Balance Mettler	BB244									1	$1,012.50	$1,012.50
Balance Mettler										5	$950.00	$4,750.00
Balance Electronic										1	$694.95	$694.95
Board Emulation										2	$805.00	$1,610.00
BTS/Sony Studio Beta	BCB-60N/RMM-100								1		$21,247.00	$21,247.00
Camcorder	AG-170									3	$1,191.00	$3,573.00
Camcorder	AG-450									1	$1,603.00	$1,603.00
Camcorder Panasonic	S-VHS									1	$1,735.00	$1,735.00
Camera Equipment			1								$930.00	$930.00
Camera 7	Sony DXCM7K								1		$10,665.95	$10,665.95
Camera Control	Sony CCUM3								1		$742.50	$742.50
Camera Control Unit	Sony CCU-M7		2								$2,497.25	$4,994.50
Camera Control Unit	Sony CCUM3								2		$969.00	$1,938.00
Camera Control Units	CCUM3		3								$504.89	$1,514.67
Camera Color Automatic	HK-323BT-18-MS						2				$56,720.00	$113,440.00
Camera Extender	HK323-L-1-1						2				$22,000.00	$44,000.00
CCD Color Video Camera Head	Sony DXC-M7		2								$9,115.50	$18,231.00
Camera Head & Adaptor	Sony		1								$4,981.48	$4,981.48
Camera Controls	Sony CCUM3								4		$1,195.00	$4,780.00
Camera Equipment	Midwest C		1								$951.00	$951.00
Camera Head	Sony DXC-M7/M7K								2		$8,536.50	$17,073.00
Camera Head & Adaptor	Sony		1								$4,981.48	$4,981.48
Camera Promptor	Cinema Prod. 5P001								1		$3,135.00	$3,135.00
Camera Overhead	Ikegami						1				$18,403.00	$18,403.00
CCU Monitor	Sony DXF40		1						3		$485.00	$1,940.00
CCV-Camera	Sony		1								$1,137.40	$1,137.40
Character Generator	Quanta QCG-400								1		$5,000.00	$5,000.00
Color Body Video Camera	Sony		1								$4,101.80	$4,101.80
Color Pramp for Color Camera	Sony		1								$258.00	$258.00
Controller Dubbing	AG-A100									1	$624.00	$624.00
												$300,723.23

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MJ	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Control Panel	V-Matic		1								$2,572.15	$2,572.15
Curtain Track/Access									1		$2,405.00	$2,405.00
Custom Console									1		$1,812.00	$1,812.00
Device Plate: Liquid										1	$574.00	$574.00
Digital Character Generator	A72						1				$43,319.52	$43,319.52
Digital Still Store	A42						1				$21,869.22	$21,869.22
Digital Fr. Synenizer	A53D						1				$54,811.26	$54,811.26
Digital Sync Generator	Videotek VSG-20		1								$1,555.00	$1,555.00
Digital Time Base Corrector	FORA FA-300		1								$6,074.96	$6,074.96
Disk Player Compact	M2850									24	$937.10	$22,490.40
DPS Time Base	Corrector								1		$2,680.00	$2,680.00
Dubbing Controller	A6A100								1		$672.00	$672.00
Dual Rack	Ikegami PMOP10						6				$66.00	$396.00
Dubbing Rack										2	$1,286.00	$2,572.00
Editing System S-VHS								1			$9,363.00	$9,363.00
Edit Controller	Sony BM450								1		$1,795.00	$1,795.00
Edit Controller	Sony BVE900								1		$9,100.00	$9,100.00
Edit Controller	Sony BVE900									1	$6,848.00	$6,848.00
Editing System Group A	Beta						1				$61,600.00	$61,600.00
Editing System	CEL P158								1		$19,740.00	$19,740.00
Editor, Recorder	Sony							1			$6,590.00	$6,590.00
Effects Projector	Lektolite 7								1		$410.50	$410.50
Elec. Sketch Pad/Cable	Summ Sketch Plus								1		$565.00	$565.00
Elect. View Finder	Sony DFX50								1	2	$790.00	$2,370.00
Encoder										1	$746.50	$746.50
Flex Waveguide									1		$515.00	$515.00
Frame	Videotek DT-1								1		$59.75	$59.75
Generator Encoder	Sync Lenco 843								1		$1,400.00	$1,400.00
Generator	Sony 2550A									1	$9,653.00	$9,653.00
Graphics Board	Targa 16								1		$1,725.00	$1,725.00
Grass Valley Delay DA	8504						26				$430.00	$11,180.00
												$307,464.26

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
HME Rack	DR6125-19-24								6		$341.12	$2,046.72
Hum Bucker	ACD								2		$115.00	$230.00
Interface	BKE-915									2	$1,098.00	$2,196.00
Interface	IF-500									4	$979.00	$3,916.00
Interface	SI 5320									1	$529.00	$529.00
Interface Card	ARCNET PC 120								5		$135.00	$675.00
Interface Card	ARCNET PS110								1		$450.00	$450.00
ITE Dolly									1		$455.00	$455.00
ITE Fluid Head	10RH50E								1		$775.00	$775.00
ITE Tripod									1		$680.00	$680.00
JBL Control 1									1		$180.00	$180.00
JBL Control 1 Speaker	Loudspeaker								2		$700.00	$1,400.00
JBL Speaker Mount	M+C+2								1		$33.00	$33.00
Laser Disc Player	4200									25	$917.00	$22,925.00
Lens	Canon J15X9.5								1		$1,900.00	$1,900.00
Light Kit	Comp EFP3/3LCS								2		$1,040.00	$2,080.00
Logitek BV Supply	Power Supply								1		$35.00	$35.00
Logitek BVS VU	Display & Rack								1		$290.33	$290.33
Logitek Power Amp	Power 30								1		$415.00	$415.00
MCL HP Amplifier		1									$31,250.00	$31,250.00
Microphone	Electra Voice								2		$147.00	$294.00
Microphone	Sony ECM 672								2		$335.00	$670.00
Microphone System	Wireless HM Elec. 50								2		$823.00	$1,646.00
Microphones	Sony Lavalier ECM								6		$140.00	$840.00
Microphone	Prof. Lavalier		2								$215.00	$430.00
Mixer Interface	V32								1		$0.00	$0.00
Monitor Receiver	Sony		1								$3,487.41	$3,487.41
MSS Module									1		$1,072.00	$1,072.00
MISC & RGB Compatible	Kodak		1								$3,599.00	$3,599.00
Monochrome HiResolution Elec.	Sony DXF50		1								$509.85	$509.85
NTSC Waveform Monitor Vector	Videotek TSM-60		1								$3,380.00	$3,380.00
												$88,389.31

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Passive Hub	Standard								1		$60.00	$60.00
Portable 5MPTE Time Code	Sony		1								$673.53	$673.53
Portable CD Player	Sony D160								2		$300.00	$600.00
Power Amplifier	Logitek RM PWER30								1		$415.00	$415.00
Power Meter	Geneva Microwave								1		$524.00	$524.00
Presswave Regulator									1		$145.00	$145.00
Prime Image TBC 250									1		$3,505.00	$3,505.00
Prime Image Time	Corrector #160								1		$4,382.00	$4,382.00
Production/Video Equipment			1								$260.00	$260.00
Projection Device	N View II									1	$1,290.00	$1,290.00
Projection Screen Daylite										1	$750.00	$750.00
Projection System										1	$11,033.00	$11,033.00
QSI Bay Generator	2440								1		$2,820.00	$2,820.00
Rear Focus Control	Sony LO 1309								3		$1,340.00	$4,020.00
Recorder & Bag	BTS Sony								1		$13,080.00	$13,080.00
Recorder Video	AG-1830									2	$1,250.00	$2,500.00
Recorder Video	HS-U70									6	$805.00	$4,830.00
Recorder Video Cassette	AG-1960									1	$1,175.00	$1,175.00
Recorder Video Cassette	AG-1960									1	$1,188.78	$1,188.78
Recorder Video Cassette	AG-6810									12	$1,480.00	$17,760.00
Recorder Video Cassette	VRE 550HF									10	$732.00	$7,320.00
Recorder Video Tape										2	$1,098.00	$2,196.00
Recorder/Player	Sony							1			$4,324.00	$4,324.00
RTS Central Control	4010								2		$1,452.00	$2,904.00
RTS IFB Control									1		$456.00	$456.00
RTS Intercoms									4		$266.00	$1,064.00
RTS Station	RM300								1		$295.00	$295.00
Scope	Wavform/vectr								1		$3,465.00	$3,465.00
Slow Motion Format Corrector	Microtime							1			$5,500.00	$5,500.00
Sony 4" Viewfinder									1		$473.00	$473.00
Sony E-File	Interface Card								1		$460.00	$460.00
												$99,468.31

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Sony MVR-5600 (2)			2								$5,790.00	$11,580.00
Sony Recorder/Player	9850								1		$6,758.00	$6,758.00
Sony RME-5500			1								$851.00	$851.00
Sony RMM-57K			1								$345.00	$345.00
Special Effects Generator	Sony SEG 2000A								1		$4,600.00	$4,600.00
Special Effects/Router	CEL P169V								1		$23,420.00	$23,420.00
Studio Production Equipment							1				$119,931.00	$119,931.00
Studio Viewfinder	Sony DXF 50								1		$790.00	$790.00
Switcher	Grass Valley Ten SL								1		$370.00	$370.00
Switcher	Grass Valley Ten XL								1		$247.00	$247.00
Sync Board for Camera	Sony		1								$465.00	$465.00
Sync Test Generator	Videotek VSG201								2		$1,620.00	$3,240.00
Teleconference Iris Control			3								$563.46	$1,690.38
Teleprompter w/Monitor	D175ARUH	1									$1,404.86	$1,404.86
Time Code Generator/Reader	Sony							1			$956.00	$956.00
Time Code Reader	Sony							1			$720.00	$720.00
Timecode U-Based Editing			1								$10,633.00	$10,633.00
Topas Pro Modeler	AT 7 T								1		$3,300.00	$3,300.00
Travelite Displays									1		$6,867.51	$6,867.51
TBC/Frame SYNC	I.DenIVT							1			$2,417.00	$2,417.00
Tripod /Fluid Head	ITE T-12/ITE g-50								2		$1,280.00	$2,560.00
TRS Station	RM 300								1		$295.00	$295.00
TV	Sanyo 26 DS26950				2						$399.87	$799.74
TV Monitor	Zenith SF2795W	25									$622.00	$15,550.00
TV Monitor	Zenith SE 2791	110			1	67		70		10	$549.00	$141,642.00
TV/VCR	RTRC70E	8									$580.00	$4,640.00
Umatic SP Source Record & Co	Sony VO9800		1								$13,381.00	$13,381.00
Umatic Editor	Sony VO 9850								2		$6,900.00	$13,800.00
VCR	Emerson 755				2						$188.96	$377.92
VCR	Sony BVU950								1		$12,700.00	$12,700.00
VCR	Sony BVU 950								1		$12,950.00	$12,950.00
												419281.41

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
VCR	Zenith VRF 250								3		$329.50	$988.50
VCR	Zenith VRE550HF	25									$460.00	$11,500.00
Zenith VRE VCR (S-VHS)	VRE550							1			$549.00	$549.00
Video Camera & Color Display	VRE 550 HF	117	1		1	37		69		5	$732.00	$167,628.00
Video Cassette Play	Sony BVU 900								1		$11,100.00	$11,100.00
Video Cassette Player	Sony BVU 900								2		$8,695.00	$17,390.00
Video Cassettee Record	Portable Sony								2		$12,646.00	$25,292.00
Video Dist. Amplifier	Grass Valley								1		$160.00	$160.00
Video Dist. Amplifier	Video VDA 16								2		$247.75	$495.50
Video Eq. DA.	GVG 8502						8				$220.00	$1,760.00
Video Projection System	PT-105/72									1	$6,050.00	$6,050.00
Video Projector	Sony 1042Q									1	$4,997.02	$4,997.02
Video Projector Color	Panasonic PT101Y							1			$4,605.00	$4,605.00
Video Switcher	2250A									1	$7,457.00	$7,457.00
Video Switcher	AG-SW100									1	$701.00	$701.00
Video Switcher	Sony SCG 2550								1		$4,410.00	$4,410.00
Video Switcher	SEG2550								1		$9,600.00	$9,600.00
Videocassette Player	Sony BVU900								3		$7,300.00	$21,900.00
Videotek ADA-16	Audio D.A.'s								3		$247.00	$741.00
Videotek Switcher	VIS-1201								1		$325.00	$325.00
Viewfinder	Sony DXF50-5"								1		$784.10	$784.10
Viewfinder Replacement	Sony		1								$490.00	$490.00
Viewer PC										1	$574.00	$574.00
Visualizer	Wolf							1			$3,104.89	$3,104.89
Voltage Regulators	2Tripplite LC120		3								$275.67	$827.01
Wave Form/Vectorscope	Videotek TVM 620								2		$3,465.00	$6,930.00
Wireless Microphone	CETEC VEGA		2								$733.00	$1,466.00
Wireless Port. Diversity	CETEC VEGA		2								$1,136.00	$2,272.00
												$314,097.02

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Electronic Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Zenith Supersport Mod. 2	ZFL-184-01							1			$1,204.26	$1,204.26
Zenith Supersport Mod. 20	ZA-180-57							1			$1,804.26	$1,804.26
	Unit Totals	287	45	0	6	104	200	151	135	136		$3,008.52
						TOTAL ELECTRONIC EQUIPMENT						$1,532,432.06

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Audio Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Auditing Controller	BVE900									1	$6,848.00	$6,848.00
Amplifier Audio	ADA 210									1	$530.00	$530.00
Amplifier Tray	Videotek Dist. DAT								1		$60.00	$60.00
ARCNET Active Hub	Standard								1		$387.96	$387.96
Audio Cassette Deck	TASCAM 112								2		$570.00	$1,140.00
Audio D.A.	Grass Valley								2		$250.00	$500.00
Audio D.A.	Videotek VDA-16								1		$247.00	$247.00
Audio Delay Unit Digitech		1									$300.00	$300.00
Audio Mixer	Sony MXP 21								1		$1,330.00	$1,330.00
Audio Mixer	Sony MXP 29								1		$3,215.00	$3,215.00
Audio Mixer Portable	Ramsa							1			$800.00	$800.00
Audio Video Distr.	A6-DA 100								1		$672.00	$672.00
Channel Audio Mixer	MXP -29/8									1	$2,924.00	$2,924.00
Distributor Audio/VI	AG-DA100									1	$624.00	$624.00
Handheld Wireless Transmitter	VELA T82		1								$999.99	$999.99
Headset	Sony MDR-V6						5				$70.00	$350.00
Intercom Head Set	Sony DR-100								3		$92.00	$276.00
Port. FM Audio Modulator	GVG	1									$641.00	$641.00
Portable Receiver	GVG	1									$1,337.00	$1,337.00
Portable FM Audio Demodulator	GVG	1									$641.00	$641.00
Recorder	CVR75	2									$29,995.00	$59,990.00
Shure Audio Mixer	M267								1		$390.00	$390.00
Shure Audio Mixer	M267								1		$1,514.02	$1,514.02
Sony Headset	DR-104								8		$85.00	$680.00
Speaker	JBL4408								2		$209.00	$418.00
Speaker Mount	JBL Control								1		$33.00	$33.00
Speaker System	JBL Control 1								1		$152.00	$152.00
Sync Dist. Amplifier	Videotech SDA 14								1		$340.00	$340.00
TRS Headset	51103XD								1		$135.00	$135.00
Voice Recognition Unit								2			$805.00	$1,610.00
	Unit Totals	6	1	0	0	0	5	3	29	4		$89,084.97
						TOTAL AUDIO EQUIPMENT						$89,084.97

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Office Equipment	Model/Brand	KS	KU	REC	MJ	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
19" Rackmount	Panasonic		1								$696.05	$696.05
5 Executive Highback Chairs	671(4)671(1)		5								$292.40	$1,462.00
Anvil Modular Case System	MW505		1								$895.00	$895.00
Add on units, cabinets			1								$1,051.06	$1,051.06
Cabinet Comb. Unit	VTRC	3								10	$580.00	$7,540.00
Camera Truck			1								$7,225.00	$7,225.00
Cannon Fax Machine	705							1			$2,996.00	$2,996.00
Carrying Case	Sony DXC-1001		1								$205.00	$205.00
Cellular Telephone	Phone, Battery								1		$447.00	$447.00
Copier	Panasonic FP26-25			1							$3,865.00	$3,865.00
Copier	Sharp							1			$3,181.08	$3,181.08
Cordless Phone	Panasonic	90				36		66		5	$117.00	$23,049.00
Desk				1							$807.00	$807.00
Dolly Wheels	ITE D-5								2		$340.00	$680.00
Equipment Console	Winstead G8531								1		$1,230.00	$1,230.00
Fax Machine	Murata F-50		1	1							$2,097.25	$4,194.50
Fax Machine	F0550									1	$1,031.24	$1,031.24
Fax Machine	G77									5	$1,469.00	$7,345.00
File Cabinet	Model H-682				1						$179.80	$179.80
Heavy Duty Roadcase for 2 rec.	CETEC VEGA 150		1								$145.00	$145.00
HUM Bucker	ADC								1		$115.00	$115.00
IBM Personal Wheelwriter	6781							1			$479.00	$479.00
Jacks Dual	22B						22				$814.00	$17,908.00
Lighting System								1			$4,176.85	$4,176.85
Light Accessories	Matthews C		1								$998.02	$998.02
Panasonic Cordless Phone	KX 3842							1			$1,053.00	$1,053.00
Panasonic Cordless Phone	KXT 3842							1			$732.00	$732.00
Panel	Dynatech Phenolic						1				$88.00	$88.00
Phone Bridger	Getner Digital Hybrid								1		$2,000.00	$2,000.00
Phone Bridger	Getner Digital Hybrid							2			$1,465.00	$2,930.00
												$98,704.60

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Office Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Portable 5MPTE Time Code	Sony		1								$673.53	$673.53
Production Van	1989 Ford/138								1		$50,200.00	$50,200.00
Rack Mount Power Panel	Winstead		1								$260.00	$260.00
Rack Shelf	TSM 5 VSM 5								1		$200.00	$200.00
Rack Shelves	Sony RAM 1800								4		$135.00	$540.00
Rack Slide	RMM 501								1		$231.73	$231.73
Rack Slide	RMM 950								1		$256.00	$256.00
Rack Slide	Sony								1		$219.00	$219.00
Rackmount for TBC Remote	Microtime							1			$90.00	$90.00
Rackmount Fiber Optics	GVG	1									$1,143.00	$1,143.00
Rackmount Transmitter	GVG	1									$1,337.00	$1,337.00
Rackmount FM Audio Modulator	GVG	2									$641.00	$1,282.00
Rackmount Receiver	GVG	1									$1,337.00	$1,337.00
Rackmount	Sony RMM 1800								1		$119.00	$119.00
Rackmount Vertical Switcher	Videotek RS-12		2								$775.00	$1,550.00
Rackmount	Sony DMM 1800								2		$95.50	$191.00
Rackmount	Winsted		1								$260.00	$260.00
Rackmount Time Code	Sony		1								$1,007.75	$1,007.75
Rackmount Adaptors	Ikegami							1			$202.00	$202.00
Rackmount Kit	RMM-850						2				$290.00	$580.00
Recharged Toner Cartridge	Laserwriter		1								$42.00	$42.00
Service Manual			1								$898.56	$898.56
Set of 2 side panels									1		$132.51	$132.51
Tascam Roll Aroun.. Rack	CS607B		1								$370.00	$370.00
TV Cart	Bretford								3		$118.00	$354.00
TV/VCR Cabinet	Thompson	45								6	$580.00	$29,580.00
TV/VCR Cabinet	VTRC 70 E							1			$5,220.00	$5,220.00
TV/VCR Cabinet	VTTRC 70E							1			$3,450.00	$3,450.00
TV/VCR Cabinet	Bretford VTRC 70	25								2	$575.00	$15,525.00
TV/VCR Security Cabinet	Bretford	50				35		66		5	$580.00	$90,480.00
Typewriter	10									2	$642.00	$1,284.00
												$209,015.08

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Office Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
Typewriter	IBM Model 30							2			$869.00	$1,738.00
Typewriter	IBM							1			$479.00	$479.00
Typewriter	IBM 6783									1	$608.40	$608.40
Umatic Editor	Sony VO 9850								2		$6,900.00	$13,800.00
Uni-set Studio Piece	Modular Storage								1		$8,253.00	$8,253.00
User Station RTS									5		$198.00	$990.00
Winstead Shelf	85585								1		$115.00	$115.00
Wall Material	Ponderosa #3009								1		$2,220.00	$2,220.00
1000 Watt Focusing	4800-7TR-BM								2		$469.95	$939.90
	Unit Totals	218	22	3	1	71	25	147	34	37		$29,143.30
						TOTAL OFFICE EQUIPMENT						$336,862.98

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT INVENTORY

Miscellaneous Equipment	Model/Brand	KS	KU	REC	MU	OKAS	OKETS	MS	MO	UAB	Unit Price	Total Price
1 a0mm to 120mm Focal	Sony		1								$1,674.70	$1,674.70
10' Castor Frenel	350 ITV-6P-SL7								4		$848.00	$3,392.00
Castors	Sony RME 5500		1								$851.00	$851.00
14" Focusing Scoops									2		$387.50	$775.00
29.5mm to 143mm focal	Sony		2								$1,928.27	$3,856.54
6" Polaris Fresnels	330 ITU 7 Access								7		$505.00	$3,535.00
3" Industrial Castors	Winsted		1								$11.22	$11.22
Sennheiser Short Tube Cond.	Mike-MK-M416		1								$752.75	$752.75
Vista 18 Switcher	Ampex	1									$39,907.00	$39,907.00
ADO 100	Ampex	1									$30,680.00	$30,680.00
	Unit Totals	2	6	0	0	0	0	0	13	0		$85,435.21
						TOTAL MISCELLANEOUS EQUIPMENT						$85,435.21
						GRAND TOTAL						$4,373,943.66

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APPENDIX C

"Training Local Personnel for Distance Learning Programs: The Mississippi Star Schools Model"

Training Local Personnel for Distance Learning Programs: The Mississippi Star Schools Model

by DR. ROBERT YOUNG, Director
Division of Distance Learning
Mississippi Authority for Educational Television
Jackson, Miss.
and DR. SUSAN MCCLELLAND, Assistant Professor
University of Alabama
Tuscaloosa, Ala.

The purpose of the federal Sta· Schools Project is to demonstrate how telecommunication technology can be used as a tool to improve instruction in America's K-12 schools. The project concentrates on the satellite delivery of student courses in mathematics, science and foreign language to isolated rural schools. Mississippi, a state with many such schools, was a member of three of the four consortia receiving Star School funding in 1988.

As a member of the Midlands Consortium,[1] the University of Mississippi's Office of Distance Learning (ODL) took on the task of developing a training model for local school personnel.[2] Our Mississippi Model, as it came to be called, was intended to be utilized by other states and school districts as they initiated satellite-delivered distance learning programs.

Training Deemed Crucial

Training of the local teacher is crucial to distance learning programs. According to the 1989 study of distance learning prepared for the U.S. Congress by the Office of Technology Assessment, "the key to success in distance learning is the (classroom) teacher."[3] The OTA report also points out that few teachers have either the specialized teacher education or the field experience to be effective distance learning instructors or to use this technology successfully in their own classrooms.

Because there were so few schools in Mississippi with satellite-receiving equipment in 1988, the Star Schools consortia first concentrated on placing equipment. The Midlands Consortium placed downlinking equipment in 62 Mississippi schools in Year One (1988/89) and in an additional 15 schools in Year Two (1989/90).

To train the teachers and other school personnel in these widely scattered schools, the ODL hired three experienced classroom teachers as educational coordinators. Their role in the Star Schools Project was to develop a paradigm to successfully train the school administrators and teaching partners (local classroom teachers) in the use of satellite-delivered student courses, student enrichment classes and staff-development programs. Such programming is available from a variety of producers.

> The ODL developed training manuals for both administrators and teaching partners.

The first step in the development of the Mississippi Model was to introduce the district administrators to the potential of distance learning and to the key functions that they would fulfill, such as selecting equipment, courses and students.

Administrator Training

In the summer of 1989, after the satellite-transmission receiving equipment was installed but before school started, two of the educational coordinators traveled to all 62 Midlands downlink sites in Missis-

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sippi—a total of 3,500 miles. These on-site visits were considered essential for several reasons.

First, the ODL staff believed the principals and superintendents of these small, rural schools would be more likely to make a commitment to the success of the Star Schools Project if they saw evidence of a personal investment being made by the university's staff. These face-to-face meetings were also intended to make the school administrators feel more at ease about calling the toll-free number at the ODL in the months to come with questions, problems and helpful feedback.

A collegial relationship was established between TV teachers and their teaching partners.

On-site visits were also to make sure the transmission-receiving hardware was operational, to program the basic satellites into the receiver, and to give the administrators hands-on practice with the equipment. If the technology was to be used effectively, as many potential technical problems needed to be prevented as possible. But human concerns had to be dealt with as well. This need for raising the "comfort level" with the satellite equipment was addressed in the model's teaching-partner training.

The ODL developed training manuals for both administrators and teaching partners. Administrators received these manuals during the on-site visits. The Administrator's Manual discusses distance learning in general and also covers more specific topics such as:

- the administrator's role;
- developing districtwide distance learning policies;
- student programming;
- teacher/staff development programming;
- the teaching partner's role;
- selection of students;
- evaluation of satellite-delivered instruction;
- satellite equipment;
- technical terms;
- other uses of satellite equipment; and
- networking with other Mississippi schools.

A job description, interview schedule and appraisal instrument for the teaching partner are also included in the Administrator's Manual to aid principals in the important task of selecting the best teaching partner for a satellite class.

These manuals serve as a quick reference guide for local school administrators to help them prevent, or solve, some of the problems associated with satellite instruction. Principals and superintendents also found the manual helpful in reducing their anxieties about venturing into satellite instruction. The Mississippi State Department of Education continues to provide these manuals to interested school administrators and teachers.

EDDIE PEARL LYONS, TEACHING PARTNER, ORIENTS COLLEAGUES ON SOFTWARE FOR SATELLITE CLASSES

Training of Teaching Partners

The next step in the Mississippi model involves the teaching partners. The teaching partner acts as a liaison between the students and the satellite teacher while also managing the local classroom. This person is responsible for operating the equipment and participating in the evaluation of the course, in addition to performing the following duties which parallel the duties of a regular classroom teacher:

- maintaining appropriate paperwork;
- creating a proper learning environment;
- motivating students and monitoring progress; and
- coordinating testing at the local-school level.

To help the teaching partners to prepare for and succeed in their new, challenging role, we brought them to the Ole Miss campus for a one-day training session. These were scheduled after the administrator training but before the beginning of school.

Because of the large number of teaching partners (over 60) to be trained during Year One, training was scheduled by course subject area. We brought the on-camera teachers to the training for three of the more popular courses [Spanish I (KSU), German I by Satellite (OSU), and Basic English and Reading (OSU)]. Being able to introduce our teaching partners to their television colleagues prior to classes proved invaluable. Teaching partners heard about the courses from "the horse's mouth"—many questions were answered and many fears allayed. After meeting the television teacher, teaching partners felt more comfortable about calling them on the phone with questions and concerns. A collegial relationship was established. During this phase in Year Two, only one television instructor was brought in; our own by-then experienced teaching partners took over the rest of the course-specific training of new teaching partners.

Also during Year One training, the ODL staff brought the other television instructors to Mississippi by phone. After an introduction to the satellite course they were to facilitate and after a review of the course materials with one of the educational coordinators, several teaching partners spoke with their electronic mentor over the telephone. This phone link was a cost-efficient way of establishing the lines of communication between the television instructor and the classroom teaching partner.

Information that was not course-specific was presented by the educational coordinators. Topics covered included effective management of the satellite classroom, hands-on practice with the satellite-receiving equipment and the computer software, and an overview of the Teaching Partner's Manual.

The initial administrator and teaching partner training provided school personnel with the information and skills necessary to begin distance learning programs in their schools. Additional information on national distance education issues, Mississippi State Department of Education policies, and the sharing of solutions to mutual problems were provided, in part, by a statewide distance learning conference.

CHUCK THORPE, TV TEACHER FOR SPANISH I, DISCUSSES COURSE OBJECTIVES WITH PARTNERS

Distance Learning Conference

In November, 1989, The University of Mississippi's ODL, Apple Computer, 4-County Electric Power Association, and the Mississippi State Department of Education cosponsored The First Annual Mississippi Conference on Distance Learning. Personnel from all three Star Schools Consortia in the state were invited, as were administrators from every school district and other interested parties.

Speakers and presenters from across the country participated in the two-day conference. Distance learning technology was showcased through two live, interactive broadcasts from Oklahoma State University and the Missouri School Boards Association. Key uses of satellite technology in education—instructional programming, staff development, enrichment and community education—were highlighted in these sessions.

Teachers and administrators who attended were also offered a choice of several concurrent sessions. Some sessions were designed specifically for teaching partners, and dealt with student motivation, efficient and effective recordkeeping, study skills and distance learning applications in the elementary school. An Apple lab was provided by Apple Computer, Inc. for hands-on experience with the satellite course software, and a concurrent session focused on using computers to record and compute grades, create data banks and word process.

A teleconference focused on how schools might make full use of their satellite equipment.

Administrator sessions dealing with the variety of staff development offerings, how to fund satellite instruction and future directions in distance learning were also presented. The conference also offered opportunities to establish networks among fellow distance learning practitioners. In addition, short informal meetings were held for the Midlands Consortium's teaching partners so that they could meet their fellow teachers in the state involved with the same satellite course.

Teleconference and Newsletter

As a part of the effort to keep Mississippi's distance learning practitioners up-to-date, The University of Mississippi's ODL produced a live, interactive teleconference for school administrators and teachers in September 1990. The program focused on how schools and communities might make full use of their satellite equipment. The 75-minute teleconference closed with a Q&A session. All schools from Mississippi's three Star School Projects were encouraged to view the programming live and tape it for further use. Thirty-four sites received the teleconference and some sites registered as many as 20 people to view the program live.

The Mississippi Model also updated satellite schools from all three consortia in Mississippi through the distance learning newsletter, "Uplink." This newsletter was sent to all satellite schools and other interested agencies and individuals four times during the school year. Much of the information on satellite-delivered teleconferences and enrichment programs is scattered and difficult to locate. This is especially true for the

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often overworked faculty and staff in small rural schools. "Uplink" attempted to collect this information and provide it to all Mississippi satellite schools. It also featured local school "success" stories and imaginative uses and applications of K-12 distance learning programs. Answers to technical questions and information about state distance learning policies were also often included.

Conclusion

The Mississippi Model was recently validated by its training of local school personnel involved in the Mississippi 2000 Project *(described in T.H.E.'s August 1991 issue)*. The application of principles developed for satellite-delivered courses was also found to be highly appropriate for a fiber optic-based distance learning network.

> It is easy to over-emphasize the technological and production-oriented aspects.

As other states, regional educational cooperatives and individual school districts become involved in distance education, appropriate training for local school personnel must be emphasized as a vital key to a project's success. The technology of distance learning may dazzle school boards, parents and community members. The skill of the television teacher and the production quality of satellite courses often inspire students, teachers and administrators. It is therefore easy to over-emphasize the technological and production-oriented aspects of distance learning and to overlook an equally important part of the triad: the local teaching partner.

Well-trained and motivated teaching partners and school administrators are essential to the attainment of the educational goals of distance learning programs. The Mississippi Model, developed and redefined through the training of nearly 500 school administrators and teaching partners, has evolved into a successful training program that can be adopted and adapted by others entering the arena of distance learning. Those in charge—whether representing multi-state consortia or individual school districts—must nurture the professional growth of the local school personnel who have the most direct impact on students. ■

During the Star Schools Project, Robert Young *was director of the Midlands Consortium's Star Schools Project in Mississippi, director of the Office of Distance Learning, and an associate professor in the school of education at The University of Mississippi. He currently directs all distance learning and instructional television projects for Mississippi ETV, including being the interim project director of Mississippi 2000.*

Susan McClelland, *former educational coordinator at The University of Mississippi's Office of Distance Learning, worked on both the Star Schools Project and a U.S. Department of Education Comprehensive School Health Education Program grant: Health Star. Health Star provides fifth- and sixth-grade level health-education programming via satellite. She is currently a faculty member in the College of Education at the University of Alabama.*

References:

1. Midlands Consortium members were: The University of Alabama-Birmingham, Kansas State University, The University of Kansas, The University of Mississippi, Missouri Schools Boards Association and Oklahoma State University.
2. Funding for the Mississippi Star Schools Model was provided through a grant from the U.S. Department of Education (#R203A80036).
3. Congress, Office of Technology Assessment, *Linking for Learning: A New Course for Education*, OTA-430. Washington, DC: U.S. Government Printing Office, November, 1989, p. 87.

APPENDIX D

Sample Newspaper Articles on Mississippi Star Schools

Mississippi schools participate in STAR

By CHARLOTTE WOOD

DM Staff Writer

In Mississippi alone 62 schools are participating in the STAR Schools satellite education program. The STAR program is funded by a $1-million dollar grant from the United States Department of Education.

The funding was used to equip each participating school with a satellite downlink, and video equipment to provide students in kindergarten through 12th grade with class sessions aired live via satellite.

The University of Mississippi represents Mississippi in the Midlands Consortium, which was initially awarded $5.5 million in federal satellite education last fall. Others awarded funding for the STAR program include Alabama, Kansas, Missouri and Oklahoma.

The first broadcast of the STAR program occurred on August 28th. The courses offered to the participating schools include Spanish, German, Russian, basic English and reading, advanced placement physics, applied economics and advanced placement chemistry, said Linda Bennett, one of the two educational coordinators for the Office of Distance Learning. High school students in advanced placement courses may apply the hours they receive from the program towards college credit, provided they take and pass the exam at the end of the course.

"The main purpose of the STAR program is to target those smaller schools and schools that are unable to hire a teacher for an advanced placement course consisting of only six students the opportunity to be provided with the courses they otherwise couldn't afford," said William Cole, one of the educational coordinators at The Office for Distance Learning at the University of Mississippi.

The objective of the program is to have satellite educational program that includes two to three days a week of interactive viewing, along with two days for the interaction with the local teachers and computer-assisted instruction.

The Office for Distance Learning recently completed a facilitator training for the participating teachers so that they may receive specialized course instruction and learn detailed information about the STAR schools and equipment.

The satellite course instructors who were responsible for training during the sessions were as follows: Chuck Thorpe of Kansas State University, and Joyce Nichols and Harry Wohlert, both of Oklahoma University.

"We anticipate getting an uplink here at the University of Mississippi," Cole said. "We are hoping to get one in October 1989 when the second-year of funding is expected to come in."

Thad Cochran visits Ole Miss

By DENTON GIBBES
Daily Journal Oxford Bureau

UNIVERSITY – U.S. Sen. Thad Cochran is touring the state's centers of learning during breaks from his duties in Washington, D.C., in an effort to stay up to date on the state of education in Mississippi.

Cochran spent Tuesday at Ole Miss, hearing about the installation of the federally funded STAR Schools program, learning about progress at the National Center for Physical Acoustics, hearing about the plans for the Natural Products Center at the school of pharmacy and meeting with university and student leaders.

"As a practical matter, I'm trying to spend as much time as I can on college campuses and in classrooms to learn as much as possible about education in Mississippi," Republican Cochran said. "I'm seeing much more of a serious commitment to excellence in education, and I'm seeing us do a better job."

Cochran, who said he will seek a third Senate term in 1990, said the visits are not part of a plan to develop a re-election campaign around his work in education, but only to gather information that will aid him in his congressional duties. This is the first year the Pontotoc native has received assignment to U.S. Senate subcommittees that provide him with double barrel input into both the authorization and funding levels of federal educational programs.

Cochran, a spokesman said, wants to be known as an "education senator."

"I'm trying to better acquaint myself with the interests here," Cochran said. "We have national interests here at the university. Construction is under way on the National Center for Physical Acoustics, which performs research for the Department of Defense and Department of Agriculture and the university is providing very important leadership in STAR Schools program, a national demonstration project using satellite technology to enlarge classroom offerings."

Cochran received firsthand instruction Tuesday on the potential of the STAR Schools program.

In Mississippi, 112 schools will be equipped with satellite dishes and video equipment so students in kindergarten through 12th grade can participate in actual class sessions aired live via satellite from other locations across the country. Special telephone hookups will make interactive conversation possible during the sessions that will be geared primarily toward science, mathematics and foreign languages.

The U.S. Department of Education awarded $1 million to Ole Miss to place downlinks in 65 state schools and to provide training for the more than 100 teachers who will utilize the system statewide. Mississippi State University and the Mississippi Authority for Educational Television also received program funding from the government to place downlinks in schools across the state.

"Before we had this kind of program, students only had access to the teacher in the classroom," Mississippi's senior senator said. "This may just revolutionize the delivery of instruction in the classroom. It's great we've (Mississippi) got our foot in the door."

Cochran said, like all federally funded programs, efforts will have to be made to see funding continued.

Cochran's educational jaunts previously have taken him to Mississippi State University and to several Mississippi high schools. Today and Thursday he is scheduled to address high school students in Pontotoc and Ripley.

Cochran discusses the STAR Schools program with Robert Young, director of the C... Distance Learning at Ole Miss, and Gerald Walton, associate vice chancellor for academ...

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Northeast Mississippi Daily Journal, Friday, September 16, 1988

Video teaching in state studied

By NORMA FIELDS
Daily Journal Jackson Bureau

JACKSON — Mississippi schoolchildren may soon find themselves learning exotic foreign languages or other enrichment courses by videotape and computer, without a certified teacher in the classroom.

The Commission on School Accreditation has named a committee to probe the impact of video teaching on accreditation standards.

The panel was named in the wake of developing technology allowing a wide range of courses to be taught by the use of videotape and computers.

Utah public schools now teach Spanish I and II using the new technology and "classroom managers" rather than teachers certified in the subject matter.

That state initiated the new teaching method when college entrance requirements were increased in Utah, a largely rural state, to include two years of foreign language. The schools there have found "no significant difference" between a teacher standing before a classroom to teach the courses and using the new video technology, Dr. Richard C. Boyd said.

Boyd, the state superintendent of education, called the advancement of the technology "the last major accreditation issue that we need to face."

He said the issue is how to define a course offering under accreditation standards.

Accreditation Commission chairman John Curlee said he has named a committee to bring an overall report to the commission about all aspects of the new instruction technology.

"It's a board subject right now, and we did not place any limits on this committee," Curlee said. "We have two sites now offering this — New Hope in Lowndes County and Ackerman. It did not cost them an awful lot to get into it."

German is being taught at New Hope and in Ackerman in pilot programs using the video technology, while Greene County is ready to move into the field.

> The panel was named in the wake of developing technology allowing a wide range of courses to be taught by the use of videotape and computers.

Three consortia in Mississippi already have been notified they will receive federal funds for developing instructional programs in the medium. Midlands Consortium at the University of Mississippi, TI-IN United Star Network at Mississippi State University, and SERC, a consortium in which former ETV Director Lee Morris is involved, are offering or preparing to offer courses. SERC already is ffering beginning Japanese and statistics and probability courses, according to Boyd.

"We're at the threshold right here," he told a joint meeting of the state Board of Education and the Commission on Accreditation.

"It's a very exciting prospect," Curlee said. "I was surprised that they (Utah) found very little difference (in learning results). It's not going to be very expensive."

Boyd told the group the technology may be the way to deliver staff development courses required by the Education Reform Act, as well as foreign language instruction and other courses.

"It's futuristic, but not futuristic for 10 years from now. It's more like next year," he said.

During the lengthy joint meeting Thursday, both bodies discussed numerous accreditation matters in an effort to come to an agreement about the new performance-based school accreditation system.

THE OXFORD EAGLE OXFORD, MISSISSIPPI

Lafayette extended invitation to be part of new program

By DAVID MAGEE
EAGLE Staff Writer

Lafayette County has been extended an invitation to be one of 65 schools in the state to participate in the new STAR Schools satellite education program, County School Superintendent Jimmy Nelson said.

The STAR program, designed for schools which show the most academic need, will equip the schools with their own satellite downlinks and other video equipment so that students in kindergarten through 12th grade can participate in actual class sessions aired live via satellite.

"It's still in the planning stages," Nelson said. "They did extend an invitation for Lafayette to participate in it. But I don't think they've made a decision about the schools yet."

The two-year program, which will be represented in the state by Ole Miss, will be conducted in five rural states. Ole Miss will receive $[illegible] million of the $5.5 million grant from the U.S. Department of Education.

A permanent training center, known as the Center of Distance Learning, will be set up at Ole Miss to instruct teachers and administrators from the schools on effectively employing the new technology.

Dr. Robert A. Young, associate professor at Ole Miss and director of the demonstration grant, is working closely with the state Department of Education to select the state's 65 schools.

"(Lafayette) may be (one) but a decision hasn't been made," Young said. "I will say that we think it's important to have a school from the local area.

"Part of our program requirements are that it be a teaching tool," Young said. "We want to be able to observe the program and it would be very convenient with a school in the area. So it's safe to say there will be at least one in the community."

Nelson said he thinks the program, which would focus on science, mathematics, and foreign languages, would strengthen the county school system if it was involved.

"I think it's great really," he said. "I feel like it will be great for the school. Dr. Jim Payne (dean of the Ole Miss School of Education) met with the school board last month to discuss the program with the school. We are definitely interested in it."

Schools involved in the program will take part in live teaching sessions beamed by satellite to on-site dishes. Special telephone hookups will also be installed making interactive conversation possible during the class sessions.

Young said about 20 schools will be selected to get the program started and satellites and video equipment will be installed at those schools within the next month or two.

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Northeast Mississippi **Daily Journal**

A Locally Owned Newspaper Dedicated to the Service of God and Mankind — 25¢ — Vol. 115 No.

[W]ednesday, October 5, 1988

Satellite programs approved

By DENTON GIBBES
[illegible] Journal Oxford Bureau

UNIVERSITY — Federal grants to three state institutions could have administrators in Mississippi schools shouting "beam it down, Scotty."

In the largest grant, the University of Mississippi has been awarded $1 million from the U.S. Department of Education to implement a satellite instruction program in 65 Mississippi schools.

Mississippi State University will receive a $750,000 grant to install the satellite program in 33 schools the first year and 25 the following year.

Announced Monday by the Washington office of U.S. Rep. Jamie Whitten of Mississippi, the University of Mississippi will begin administering the new federal STAR Schools satellite education demonstrational program this fall.

Under the STAR School program, selected schools in the state will be equipped with satellite downlinks and other equipment including a video classroom so that students in kindergarten through 12th grade can participate in actual class sessions aired live via satellite. The programming will focus on science, mathematics and foreign languages.

The grant also calls for establishing a permanent training center at Ole Miss to instruct teachers and administrators from the schools on using the new technology.

Dr. Robert Young, director of the demonstration grant at Ole Miss, will work closely with the state Department of Education to select the 65 schools on the primary basis of academic need. Young and his staff will oversee the installation of satellite receiving equipment at each of the school sites.

Originating from different locations around the country, live teaching sessions beamed via satellite will be pulled by reception dishes into Mississippi classrooms. Special telephone hookups also will be installed making conversation possible during the satellite class sessions.

Ole Miss received the grant as a member of a multi-state consortium formed to compete for the STAR Schools funding. The Midlands Consortium, which Ole Miss is associated with, includes universities, public and private elementary and secondary schools, state departments of education and state school boards in association in Mississippi, Alabama, Kansas, Missouri and Oklahoma.

The consortium was one of four funded in a nationwide competition for $19.8 million in federal satellite education funding. The initial award to the Midlands Consortium

Turn to GRANT on Page 14A

The University of Mississippi has been awarded $1 million from the U.S. Department of Education to implement a satellite instruction program. Mississippi State University will receive a $750,000 grant and the Mississippi Authority for Educational Television and the state Department of Education will receive satellite educational program funding.

■ UM center awarded $105,000 grant.
—See Page 4A

Grant

Continued from Page 1A

is $5.5, with the collective standing to receive $10 million for its anticipated two-year participation in the program.

"This project presents an opportunity for both Mississippi and Ole Miss to take leadership roles in education reform," said Ole Miss Chancellor Gerald Turner. "We're excited about leading our state in this tremendous opportunity that this grant offers to demonstrate to the rest of the country how a rural state can use the latest technology to improve the quality of education."

The $1 million grant to Ole Miss is the largest of three similar projects in the state resulting from funding to three of the four consortiums.

Mississippi State University is receiving $750,000 in funding from the five-state TI-IN United Network Consortium. Mississippi State will place satellite downlink systems in 33 schools the first year and 25 more the second year of the program.

The Mississippi Authority for Educational Television and the state Department of Education also will receive satellite educational program funding from the 16-state Satellite Educational Resource Consortium, which received $5.6 million.

"It's significant that Mississippi has benefited from three of the four national grant programs," Young observed. "There's a definite need here in our state. I think that's demonstrated by the fact that three of the four grants have been made to consortiums that include Mississippi."

Young said he expects excellent cooperation and a limiting of duplication among the three grantees within the state.

Andy Mullins of the state Department of Education said the satellite education woul[d] ... secondary educa[tion] ...

The state bo[ard] ... quires schools ... outside of ... which puts a ... schools, Mullin[s] ...

"It's difficu[lt] ... the teachers ... these course[s] ... help such as ... can learn ... find or fund ... said. "So ... especially ... tricts that have ...

Northeast Mississippi Daily Journal, Tuesday, March 14, 1989

Local

West Point students to link up via satellite

By KRISTIE ALLEY
Daily Journal

WEST POINT — West Point High School students will interact with an Oklahoma teacher more than 500 miles away as they study an advanced course through a national satellite network this fall.

The Board of Trustees of the West Point School District rubber-stamped an agreement Monday with the STAR Schools Educational Satellite Network to install a satellite dish, provide a specially equipped video room and offer at least one satellite course in advanced math, science, social studies or foreign languages to juniors and seniors at the school.

"We're very excited about this," said West Point Superintendent of Education Thomas Lott. "This offers an opportunity that we couldn't possibly have otherwise. We think it's a good start toward getting some instruction that we, and most school districts, could not afford."

The school will receive the downlink from the University of Mississippi, which was awarded $1 million from the U.S. Department of Education to bring the STAR Schools program into 65 state schools. The university is a member of the Midlands Consortium of Distance Learning, Lott said.

Funding for the satellite education program was made available late last year when the U.S. Department of Education awarded $19.8 million in grants to four consortiums for the purchase of needed electronic equipment and educational programs in Mississippi and other states.

The Board of Trustees of the West Point School District rubber-stamped an agreement Monday with the STAR Schools Educational Satellite Network to install a satellite dish, provide a specially equipped video room and offer at least one satellite course in advanced math, science, social studies or foreign languages to juniors and seniors at the school.

During the live satellite classes, students will be able to interact with a teacher at Oklahoma State University in Stillwater, Okla., by using special telephone hookups, Lott said.

"It might be awhile before one of our kids would ask a question on the air," he said with a laugh.

As soon as the satellite dish is installed, the school will begin recording programs and coordinating an orientation and training program, he said. The school board will choose a curriculum by the end of April.

"The extent that we participate will determine how much money we will put into it," Lott said. "The program should be cost effective."

The school will pay about $24 per student each year, he said. If the school board employs someone to monitor the students, the course probably will be offered to about 10 students.

When the University of Mississippi, Mississippi State University and Mississippi Educational Television complete the network across the state, 109 schools will have a satellite program.

Mississippi State University will use a $750,000 grant to provide downlinks to 34 state schools, including Alcorn City Schools, Corinth City Schools, Tishomingo County Schools, Tupelo City Schools, Marshall County Schools and Holly Springs City Schools. The university is one of nine members belonging to the TI-IN United Star Network.

The Mississippi Authority for Educational Television has provided downlinks to Iuka High School, Houlka High School and eight other Mississippi schools through STAR Schools funding made available by the Satellite Educational Resource Consortium.

The schools participating in the University of Mississippi downlink have not been released yet by university officials.

A news release from the television network said the purpose of the grants is to "provide better learning opportunities for some of the nation's poorest schools by overcoming barriers of geography, wealth, race and culture."

VOL. 121 NO. 102 March 17, 1989
OXFORD, MISSISSIPPI THREE SECTIONS 36 PAGES

Local schools selected for STAR program

By BETTY BRENKERT
EAGLE Staff Writer

Oxford Elementary and Lafayette High are among 65 schools in Mississippi chosen from elite schools nationwide to receive satellite instruction by Fall 1989 as part of the STAR Schools Program.

The program will develop high-technology teaching networks to improve instruction quality in more than 1,000 schools in 39 states, mostly high schools. Oxford and Winona are the state's only elementary schools included in the project.

Office of Distance Learning Director Dr. Robert Young at the University of Mississippi said Thursday that satellite dish antennas and other equipment will be installed Monday at both local schools. "The (Oxford elementary) project is a pilot study to train youngsters in distance learning and will help in teacher training," Young said. Two programs being developed to teach foreign languages to elementary pupils won't be available until fall 1990.

All STAR schools will be equipped for two-way satellite and telephone communication to allow local schools to interact live with the programs. Mathematics, science and foreign languages will be emphasized, especially courses such as calculus, physics or languages that have traditionally been unavilable to students because of limited resources or lack of qualified teachers. Through STAR Schools funding, the schools will receive the satellite dish antennas and receiving equipment at no charge, making such courses widely available. Each school also can receive in-service workshops for teachers through the satellite network.

Although most classes now will be available for high schools, Young said the STAR program eventually will incl de kindergarten through 12th grade.

Oxford school Superintendent Bob McCord said he was pleased with the district's selection to participate in the program.

"We are looking forward to working with the program, particularly on staff development activities that will be made available to the school district," said McCord. "I am also pleased that we'll have through the STAR program an opportunity to see and observe model lessons that can be utilized throughout the curriculum. The elementary school now has grades three to five. However, the staff development activities throughout the coming school year will be accessible to teachers of all grade levels."

Lafayette County Superintendent of Education Jimmy Nelson concurredc with McCord's assessment of the program.

"We are just pleased to be a part of the STAR program and feel that it will be beneficial to the school and our students," said Nelson. "We haven't decided yet which courses we will utilize."

Water Valley Superintentent Keny Goodwin said his school system was aware of the program, but is not participating at this time.

The Midlands Consortium under which the local program will operate was one of four winners in the fierce nationwide competition for $19 million in new satellite education funding. The five-state consortium will receive $5.5 million the first year and the rest of the $10 million grant the second of its anticipated two-year participation.

Tippah scholars equal chance...

by Kenny Goode,
managing editor

Ripley and Blue Mountain High School students have a unique form of getting an education these days - the STAR Satellite Program.

Students actually learn a subject by watching a large-screen television via satellite. The dish sits just outside the classroom on the north side of the Ripley campus.

Ripley students are presently learning Pre-Calculus.

Students at Ripley are Donald Karpovich, Christi Massey, J. J. Gay and Penny Michael. Mrs. Edith Martin is teaching partner.

The teaching instructor in Oklahoma City actually asks for call-ins from students anywhere in the United States who might be tuning in to his particular class. Sometimes, he goes back over the problem, or tries to explain steps in further detail, when he receives a call from a student whether it be from Maine, Montana, Colorado or Florida...

The Ripley students don't have their phone hooked-up completed yet but are looking forward to the time when they will, not too far in the future.

Students take tests in their classroom but then mail them in to whatever location that the program originates.

"So far, they've made all 'A's'," Mrs. Martin said, praising the group of students.

"It's just like a classroom," J. J. Gay said. "If a student has a problem, they can request by phone the instructor to repeat the solution to a mathematical problem."

"And you have the advantage of being taught by someone with a Ph.D," the Ripley instructor related, explaining that STAR students receive the same education as the rest of the country, even if they do live in Mississippi.

"I like Fridays. On that day they have a program on, called 'Career Corner,'" a student noted.

The class is equipped to tape a program for referral later if necessary.

At Blue Mountain, the emphasis is on learning the German language.

Regina Gandy is the teaching partner there in a class with 10 students.

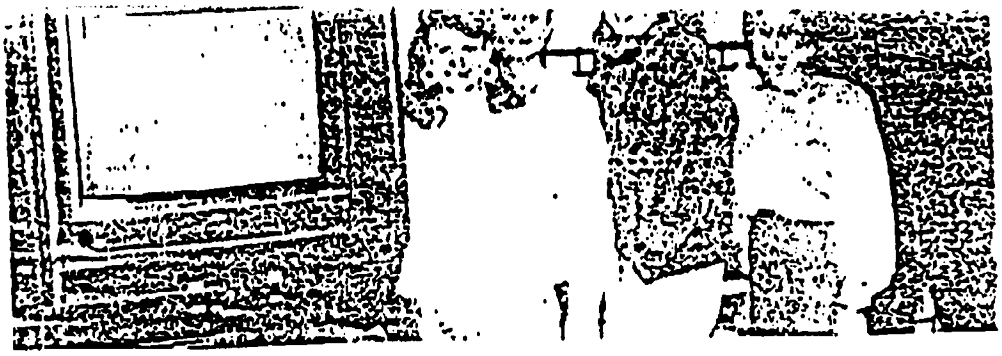
"Right now, the class has an overall B average but five of the students have A's," Mrs. Gandy said.

The Blue Mountain instructor said the class will receive special recognition if they can maintain an A average by the end of the year.

"The course is really a one-semester college level program but it's spread over the entire year instead of just one semester."

This allows the students to learn at a slower pace, said Mrs. Gandy.

Blue Mountain STAR students are Lisa Burns, Jeff Brewer, Tammy Lewis, Jennifer Kent, Milena Johnson, Jimmy Thomas, Tracy Rutherford, Amy Taylor, Jennifer Miller and Kim Williams.



Ripley STAR satellite students

From left, Stacey Massey, J. J. Gay, Penny Michael, Edith Martin, instructor and Donald Karpovich are STAR students   Staff photo by Kenny Goode.

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TIMES POST
Houston, Mississippi
WEEKLY

MAY-31-89

WHITLOCK VISITS OLE MISS—Okolona High School Principal Don Whitlock visits the Office of Distance Learning at The University of Mississippi. Along with Linda Bennett, educational coordinator of the STAR Schools project at Ole Miss, he is viewing a live-via-satellite genetics lesson originating at Kansas State University. The special enrichment program was being viewed simultaneously by students at Blue Mountain High School, Lafayette County High School, Ripley High School and Senatobia High School. Under the STAR program, a $1 million grant allotted to Ole Miss is providing Okolona High School, Houston High School and [illegible] other Mississippi elementary and secondary schools with the technological capabilities to receive live-via-satellite classes in mathematics, science, foreign languages and other subjects.

Keeping In Touch

by Senator Jack Da

Star Schools

Every student should have the opportunity to be "the best." Every school should be challenged to excel.

That is what the Star Schools Program is all about -- challenge and opportunity. Under this exciting new program, schools will be challenged to excel and will be offered a means of moving toward the goal.

Education in America has come a long way since the days when the basic equipment in a school was a shelf of books, a blackboard, and chalk. Today, millions of young people have access to good libraries, computers, and a host of other learning aids.

But better is not good enough. We live in a world of economic change. In order to compete and succeed, American schools should make the best possible use of modern technology.

Under the Star Schools Program, states will be able to create regional partnerships to deliver advanced coursework, via television, in languages, math, and science.

Missouri already is pioneering "long distance teaching" through the Education Satellite Network created by the Missouri School Boards Association. Early last year, I worked with the Association to secure funds to establish instruction via satellite. We succeeded, making it possible for Missouri schools to "tune in" new and challenging coursework.

Now, Missouri is among the states competing for demonstration funds under the Star Schools Program to expand satellite teaching. We have formed a regional partnership with Oklahoma, Kansas, Alabama, and Mississippi. Competition for funding is keen.

It is exciting to have Missouri in the vanguard of an effort to establish new frontiers in education. With the present satellite network, which could be enhanced by Star Schools, our students have access to college-level instruction.

In addition, communities can use the network for programming on economic development, agriculture, and other important topics as can benefit, but rural will gain the most.

Satellite teaching is an i advance for efforts to as quality education is ava every youngster in Miss children deserve an equa learning, whether they farms or in small towns, the cities. The best use of technology is to share a source -- advanced inst key subjects -- on a statew

I am proud to have help ellite teaching off the draw and into classrooms, an been a supporter of the S Program.

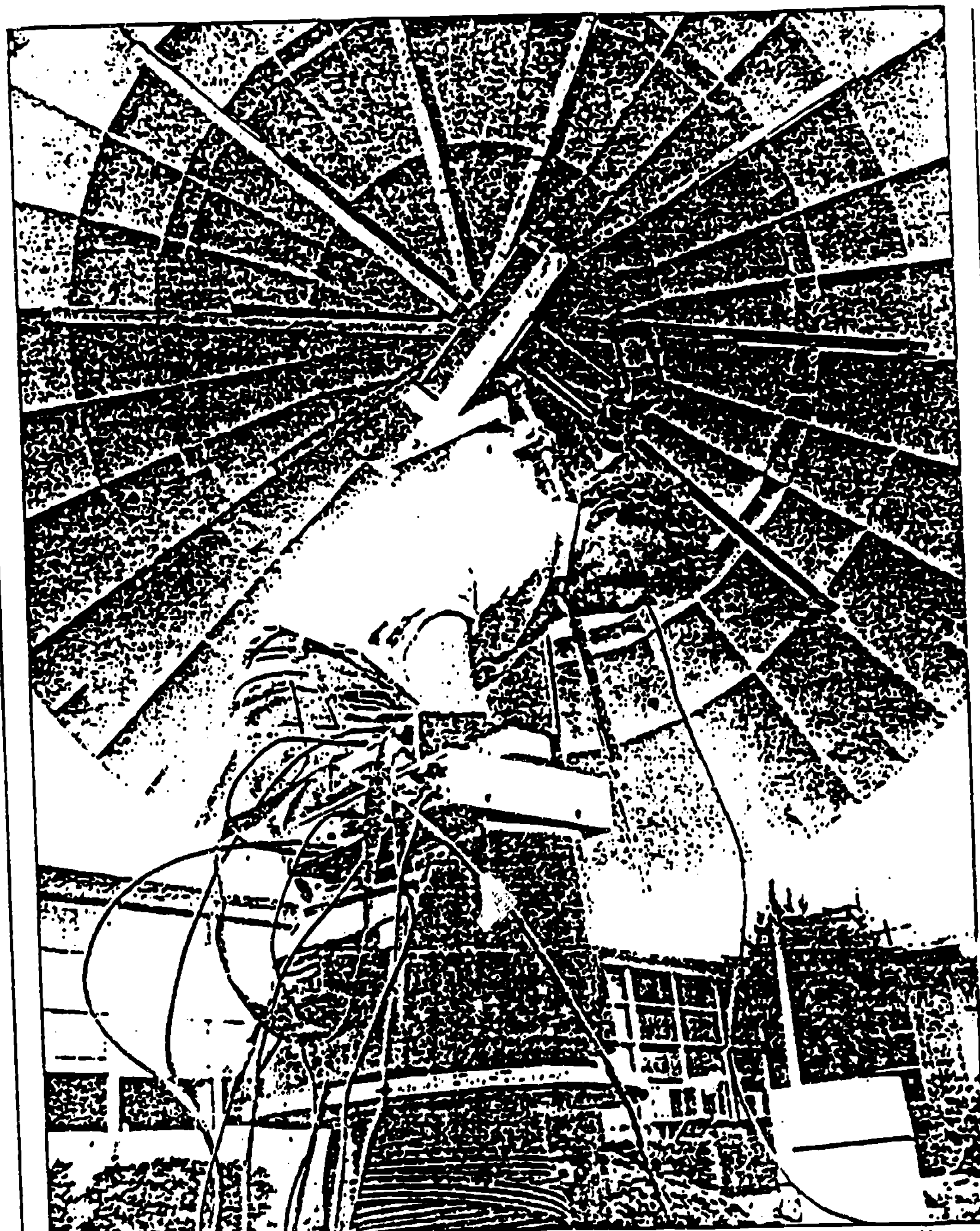

Photo by Bruce Newman

Workmen install a satellite dish at Lafayette High School. The dish is to be used in conjunction with the STAR Schools satellite education program.

Ole Miss Outfits 62 Schools With Satellite Hookups

By Elaine Pugh

Ole Miss will be helping to educate more than college students this fall when it completes the installation of satellite dishes in 62 Mississippi schools.

The dishes will enable the schools to receive classroom instruction from the STAR Schools satellite education program, which broadcasts live teaching sessions into classrooms nationwide.

The 62 schools picked for the program were chosen by the State Department of Education based on academic and financial need and interest in the program, said Dr. Robert A. Young, program director at Ole Miss. Other equipment to be installed in the schools includes video classrooms and telephone connections to make interactive conversation possible between students and their video instructors. Some of the STAR schools will also receive additional funds to pay programming subscription fees.

The schools will begin receiving classroom instruction this fall.

Soon, Young and his staff will also begin teacher training and school program evaluations at a permanent training center on the Ole Miss campus. The training and evaluation service will be available to all Mississippi teachers and administrators.

Satellite instruction in the STAR schools will focus on science, mathematics and foreign languages. Classsrooms at the reception sites will be supervised by a certified teacher, an assistant teacher or a paraprofessional.

To complement the STAR program and other satellite education programs in the state, Ole Miss will also broadcast nationally aired satellite instruction originating from the Oxford campus to meet any remaining programming needs.

Besides the 62 schools receiving equipment under the STAR program, two other schools will have the technology installed. Northeast Mississippi Electic Power Association is paying for equipment at West Union High School, and Carroll County is buying equipment for J.Z. George High in Carrollton.

The STAR program is funded by a $1 million grant to the five-state Midlands Consortium from the U.S. Department of Education. The consortium received an initial award of $5.5 million and stands to receive a total of $10 million for its anticipated two-year participation in the program.

Ole Miss represents Mississippi in the multi-state consortium. ◆

Southern Sentinel, Thursday, August 2, 1990, 11-D

Outstanding students in German

These Blue Mountain High School students were selected as outstanding students in the German by Satellite program and received the Outstanding Young Scholar's award. As only about 260 of the 2,200 students originally enrolled in German I and II met the strict criteria to be eligible for this award, it emphasizes the level of achievement for these students. Pictured are: (l-r) Milena Johnson, Jennifer Kent and Amy Taylor.

THE DAILY MISSISSIPPIAN

Weather—
Cold and windy
60% chance of rain
Wind 10-20 mph
High near 50
Low low 30s

UNIVERSITY, MS

TUESDAY, MARCH 21, 1989

UM to help equip schools for program

By TARA HART
DM Senior Staff Writer

The University of Mississippi is now helping to educate more than college students by directing the installation of satellite technology equipment in 62 Mississippi schools.

The equipment will provide instruction from the STAR schools satellite education program, which broadcasts lectures into classrooms nationwide.

The schools were chosen by the state department of education to receive the live-via-satellite instruction based on academic and financial need and interest in the program, said Robert A. Young, program director.

"It will definitely help the Mississippi school system," Young said. He said schools that have trouble finding specialized teachers, such as in foreign language, will now be able to offer a broader curriculum.

Equipment to be installed in the schools to pick up the broadcasts includes a video classroom and phone connections to enable students to ask their video teacher questions. Some schools will also receive additional funds to pay programming subscription fees. The classrooms will begin receiving classroom instruction this fall.

The university is also setting up units to train assistants to direct satellite classrooms, Young said. Two units will be on the Ole Miss campus and one will be in Jackson at the department of education. The teaching assistants will supervise tests and help answer questions.

. . . luating the program's effectiveness. "We will research whether the students learn as well in this program as they do in a conventional classroom," he said.

Once the program is fully operational and each school's needs have been evaluated, Ole Miss will begin broadcasting nationally-aired live-via-satellite instruction to meet any remaining programming needs.

STAR school programs will focus on science, mathematics and foreign languages, and the classrooms will be supervised by a certified teacher and an assistant teacher or paraprofessional.

A large number of different classes are already available live via satellite from colleges and universities nationwide and commercial vendors ... [illegible] to offer courses in a [illegible] range of subjects.

In addition to the 62 schools receiving equipment under the STAR program, two other schools are receiving funds from other means to have similar technology installed. In Union County, Northeast Mississippi Electric Power Association is paying for a unit to be installed at West Union High School, and Carroll County is paying for J.Z. George High School in Carrollton to receive a unit.

The STAR program is funded by a $1 million grant to the five-state Midlands Consortium from the U.S. Department of Education. The consortium, formed to compete for the STAR schools funding, received an initial award of $5.5 million and stands to receive a total of $10 million for its two-year participation in the program. Ole Miss is the Mississippi rep-

GIL THATER

EDUCATION VIA SATELLITE — Workmen install a satellite dish by the E.F. Yerby Center. The dish is to be used in conjunction with the ...

Northeast Mississippi Daily Journal

"Be Just — Fear Not"

Founded 1870 — Daily 1936

George McLean (1904-1983)
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Billy Crews
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Tom Pittman
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Johnnie Kelso
Chief Financial Officer

Satellite transmits learning opportunity

Mississippi is breaking new ground with the STAR Schools program.

Houlka High School senior Albert Moore created quite a disturbance Thursday at a special U.S. Senate subcommittee hearing in Jackson. But Moore's disruption was a welcome and refreshing demonstration of new knowledge brought to Mississippi's public schools on a satellite network.

Moore greeted the dignataries, including Sen. Thad Cochran, in Japanese. He learned the language through a pilot satellite and high technology teaching program called STAR Schools.

Moore's testimony and mastery of the subject were so good that he has been invited to testify next week in Washington at a more comprehensive hearing about the STAR program.

Mississippi and Alabama are the main laboratories in the $5.6 million STAR project, but four other states are involved. Next fall more than 100 of our public schools will be linked to the program. The University of Mississippi, Mississippi State University, the state Department of Education and Mississippi ETV provide the staff and equipment. The programs can originate in other states and at other universities. Trained teachers in Mississippi classrooms offer on-the-spot assistance.

Students can take the STAR project and other satellite classes for credit toward graduation, but the credits offered by satellite can't count toward school accreditation.

A full review of all satellite programs and classes is planned during the 1889-90 academic year. That's a progressive decision.

If the courses are found acceptable it is possible they could be included in the minimum accreditation standard of 25.5 courses required in every public high school. Students must earn 18 credits for graduation: four in English, two in mathematics, two in science, two in social studies and eight electives.

Satellite classes could help some rural, poorer school districts meet accreditation standards at less cost than with on-site teachers, with equally good results.

If the STAR project succeeds as its supporters expect, the way students are taught in Mississippi may change dramatically. It literally could mean that the world would become a classroom for our students.

One of the changes that may be needed is reforming the requirements for teacher certification. We shouldn't close the door to exciting possibilities in teaching and learning because of quibbles over courses in education methodology.

Mississippi was chosen as a major player in the pilot project because we have many poor, rural schools. It's difficult for them to offer foreign languages and advanced mathematics courses because funding is low and teachers for those subjects are scarce and expensive.

But Houlka's Albert Moore, and others like him, prove that Mississippi students can rise to a challenge if given the chance.

Mississippi is breaking new ground with satellite teaching. The federal government has provided the financial leadership. It's up to us to match that lead with an openness to innovation and new concepts in local school districts statewide.

success via satellite

By EILEEN GARRARD
Daily Journal

A summer breeze blew through the front door of a brown wooden house Friday as Albert Moore reflected on his time in high school and his dreams of the future.

Moore, the 18-year-old valedictorian at Houlka High School, has just graduated from one stage in his life and now he is ready for the next step in his education to begin.


Albert Moore

Two weeks ago, Moore finished what he calls the most memorable time in his life — his senior year in high school. Moore, dressed in a stylish blue shirt adorned with a state of Mississippi pen with Beta Club engraved on it, said at the beginning of his senior year, everyone was a bit standoffish but, as the year progressed and the end drew near, he said the 42 members of his graduating class grew closer.

Special events and activities began to draw the group together. One such event was the introduction of the Japanese language to Houlka High School via satellite.

The class gave students the chance to learn a language they probably would not have had the chance to under normal circumstances, he said. The special satellite class allowed Moore, the top student in his class, to put what he learned to use when he was chosen from his class to speak to the state Senate in Japanese to demonstrate the success of the satellite program.

Those who heard Moore at the state level were so impressed that they paid for him to fly to Washington to appear before a U.S. House of Representatives subcommittee to speak about the program. The trip was the first one Moore has made to Washington, he said.

Flipping through the pages of a thick, brown album, Moore looked up the date when he spoke before the subcommittee in Japanese. He said the whole experience was something he would never forget. "I was a little nervous when I spoke before the group," he said. "I was there to show them the effects of the program and that it was a good way to bring a big class to smalle[r] schools."

Moore said he was the only stu[dent] to speak before more than [...] people about the program. Since h[is] return, he said he has received le[t]ters of appreciation from Gov. R[ay] Mabus, Sen. Thad Cochran and t[he] director of the Satellite Educati[on] Resource Consortium.

The Japanese students taug[ht] Moore more than just classwork, [he] said. "They have more drive a[nd] more motivation to succeed. To [do] well in everything they do," [he] said.

Moore said seeing how well t[he] Japanese students succeed has ma[de] him want to try even harder.

The class gave one student [a] chance to beat the odds of breaki[ng] away from the small school sy[n]drome. Moore said even in a sm[all] school, there is the opportunity [to] learn all that a student wants. "B[e]cause we are a small school we w[ere] able to get more individual attenti[on] from our teachers," he said.

The person that had the great[est] influence on Moore's life was S[on]ny Scott, his math instructor [at] Houlka High. Moore said that Sc[ott] encouraged him to follow [his] dreams. His dream is to becom[e a] secondary math teacher.

Moore said he will remember [the] things his teacher taught him w[hen] he begins his freshman year [at] Northeast Mississippi Commun[ity] College and then on to Mississi[ppi] State University where he plans [to] major in math and compu[ter] science.

Moore, the president of the B[eta] Club during his senior year, spe[nds] a lot of time at church when h[e is] not playing volleyball. He wo[rks] with the youth program at the C[en]ter Hill Baptist Church and [also] sings in the choir.

With one younger brother [and] three younger sisters, Moore s[aid] he hopes he has set a good exam[ple] for his younger siblings. "I try [to] help them out with class work w[hen] they need it. I strive hard in [all] things I do and hope it will m[ake] them strive hard, hard enough [to] say 'I beat my older brother,'" [he] said.

The summer holds uncerta[inty] for Moore while he is in the pro[cess] of looking for a summer job to [help] pay for his college education.

Moore is the son of Mr. and [Mrs.] Albert Lee Moore of Houlka.

Rural students are learning by satellite

Through the use of satellite dishes donated by 4-County EPA, students at three Mississippi schools are receiving courses by satellite in a model project which will enable smaller schools to remain competitive by expanding the advanced classes they are able to offer.

Thanks to the involvement of their electric cooperative, students at three Mississippi schools are now participating in a pilot satellite instruction program which promises to open new horizons for all rural and small town schools in the state.

Ackerman, New Hope and Weir now receive German classes beamed by satellite from Oklahoma State University into their classrooms. Students and teachers are excited about the new instructional medium, and school administrators are optimistic about its potential.

Instruction by satellite may come as a savior to rural schools, where a lack of teachers in certain subject areas has become a real problem. The state Department of Education has granted certification to these classes for one year. At the end of the school year, it will evaluate the programs and decide whether or not they should be allowed to continue and expand.

These satellite learning programs were made possible after Ann Long, member service representative at 4-County Electric Power Association in Columbus, read about Oklahoma State University's satellite courses, which were being offered to rural schools in that state.

In April, 1987, she attended the Learning by Satellite Conference at Oklahoma State University, learned the logistics of the program, and became excited about the great opportunities it could offer to rural Mississippi schools.

Returning home, she wrote a proposal showing how courses could be secured for rural schools, courses that otherwise wouldn't be available. She showed that rural schools could offer more programs without the necessity of a teacher being certified in that course, since the television instructor is certified.

Long convinced 4-County EPA's Board of Directors to donate satellite dishes to the schools for the pilot project because it would benefit children of the entire area. Next she went to the county school superintendents and they went to their boards for approval to buy the programming. They worked together in securing state accreditation and certification.

Ackerman High School and New Hope High School were selected for the pilot project. Weir Attendance Center asked to be included and was also approved.

"Coming from a small town, I saw the advantages some of the kids had over me when I went to college," Long explained. "So now these kids can have the same advantages as the ones from the larger schools.

"The program can also lead to higher A.C.T. scores, advanced placement and staff development for teachers," she said. "It's not just for the college bound, but there's also some adult basic education courses leading to the G.E.D. and other courses, depending upon how much programming the schools want."

Professor Harry Wohlert teaches German by satellite from studios at Oklahoma State University. Twice a week the Mississippi students watch a live broadcast and the other three days they work at computers using programs written by Wohlert.

For each broadcast there's a host school which participates in the class by telephone hookup. Ackerman has already served as the host school and New Hope is scheduled for October 17.

New Hope High School has 10 students in Mrs. Alma Greer's German I class, while 10 students are also enrolled in Dr. Frances Coleman's class at Ackerman High School. Three students are enrolled at Weir Attendance Center, where Dr. Coleman teaches in the afternoon. Weir's class is smaller because it was the last program started.

"Our students are excited about the novelty of the German classes and enjoy the lectures and videos," said Dr. Coleman. "This type of instruction is an answer to the needs of small schools."

After attending the Learning by Satellite Conference at O.S.U. in April, Dr. Rayburn McLeod, principal of Ackerman High School, was impressed with what he saw.

"We think this is going to be an instructional medium of the future," he said. "It will enable small schools to offer subjects to their top students who are going to college that wouldn't otherwise be available."

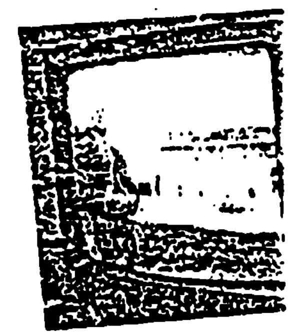
As an example, he explained that small schools often cannot afford to have a teacher certified in Physics or the second year of a foreign language for two or three top students. "Yet these courses are requirements to enter a four-year college," he said.

In evaluating the cost-effectiveness of the German I classes now being taught to students at Ackerman High School, Dr. McLeod said the annual subscription fee was $2,000, plus an additional $4,000 to $5,000 for computers, software and textbooks. "But next year, the only out-of-pocket expense will be the subscription fee, because we already have everything else we need," he said.

"We're looking at being able to offer the course to the top few students who want to go on to college at a cost to the school of around $2,000," he said. "If we had to employ a teacher for two or three people, which is really not economically feasible, it would cost $20,000 to $25,000.

"You can afford to offer your top academic students this medium of opportunity for their courses so they can compete with students from the larger schools which have the courses," he said.

PRINCIPAL MARION KELLEY is shown in front of Weir Attendance C which recently received its satellite dish.



APPENDIX E

Educational Satellite Network's (ESN) Staff Development Programming

ESN STAR SCHOOLS

Definition And Eligibility Criteria For Special Education

December 1, 8, 1988

This two-part program was uplinked live from DESE, and was MSBA/ESN's first official Midland's related program. This program was presented by subject-matter experts recognized in the field of special education. Thee was an interactive question and answer session at the end of each program. More than 89% of Missouri school districts participated in this program.

Reducing the Risk

May 1, 3, 8, 10, 15, 17, 1989

Developed in cooperation with the Missouri Department of Elementary and Secondary Education, ESN presented a 6-part teleconference series focusing on prevention strategies for at-risk students. Program topics included: Reducing the Risk: Reaching the At-Risk Student; Using Community Resources; Setting Up Programs for At-Risk Students; Early Childhood/Parent Education; Parents and School: Partners in Prevention; The School Team: Addressing Student Needs; The Vocational Connection; Cooperative Learning; Curriculum Alignment; Instructional Alternatives; Are Schools Ready for Kids?; A Call to Action (interactive)

Parents as Teachers

May 25, 1989

This teleconference was produced by DESE's Division of Special Education and the Parents as Teachers National Center, in cooperation with ESN. The goal of Parents as Teachers was to work with parents in the home, helping them identify developmental skills and appropriate activities to help their child develop and grow. Two hours of in-service credit were available for parent educators.

Accelerated Schools: Pilot Project

October 17, 24, 1989

This two-part interactive teleconference series provided an overview of the accelerated schools model and a progress report on six pilot projects using the model in Missouri. The program discussed the component concepts of governance, unity of purpose, parent involvement and curriculum.

Star Schools Update

once a month immediately following FOCUS

After MSBA/ESN's monthly FOCUS program, an informative news magazine about educational issues and schedule of events for Missouri Educators, an update on Star Schools programs are presented. This monthly update is broadcast the first Thursday of every month, September through June.

Career Development for the Disadvantaged: Building Alliances for the Future

March 15, 22, 29, 1990

This three-part, interactive teleconference series focused on partnerships between business and education to expand opportunities for disadvantaged students. The goal of the series was to improve communication among public-school and private-sector leaders, and to suggest new ways they could work together to meet the needs of society and the labor market. A Star Schools project produced by ESN in cooperation with the Missouri Department of Elementary and Secondary Education.

Decision '91: Special Education Teleconference

March 21, 1990

This three-hour teleconference defined early childhood intervention and how school districts are becoming involved. Dr. Nancy Peterson, Professor at Kansas university and author of "Early Intervention for Handicapped and At-Risk Children," addressed why services are needed, as well as early-age intervention from a global perspective. Programs and laws which are making an impact were also featured. A Star Schools project produced by ESN and the Missouri Department of Elementary and Secondary Education.

Mastery Learning

May 24, 1990

Research on mastery learning shows it as a dynamic approach for teaching which focuses on the particular abilities of each student. Featured is Dr. Richard King, former coordinator of Curriculum Services with the Missouri Department of Education and a pioneer in implomenting mastery learning in the classroom. The teleconference also features mastery learning as it is being applied in a Missouri classroom, followed by discussion with teachers from the school.

Toward 2000, Citizenship in the Next Century
September 10, 12, 17, 19, 1990
The Missouri Bar Advisory Committee on Citizenship Education's Annual Convention will provide the framework for Citizenship Education, a pretaped series addressing instructional issues associated with citizenship education and government courses of study. The programs will present panel discussions on expectations for learner outcomes in a course of study on citizenship and government, as well as offering creative teaching strategies.

Students at Risk: Prevention and Intervention
October 18, 23, 25, 30, 1990
Prevention and intervention are the focus of the four-part Students at Risk teleconference series which is produced by MSBA/ESN in cooperation with the Department of Elementary and Secondary Education. The teleconference series covers a wide range of issues critically impacting our educational system and its ability to successfully reach students at risk. Educators, community leaders, social service and health professionals, and parents are invited to participate in viewing this program series.

Managing Health and Problems of the Physically Handicapped
February - May, 1990
This fifteen week course for credit was developed by MSBA/ESN in cooperation with the Department of Elementary and Secondary Education for special education teachers. This course was designed to instruct professionals on how to manage the special physical problems and health problems encountered when teaching students with severe handicaps.

APPENDIX F

Missouri School Boards Association (MSBA)/Educational Satellite Network Teleconferences

MSBA/ESN TELECONFERENCES

Public Education: Are We on the Right Track?
October 29, 1988
This national news event provided valuable information concerning important educational issues. As a live, interactive presentation, educators across the nation had an opportunity to discuss such topics as the present condition of education, future Federal policies under the next administration, and the progress we've made since "A Nation at Risk," the report of the National Commission on Excellence in Education which was released in 1983. This presentation was geared toward educational leaders in both higher education and elementary and secondary education, community leaders, state and local officials and the news media.

MSBA Leadership Teleconferences
November 30, 1989
This interactive teleconference was designed for members of the Missouri School Boards Association's 13 Regional Executive Committees. The conference provided information on various Association functions and the duties of committee members. Each committee met and participated in the teleconferences as a group, and planned their regional meetings for the year.

TeachTech 2000
December 7, 1989
An interactive pilot program spotlighting the latest in K-12 educational technology. The program featured ITTE's (Institute for the Transfer of Technology to Education) conference on "Making Schools More Productive." The format included practical technology information for teachers and administrators, interviews with national figures in educational technology as well as an interactive call-in segment.

Avoiding Litigation
March 14, 1990
This interactive teleconference was offered as a specific benefit for districts participating in the MSBA/Forrest T. Jones Errors and Omissions Program. The workshop was designed to help school administrators prevent litigation in the personnel area. The presentation featured a panel discussion followed by a Q&A session. Topics included an analysis of current personnel issues from legal, school administration and insurance perspectives; definitions of E&O coverage areas; and distinctions between E&O and General Liability coverage.

Capitol Connection
January 10, 1990
This live, interactive teleconference gave Missouri students the opportunity to ask state leaders questions about Missouri government and heard first-hand how they are addressing issues which directly affect the life of every Missourian. The program featured Governor John Ashcroft, House Speaker Bob Griffin, and Senate President Pro Tem James Mathewson.

Econ and Me
January 18, 1990
This series of five 15-minute video programs for seven- to ten-year-olds covered basic concepts in economics. A teacher in-service program was aired prior to the series.

ESN Local Coordinator In-service
February 25, 1991
February 15, 1990
September 24, 1990
September 29, 1989
Interactive in-service for ESN local coordinators, giving them an opportunity to meet the ESN staff, see what's new at ESN and hear about grant programs, as well as technical training, including demonstrations on receiving KU-band signals, interactive use of the telephone, and tips on taping.

MSBA Board Candidate Workshop
February 28, 1991
March 1, 1990
February 28, 1989
March 22 , 1988
This in-service workshop produced by MSBA/ESN was an interactive teleconference providing information and hands-on experience to help candidates prepare for the responsibility of being a school board member. Topics included school finance, school law and boardsmanship.

NSBA Convention - New Orleans
April 19-24, 1990
ESN provided videotape coverage of the 1990 NSBA Convention held in New Orleans. Production staff videotaped the major speakers, as well as many of the clinics and other events. Excerpts were sent each day to news media nationwide for use on local television and network newscasts. In addition, ESN transmitted via satellite a news conference with outgoing NSBA President Dr. James Oglesby and a teleconference with NSBA officers.

Changing Channels: Non-Traditional Careers for Women in the '90s
May 10, 1990
An interactive teleconference featuring interviews with women in a variety of non-traditional occupations. The goal of the program is to increase awareness of non-traditional technical careers among female high school students. Produced by Careers Unlimited in cooperation with the Missouri Department of Elementary and Secondary Education's Special Vocational Services and the Education Satellite Network.

FOCUS
First Thursday of each month, September through June
This 30-minute news magazine program is designed for administrators, board members, teachers, support staff and community members. Airing once monthly, "FOCUS" provides an update on current, education-related events through the Missouri School Boards Association and the Missouri Department of Elementary and Secondary Education.

MSBA Delegate Assembly Preview
October 11, 1990
School board members will have the opportunity to preview the proposed resolutions that will be brought before the 1990 MSBA Delegate Assembly. The interactive teleconference will broadcast live from the ESN studio in Columbia. Delegates appointed by school districts will vote on the resolutions during MSBA's Fall Conference on October 27 and 28.

Tools for Teaching and Learning
November 8, 1990
This two-hour videoconference, presented during NSBA's 4th Annual Making Schools More Productive conference at the Dallas INFOMART, will give you the opportunity to explore the full array of technological tools available to today's educators. The instructors will guide you through the fundamentals and show how you can incorporate the latest technological tools into your district's classrooms.

Changing Channels
November 13, 20, 27, 1990
December 4, 11, 1990
These are the first three of a five-part series featuring interviews with women in a variety of non-traditional occupations as well as highlights of those students currently enrolled in a non-traditional course of study. The program provides career awareness material on new and emerging careers in high technology fields. An interactive teleconference will immediately follow each 20 minute video presentation.

Preparing for Employment in the 1990's: The Challenge to Education
November 13, 1990
This teleconference discusses how events taking place around the world effect the future of our communities. It focuses on how Missouri students can acquire the skills and knowledge needed to react and prepare for global competition. Viewers have the opportunity to join other community members in a live, interactive teleconference and pose questions to the speaker through a toll-free telephone line.

Risk Management: Special Education Teleconference
November 29, 1990
This interactive teleconference is being provided by the MSBA/Forest T. Jones Errors and Omissions Insurance Program. It is designed to help avoid litigation and other problems in the administration of special education programs. Case studies will be presented to show where mistakes are commonly made that result in costly litigation.

The 1990 National Student/parent Mock Election
November 1, 1990
As part of the National Student/Parent Mock Election, ESN will present a live, interactive teleconference to announce the results of the Mock Election. The program is designed to give students and their parents the opportunity to vote at their local schools on the same candidates and issues that will appear on the actual General Election ballot a few days later. On November 1, local school district coordinators will be calling in results to the state Mock Election Headquarters at the MSBA offices in Columbia. The results will be tabulated and then relayed to the National Student/parent Mock Election Headquarters in New York. Missouri Secretary of State Roy Blunt will appear on the teleconference.

APPENDIX G

Production Facilities of MSBA's ESN

Production Facilities of The Missouri School Boards Association's Education Satellite Network

The Education Satellite Network (ESN) houses a complete teleconferencing production center, providing high-quality video production of teleconferences and video programs. The production staff share complete expertise in all phases of taking programs from concept development to finished product, incorporating script writing, teleconference/videotaped site setup, videotaped segments of all types, still photography, computer graphics, music, on-camera talent and final production and editing work.

ESN Studio Facility (Columbia, MO and Jefferson City, MO)

ESN's 40' x 30' studio and editing suites, worth in excess of $750,000 and located in Columbia with a partner studio located at the Missouri Department of Elementary and Secondary Education in Jefferson City, provide A/B roll editing capabilities on 3/4" SP format videotape. CEL Electronics digital video effects allow state-of-the-art manipulation of the video image. A total computer graphics environment, including 3-D modeling and animation, titling and business graphics, is available for high-quality images. The studios themselves offer pleasant, functional, broadcast-quality environments for teleconferences or taping.

A/B Roll Edit Suite Equipment:

- 1 BVE-900 Sony Edit Controller
- 2 BVU-900 Sony 3/4" SP Videocassette Player
- 1 BVU-950 Sony 3/4" SP Videocassette Recorder
- 1 SEG-2550A Sony Switcher
- 2 CEL TBCs with Digital Effects Controller
- 1 MXP-29 8-channel Sony Audio Mixer
- 1 Tascam 112 Audio Cassette Deck
- 1 Sony CD Compact Player
- 1 Beta BCB 60 Playback
- RTS Multiple Station Intercom System
- 1 Graphics Computer
    - 3-D Rendering
    - Video Capture
    - Title Generator

ESN Mobile C-Band Uplink Truck

The Education Satellite Network offers you **FULLY REDUNDANT** mobile C-Band transmission capability. Based in Central Missouri, our broadcast quality transportable can travel to your sporting event, teleconference or news story. Used with a mobile or fixed production facility, you can uplink programming from virtually anywhere in the continental United States.

One of the best C-Band transportables on the road today, our unity, built by RF Scientific, is a unique 32 foot single bed vehicle with a 2 degree compliant 5.5 meter Comtech offsat antenna. It is more maneuverable than most C-band units and can uplink from more locations for you.

ESN C-Band Transportable Includes:

Dual MCL 3.35 KW HPAs
Dual Harris 8015 Upconverters
3 port feed (1 up/2 down)
Cellular Phone
Sony 9850 SP Tape Playback

Related Satellite Transmission Services:

Provide KU and C-band Satellite Space Segment
Arrange for Turnaround Services
Studio and Mobile Production Facilities

ESN Mobile Production Van

Designed for on-location videography, ESN's mobile production van allows three cameras with switching capability on location. The $150,000 van has full editing capability in the 3/4" SP videotape format, a Quanta character generator for titling, and a Tascam audio system. It is a complete control room on wheels. Coupled with the C-band uplink truck, it forms a complete mobile production and broadcast facility.

Production Van Specifications:

3 person crew
3 DXC-M7 Sony Cameras, Canon lenses (15:1), 330 ft. cables, CCU's
2 ITE tripods, H50E heads
1 SEG 2000A Sony Switcher
1 MXP 21 Sony 8 Channel Audio Mixer
1 BVU-900 Sony 3/4" SP Videocassette Player with TBC (BVR-55)
1 RM-450 Sony Edit Controller
1 Quanta QCG-400 Title Generator
1 Honda on Board Generator
5 Videotek Monitors:
  1 VM-13 Pro (PGM/PST)
  2 VM-8PRD 8" monitors (cameras)
  1 VM-8PRW (character generator)
  1 VM-8PRA (VTR1/VTR2)
1 TVM-620 Combination Waveform Monitor/Vectorscope
1 Tascam 112 Audio Cassette Deck
2 JBL Control 1 speakers
1 Gentner Digital Hybrid Telephone System (Phone Bridger)
2 HMF System 50 Body-Pac Wireless Microphones (Lavs)
2 Electro-Voice RE50 Dynamic Omnidirectional Microphones
1 Portable Teleprompter
2 Light Kits--2 Broads (650W), 4 Spots (1000W)
RTS Multiple-Station Intercom System

For more information, contact:

Education Satellite Network
Frank Finley, ESN Production Manager
Terri Baur, Director, Business Operations
2100 I-70 Drive, S.W.
Columbia, Missouri 65203

APPENDIX H

ESN Missouri Member Sites

District	Site
Adair Co. R-I	Adair High School
Adrian R-III	Adrian Senior High
Advance R-IV	Advance High School
Alton R-IV	Alton High School
Appleton City R-II	Appleton City Senior
Arcadia Valley R-2	Arcadia Valley High
Arcadia Valley R-2	Arcadia Valley Elemen
Ash Grove R-4	Bois D'Arc Elementary
Aurora R-8	Aurora High School
Bakersfield R-IV	Bakersfield High Scho
Ballard R-II	Ballard Senior High
Bell City R-II	Bell City High School
Bell City R-II	Bell City Elementary
Billings R-IV	Billings High School
Bismarck R-V	Bismarck High School
Blue Eye R-V	Blue Eye High School
Bolivar R-I	Bolivar Senior High
Bolivar R-I	Bolivar Middle School
Boone County R-IV	Boone County High Sch
Braymer C-4	Braymer High School
Brookfield R-III	Brookfield High Schoo
Butler R-V	Bulter High School
Cainsville R-I	Cainsville High Schoo
Callaway Co. R-III	Callaway Co. High Sch
Camden Co. R-II	Camden High School
Camdenton R-III	Camdenton Junior High
Cameron R-I	Cameron High School
Cameron R-I	Parkview Elementary
Campbell R-II	Campbell Senior High
Canton R-V	Canton Senior High
Carl Junction R-I	Carl Junction High Sc
Carl Junction R-I	Carl Junction Jr. Hig
Carl Junction R-I	Elementary-Primary
Carl Junction R-I	Carl Junction Inter.
Carthage R-9	Carthage Senior High
Caruthersville 18	Caruthersville Sen. H
Cass R-V	Archie Senior High
Cassville R-4	Cassville Senior High
Center No. 58	Center High School
Central R-III	Central High School
Chaffee R-II	Chaffee High School
Charleston R-I	Charleston Senior Hig
Charleston R-I	Charleston Junior Hig
Charleston R-I	Kindergarten
Charleston R-I	Warren Hearnes Elem.
Chillicothe R-II	Chillicothe High Scho
Chillicothe R-II	Chillicothe Junior Hi
Chrysler Assembly Plant	St. Louis Assembly II
Clark County R-I	Clark Co. R-I High Sc
Clearwater R-I	Clearwater R-I
Climax Springs R-IV	Climax Springs High

District	Site
Clinton	Clinton Annex
Cole Camp R-I	Cole Camp High School
Cole County R-V	Cole County R-V
Columbia 93	Instructional Media S
Cooper County C-4	Cooper County Senior
Cooter R-IV	Cooter High School
Crawford County R-I	Bourbon High School
Crawford County R-II	Cuba Elementary
Crystal City No. 47	Crystal City High Sch
DESE	Telecommunications Sv
Dadeville R-II	Dadeville Senior High
Davis R-12	Davis Elementary
Delta R-V	Delta High School
Dent Phelps R-III	Dent Phelps Elementar
Dexter R-XI	Dexter Senior High Sc
Dexter R-XI	T.S. Hill Middle Scho
Dora R-III	Dora High School
East Buchanan C-1	East Buchanan Senior
East Buchanan C-1	Easton Middle School
East Buchanan C-1	East Buchanan Element
East Carter R-II	East Carter High Scho
East Prairie	A.J.Martin Elementary
East Prairie R-II	East Prairie High Sch
El Dorado Springs R-II	El Dorado Springs Hig
El Dorado Springs R-II	South Elementary Scho
Eldon R-I	Administrative Unit
Eldon R-I	Eldon High School
Eldon R-I	Eldon Junior High
Elsberry R-II School	Elsberry High School
Excelsior Springs 40	West High School
Fair Grove R-X	Fair Grove High Schoo
Fairfax R-III	Fairfax High School
Fairview R-XI	Fairview Elementary
Farmington R-VII	Farmington Senior Hig
Fayette R-III	Laurence J. Daly Elem
Ferguson-Florissant	Administration Buildi
Festus R-VI	Festus Senior High
Festus R-VI	Festus Middle School
Festus R-VI	Festus Elementary Sch
Fort Osage R-I	Fort Osage Senior Hig
Fort Zumwalt	Ft. Zumwalt North Hig
Fort Zumwalt	South High School
Fox C-6	Administration Buildi
Franklin Co. R-16	Strain-Japan Elementa
Franklin Co. R-II	Franklin High School
Fulton 58	Fulton #58 High Schoo
Fulton 58	Fulton #58/Bush Elem.
Gainesville R-V	Gainesville High Scho
Galena R-II	Galena High School
Gallatin R-V	Gallatin High School
Gasconade Co. R-I	Hermann High School
Gideon No. 37	Gideon High School

District	Site
Gilman City R-IV	Gilman City High Scho
Glenwood R-VIII	Glenwood Elementary
Golden City R-III	Golden City Elementar
Grain Valley R-5	Grain Valley R-5
Green City R-I	Green City High Schoo
Green Ridge R-VIII	Green Ridge Elementar
Greenfield R-IV	Greenfield High Schoo
Greenville R-II	Greenville High Schoo
Grundy Co. R-IX	Grundy Senior High
Grundy Co. R-V	Grundy High School
Grundy Co. R-V	Grundy Elementary
Hamilton R-II	Penney High School
Hardin-Central C-2	Hardin-Central H.S.
Harrisburg R-VIII	Harrisburg High Schoo
Harrisonville Cass R-IX	Harrisonville H.S.
Harrisonville Cass R-IX	Harrisonville Tech. S
Harrisonville Cass R-IX	Harrisonville Element
Harrisonville Cass R-IX	McEowen Elementary
Hartville R-2	Grovespring Elementar
Hartville R-2	Hartville Elementary
Hayti R-II	Hayti High School
Hayti R-II	Mathis Elementary
Hazelwood	Central High School
Hermitage District R-IV	Hermitage Senior High
Hickory Co. R-I	Skyline High School
Higbee R-VIII	Higbee Senior High
Hillsboro R-III	Hillsboro Senior High
Hillsboro R-III	Hillsboro Junior High
Holden R-III	Holden Senior High
Holden R-III	South Elementary Scho
Hollister R-V	Hollister Senior High
Howell Valley R-I	Howell Valley Element
Humansville R-4	Humansville Senior Hi
Iberia R-V	Iberia High School
Jackson R-II	Jackson Senior High
Jameson R-III	Jameson High School
Jameson R-III	North Daviess Element
Jefferson C-123	Jefferson Senior High
Jefferson City	Jefferson City High
Johnson County R-VII	Johnson Co. High Scho
Joplin R-VIII	Administrative Center
Joplin R-VIII	Joplin High School
Joplin R-VIII	Joplin Junior High
Junction Hill C-12	Junction Hill Element
Kansas City 33	Administrative Office
Kansas City 33	Lincoln Col. Prep Aca
Kearney R-I	Kearney High School
Kearney R-I	Kearney Jr. High
Kearney R-I	Holt Elementary
Kearney R-I	Kearney Elementary
Kennett No. 39	Kennett Senior High
Kennett No. 39	H. Byron Masterson El

District	Site
Kingsville R-I	Kingsville Jr.-Sr. Hi
Kirksville R-III	Kirksville Junior Hig
Knob Noster R-VIII	Knob Noster High Scho
Knob Noster R-VIII	Knob Noster Middle Sc
Knox Co. R-I	Knox Co. Senior High
La Monte R-IV	La Monte High School
La Plata R-II	La Plata High School
Laclede Co. C-5	Joel E. Barber Elemen
Laclede Co. R-I	Conway High School
Lafayette County C-1	Lafayette High School
Lamar R-I	Lamar High School
Laquey R-V	Laquey High School
Lathrop R-II	Lathrop R-II High Sch
Lathrop R-II	Lathrop Elementary
Lee's Summit R-VII	Administration Buildi
Leeton R-X	Leeton R-X High Schoo
Lesterville R-IV	Lesterville Senior Hi
Lesterville R-IV	Lesterville Elementar
Lewis County C-1	Highland Senior High
Lexington R-V	Lexington High School
Liberal R-II	Liberal High School
Liberty No. 53	Liberty Senior High
Lone Jack C-6	Lone Jack High School
Lone Jack C-6	Lone Jack Elementary
Louisiana R-II	Louisiana Primary Sch
MO Western State Collegey	MO Western State Coll
Macon Co. R-IV	Macon High School
Macon County R-I	Macon County Senior H
Madison C-3	Madison High School
Malden R-I	Malden High School
Mansfield R-4	Wilder Elementary Sch
Marceline R-V	Marceline High School
Marceline R-V	Walt Disney Elementar
Maries Co. R-I	Maries Co. High Schoo
Maries Co. R-II	Maries Co. High Schoo
Marion County R-II	Marion High School
Marionville R-IX	Marionville Senior Hi
Marquand R-VI	Marquand High School
Marshall	Marshall Senior High
Marshall	Bueker Middle School
Marshfield R-I	Marshfield Senior Hig
Marshfield R-I	Marshfield Junior Hig
Marshfield R-I	Upper Elementary
Maryville R-II	NWMO Area Vo-Tech Sch
Maryville R-II	Maryville High School
Maryville R-II	Washington Middle Sch
Maryville R-II	Eugene Field Elementa
Maysville R-I	Maysville High School
McDonald County R-I	McDonald Senior High
Meadow Heights R-II	Meadow Heights High
Meadville R-IV	Meadville Elementary
Miami R-	Miami R-I Sen. High

District	Site
Mid Buchanan Co. R-V	Mid Buchanan Jr/Sr Hi
Midway R-I	Midway R-I High Sch.
Miller County R-III	Miller County R-III
Miller Sch. Dist. R-II	Miller High School
Mineral Area College	Mineral Area College
Moberly	Moberly
Monett R-I	Monett Middle School
Monett R-I	Monett High School
Moniteau Co. R-I	Moniteau Co. High Sch
Moniteau Co. R-VI	Syracuse Elementary
Moniteau Co. R-VI	Tipton Elementary
Monroe City R-I	Monroe City R-I
Montgomery Co. R-II	Montgomery High Schoo
Morgan County R-I	Morgan County High Sc
N.E. Randolph Co. R-IV	N.E. Randolph High Sc
Neelyville R-4	Neelyville High Schoo
Neosho R-5	Neosho High School
Nevada R-5	Nevada High School
Nevada R-5	Nevada Area Voc. Scho
Nevada R-5	Nevada Middle School
New Haven #138	New Haven High School
New Haven #138	New Haven Elementary
New Madrid Co. R-I	New Madrid Central Hi
Niangua R-5	Niangua High School
Nodaway-Holt R-VII	Nodaway Holt High Sch
North Andrew Co. R-VI	North Andrew Senior H
North Harrison R-III	North Harrison High
North Kansas City 74	NKC 74, Ctr. Educ. De
North Mercer R-III	North Mercer Senior H
North Nodaway Co. R-VI	North Nodaway R-VI
North Pemiscot	N. Pemiscot Senior Hi
North Platte R-I	North Platte High Sch
North Platte R-I	Camden Point Elementa
North St Francois Co. R-I	No. St. Francois High
North St Francois Co. R-I	North County Junior H
Northeast MO State Univ.	Northeast MO State Un
Northeast Nodaway Co. R-V	N.E. Nodaway Senior H
Northwest R-1	Northwest High School
Northwest R-1	North Jefferson Middl
Northwest R-1	Cedar Hill Middle
Northwest R-1	House Springs Middle
Oak Grove R-VI	Oak Grove High School
Oak Grove R-VI	Oak Grove Elementary
Oak Ridge R-6	Oak Ridge High School
Odessa R-7	Odessa Senior High
Odessa R-7	Mary McQuerry Element
Oran R-III	Oran High School
Orrick R-XI	Orrick High School
Osage Co. R-III	Fatima High School
Osborn R-0	Osborn High School
Otterville R-VI	Otterville High Schoo
Owensville R-2	Owensville High Schoo

District	Site
Ozark R-6	Ozark High School
Palmyra H.S. R-I	Palmyra High School
Palmyra H.S. R-I	Palmyra Jr. High Scho
Parkway	Instr. Services Cente
Parkway	Instructional Service
Pattonville R-III	Pattonville Senior Hi
Pemiscot Co. R-III	Unit One Elementary
Pemiscot Co. Special	Oakview Learning Ctr.
Pemiscot County C-7	Delta High School
Perry Co. 32	Perry Co. Senior High
Platte County R-III	Platte County Senior
Platte County R-III	Barry Middle School
Pleasant Hill R-III	Pleasant Hill High Sc
Pleasant Hope R-VI	Good Samaritan Boys C
Pleasant Hope R-VI	Pleasant Hope High Sc
Polo R-VII	Polo High School
Poplar Bluff R-I	Poplar Bluff Senior H
Portageville	Portageville High Sch
Potosi R-3	Potosi High School
Potosi R-3	John Evans Middle Sch
Potosi R-3	Potosi Elementary
Princeton R-V	Princeton Jr.-Sen. Hi
Pulaski Co. R-II	Pulaski Co. High Scho
Purdy R-II	Purdy High School
Putnam County R-I	Putnam High School
Puxico R-VIII	Puxico High School
Raymore-Peculiar R-II	Raymore-Peculiar Jr.
Raytown C-2	Raytown Media Center
Republic R-III	Republic High School
Revere C-3	Revere Senior High
Richards R-5	Richards Elementary
Richland R-I	Richland Senior High
Richmond R-XVI	Richmond High School
Richwoods R-VII	Richwoods Elementary
Ridgeway R-V	Ridgeway High School
Rolla 31	Rolla Senior High
S.E. Missouri State	S.E. Missouri State
Sarcoxie R-2	Sarcoxie High School
School of Osage R-II	Osage Middle School
Schuyler R-I	Schuyler Co. Elementa
Scott City R-I	Scott City High Schoo
Scott Co. R-IV	Thomas Kelly High Sch
Scott Co. R-V	Scott Central High
Sedalia 200	Smith Cotton High Sch
Sedalia 200	Sedalia Middle School
Shawnee R-3	Shawnee Elementary
Shelby County C-I	North Shelby High
Shelby County R-IV	South Shelby High Sch
Sherwood Cass R-VIII	Sherwood High School
Sikeston R-VI	Sikeston Senior High
Smithton R-VI	Smithton High School
South Callaway Co. R-2	South Callaway High

District	Site
South Harrison R-II	South Harrison High
South Harrison R-II	Bethany Elementary
South Holt R-1	South Holt Senior Hig
South Iron R-1	South Iron High Schoo
South Pemiscot R-V	South Pemiscot High S
Southern Reynolds R-II	So. Reynolds Senior H
Southland C-9	Southland High School
Southwest Barry Co. R-V	Southwest Elementary
Southwest Livingston R-I	Southwest Livingston
Sparta R-III	Sparta High School
Spokane R-VII	Spokane High School
Springfield	General Service Cente
Springfield	KAC/Central High Scho
Springfield	Glendale Senior High
Springfield	Hillcrest Senior High
Springfield	Kickapoo Senior High
Springfield	Parkview Senior High
Springfield	Graff Vo-Tech Center
Springfield	Hickory Hills Junior
Springfield	Jarrett Jr. High Scho
Springfield	Cherokee Junior High
Springfield	Pleasant View Jr. Hig
Springfield	Reed Junior High
Springfield	Pershing Elementary
Springfield	Study Elementary
St. Elizabeth R-IV	St. Elizabeth Senior
St. Francis Borgia	St. Francis Borgia Hi
St. James R-I	St. James High School
St. Joseph	Troester Media Center
St. Joseph	Benton Senior High
St. Joseph	Central Senior High
St. Joseph	Lafayette Senior High
St. Louis City	Div. Curr. & Staff De
St. Louis City	Cleveland NJROTC Acad
St. Louis City	Northwest High School
Ste. Genevieve R-2	Ste. Genevieve Sen. H
Ste. Genevieve R-2	Bloomsdale Elementary
Steelville R-3	Steelville Upper Elem
Stet R-XV	Stet Senior High
Stewartsville C-II	Stewartsville High Sc
Stockton R-I	Stockton High School
Strafford R-VI	Strafford High School
Sullivan C-2	Sullivan High School
Sullivan C-2	Sullivan Middle Schoo
Thayer R-2	Thayer Jun.-Sen. High
Three Rivers Com. College	Three Rivers Com. Col
Tina-Avalon R-2	Tina-Avalon R-2 H.S.
Tri-County R-7	Tri-County High Schoo
Twin Rivers R-10	Twin Rivers High Scho
University of Missouri	Academic Support Cent
Van Buren R-I	Van Buren Senior High
Van Buren R-I	Van Buren Elementary

District	Site
Verona R-7	Verona High School
Walnut Grove R-V	Walnut Grove High Sch
Warren County R-III	Warren Junior High
Warren County R-III	Warren Co. High Schoo
Warren County R-III	Daniel Boone Elementa
Warren County R-III	Rebecca Boone Element
Warrensburg R-VI	Warrensburg High Scho
Waynesville R-VI	Educational Media Cen
Weaubleau R-III	Weaubleau High School
Webb City R-VII	Webb City High School
Wellington Napoleon R-9	Wellington Napoleon R
Wellston Sch. Dist.	M.R. Eskridge Memoria
Wellston Sch. Dist.	Central Elementary
West Plains R-7	West Plains Senior Hi
West Plains R-7	West Plains Middle Sc
West Platte R-II	West Platte High Scho
West St. Francois R-IV	West County High Scho
West St. Francois R-IV	West County Elementar
Westran R-I	Westran Senior High
Westran R-I	Westran Middle School
Westview School C-6	Westview Elementary
Wheatland R-II	Wheatland R-II
Wheaton R-III	Wheaton Senior High
Willard R-2	Willard High School
Willard R-2	Willard Jr. High Scho
Windsor Con. Dist. #1	Windsor High School
Windsor Con. Dist. #1	Windsor Elementary

Total sites: 390

APPENDIX I

Oklahoma Star Schools

OKLAHOMA STAR SCHOOLS PROJECT

SUMMARY OF INFORMATION ON SCHOOLS WHICH RECEIVED DOWNLINK GRANTS IN SUMMER, 1989

Apache Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 181 students in grades K-12.
Equipment will serve 46 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	29%
Receive free or reduced price lunches:	53%
Are handicapped:	14%
Are racial or ethnic minority:	40%
For whom English is a second language:	Less than 1%
Drop-out rate:	Not available

Satellite programming received to date:
Student Course: German I from OSU (live) -- 16 students

Ardmore City Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 894 students in grades 9-12.
Equipment will serve 68 teachers, administrators, and support personnel in grades 9-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	63%
Receive free or reduced price lunches:	36%
Are handicapped:	10%
Are racial or ethnic minority:	35%
For whom English is a second language:	1%
Drop-out rate:	25%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 17 students

Bell Elementary School

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 164 students in pre-school through grade 8.
Equipment will serve 23 teachers, administrators, and support personnel in pre-school through grade 8.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	20%

Receive free or reduced price lunches: 87%
Are handicapped: --
Are racial or ethnic minority: 98% (Native American)
For whom English is a second language: 92%
Drop-out rate: 3-4%.

Satellite programming received to date:
Student Course: Basic English and Reading from OSU (live) -- 1 student

Cashion Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 126 students in grades 9-12.
Equipment will serve 36 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: 7%
Receive free or reduced price lunches: 7%
Are handicapped: 9%
Are racial or ethnic minority: 0%
For whom English is a second language: 0%
Drop-out rate: 1%

Satellite programming received to date:
Student Course: Russian from OSU (live) -- 6 students
Student Course: Basic English and Reading from OSU (live) -- 5 students

Chickasha Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 959 students in grades 8-12.
Equipment will serve 97 teachers, administrators, and support personnel in grades 8-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: 41%
Receive free or reduced price lunches: 30%
Are handicapped: 4%
Are racial or ethnic minority: 19%
For whom English is a second language: 0%
Drop-out rate: 5%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 24 students
Student Course: Economics from OSU (live) -- 38 students
Student Course: AP American Government from OSU (live) -- course does not begin until January, 1990

Comanche Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 277 students in grades 9-12 (service will eventually be expanded to serve all grades).
Equipment will serve 34 teachers, administrators, and support personnel in grades 9-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	39%
Receive free or reduced price lunches:	49%
Are handicapped:	2%
Are racial or ethnic minority:	5%
For whom English is a second language:	.1%
Drop-out rate:	5%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 10 students
Student Course: AP Chemistry from OSU (live) -- 16 students
Staff Development Program: CD ROM Teleconference from the College of DuPage; one-time-only (live) -- 8 teachers
Student Non-Courses: All of the following programs were viewed on tape --
Tale of Two Cities, 4 weekly programs from PBS, 23 viewers
Discover Program #1, one-time-only (OTO) from PBS, 20 viewers
Discover Program #2, OTO from PBS, 20 viewers
1963 Kennedy-Johnson Transition, OTO from C-SPAN, 21 viewers
Electoral College, OTO, C-SPAN, 21 viewers
National Archives, OTO, C-SPAN, 20 viewers
Assignment Discovery, OTO, Discovery Channel, 19 viewers
Beyond 2000, OTO, Discovery Channel, 20 viewers
The New Literacy: An Introduction to Computers, OTO, The Learning Channel, 9 viewers
Martin Luther King March on Washington, OTO, C-SPAN, 17 viewers
Congress Hall, OTO, C-SPAN, 16 viewers
Smithsonian Journalism, OTO, C-SPAN, 14 viewers

Covington-Douglas Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 308 students in grades K-12.
Equipment will serve 30 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	21%
Receive free or reduced price lunches:	17%
Are handicapped:	0%
Are racial or ethnic minority:	1%
For whom English is a second language:	0%
Drop-out rate:	3%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 15 students
Community Program: Agricultural Education (one-time-only from VoTech/OSU; live) -- 4 viewers
Community Program: CD ROM (one-time-only from College of DuPage; live and tape) -- 1 viewer (live); 1 viewer (tape)

Deer Creek-Lamont Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 201 students in grades K-12.
Equipment will serve 35 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	10%
Receive free or reduced price lunches:	25%
Are handicapped:	10%
Are racial or ethnic minority:	0%
For whom English is a second language:	0%
Drop-out rate:	0%

Satellite programming received to date:
Student Course: Basic English and Reading from OSU (live) -- 3 students

Dewar High School

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 44 students in grades 11-12.
Equipment will serve 26 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	32%
Receive free or reduced price lunches:	48%
Are handicapped:	0%
Are racial or ethnic minority:	26%
For whom English is a second language:	0%
Drop-out rate:	1%

Satellite programming received to date:
Student Course: Trig/AnalGeom from OSU (live) -- 6 students

Elgin Middle Public School

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 220 students in grades 6-8.
Equipment will serve 24 teachers, administrators, and support personnel in grades 6-8.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	13%
Receive free or reduced price lunches:	33%

Are handicapped:	Less than 1%
Are racial or ethnic minority:	19%
For whom English is a second language:	1%
Drop-out rate:	2%

Satellite programming received to date:
- Student Course: Basic English and Reading from OSU (taped) -- 10 students
- Student Non-Course: NASA's "Voyage to Neptune" (taped) -- 56 students
- Student Non-Course: ABC's coverage of President Bush's drug address (live) -- 46 students
- Student Non-Course: CBS' coverage of Hurricane Hugo (live) -- 26 students

Erick Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 75 students in grades 10-12.
Equipment will serve 14 teachers, administrators, and support personnel in grades 10-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	11%
Receive free or reduced price lunches:	40%
Are handicapped:	1%
Are racial or ethnic minority:	10%
For whom English is a second language:	0%
Drop-out rate:	1%

Satellite programming received to date:
- Student Course: Spanish I from KSU (live) -- 11 students

Fairfax Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 401 students in grades K-12.
Equipment will serve teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	43%
Receive free or reduced price lunches:	52%
Are handicapped:	56%
Are racial or ethnic minority:	42%
For whom English is a second language:	0%
Drop-out rate:	0%

Satellite programming received to date:
- Student Course: German I from OSU (live) -- 10 students

Felt Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 79 students in grades K-12.
Equipment will serve 13 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	8%
Receive free or reduced price lunches:	38%
Are handicapped:	1%
Are racial or ethnic minority:	6%
For whom English is a second language:	6%
Drop-out rate:	0%

Satellite programming received to date:
- Student Non-Course: Weekly Science Program on the Discovery Channel (live) -- 12 students
- Student Non-Course: Weekly Programs on The Learning Channel (taped) -- 12 students
- Student Non-Course: Weekly Home Economics Program on The Learning Channel (taped) -- 10 students
- Staff Development: Viewing of Midlands Consortium Equipment Operations Tape (taped) -- 2 persons

Hilldale Public Schools

Suburban school; qualifies for Chapter 1 assistance.
Equipment will serve 740 students in grades preschool-5.
Equipment will serve 68 teachers, administrators, and support personnel in grades K-6.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	8%
Receive free or reduced price lunches:	16%
Are handicapped:	24%
Are racial or ethnic minority:	5%
For whom English is a second language:	0%
Drop-out rate:	NA%

Satellite programming received to date:
Because of its length, the programming log from Hilldale is attached at the end of this report.

Hobart Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 423 students in grades 6-12.
Equipment will serve 40 teachers, administrators, and support personnel in grades 4-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	11%
Receive free or reduced price lunches:	49%
Are handicapped:	4%

Are racial or ethnic minority: 33%
For whom English is a second language: Less than 1%
Drop-out rate: 2%

Satellite programming received to date:
Student Course: Basic English and Reading from OSU (live) -- 15 students
Student Non-Course: PSAT/NMSQT Preparation By Satellite (7 programs) (taped) -- 50 students
Student Non-Course/Community Program: Modernizing Agriculture Education in Oklahoma -- one-time-only broadcast (live and taped) -- 4 viewers live and 25 viewers on tape

Inola Public Schools

Suburban school; qualifies for Chapter 1 assistance.
Equipment will serve 621 students in grades 1-8.
Equipment will serve 101 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: 3%
Receive free or reduced price lunches: 18%
Are handicapped: 1%
Are racial or ethnic minority: 1%
For whom English is a second language: 0%
Drop-out rate: 1%

Satellite programming received to date:
Student Course: Basic English and Reading from OSU (live) -- 11 students

Jenks Public Schools

Suburban school; qualifies for Chapter 1 assistance.
Equipment will serve 2,026 students in grades 9-12.
Equipment will serve 125 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: 4%
Receive free or reduced price lunches: 7%
Are handicapped: 10% (IEP)
Are racial or ethnic minority: 6%
For whom English is a second language: 1%
Drop-out rate: 2%

Satellite programming received to date:
Student Course: Russian from OSU (live) -- 17 students
Student Course: AP Calculus from OSU (live) -- 28 students

Jones Public Schools

Rural/suburban school; qualifies for Chapter 1 assistance.
Equipment will serve 535 students in grades 7-12.
Equipment will serve 70 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	20%
Receive free or reduced price lunches:	32%
Are handicapped:	1%
Are racial or ethnic minority:	2%
For whom English is a second language:	2%
Drop-out rate:	5%

Satellite programming received to date:
Student Course: Basic English and Reading from OSU (live) -- 15 students
Student Course: Russian from OSU (live) -- 15 students

Lawton Public Schools

Urban school; qualifies for Chapter 1 assistance.
Equipment will serve 17,699 students in grades K-12.
Equipment will serve 2,218 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	9%
Receive free or reduced price lunches:	39%
Are handicapped:	11%
Are racial or ethnic minority:	38%
For whom English is a second language:	.5%
Drop-out rate:	21%

Satellite programming received to date:
Programming report not yet received.

Liberty (Mounds) Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 172 students in grades 9-12.
Equipment will serve 61 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	17%
Receive free or reduced price lunches:	38%
Are handicapped:	3%
Are racial or ethnic minority:	27%
For whom English is a second language:	0%
Drop-out rate:	1%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 10 students

Lone Wolf Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 112 students in grades K-6.
Equipment will serve 10 teachers, administrators, and support personnel in grades K-6.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	26%
Receive free or reduced price lunches:	51%
Are handicapped:	2%
Are racial or ethnic minority:	5%
For whom English is a second language:	1%
Drop-out rate:	2%

Satellite programming received to date:
- Student Course: German I from OSU (live) -- 18 students
- Student Course: German II from OSU (live) -- 5 students

Miami Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 2,340 students in grades K-12.
Equipment will serve 272 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	24%
Receive free or reduced price lunches:	42%
Are handicapped:	10%
Are racial or ethnic minority:	36%
For whom English is a second language:	0%
Drop-out rate:	3%

Satellite programming received to date:
- Staff Development: Students At Risk, one-time-only (tape) -- number of viewers not indicated
- Student Non-Course: Art History, weekly for 10 weeks from PBS (tape) -- 20 students
- Student Non-Course: Visions, weekly for 12 weeks from PBS (tape) -- 20 students
- Student Non-Course: Acme School of Stuff, weekly for 13 weeks from PBS (tape) -- 30 students

Minco Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 250 students in grades 5-12.
Equipment will serve 45 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	5%

Receive free or reduced price lunches: 19%
Are handicapped: 0%
Are racial or ethnic minority: 1%
For whom English is a second language: 0%
Drop-out rate: 3%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 9 students
Student Non-Course: "Flight Testing" from NASA (live) -- 1 student; (taped) 30 students

Oklahoma City, Douglass High School*

Urban school; qualifies for Chapter 1 assistance.
Equipment will serve 910 students in grades 9-12.
Equipment will serve teachers, administrators, and support personnel in grades 9-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: Not available
Receive free or reduced price lunches: Not available
Are handicapped: Not available
Are racial or ethnic minority: 68% (at high school)
For whom English is a second language: Not available
Drop-out rate: Not available

Satellite programming received to date:
Student Course: AP Calculus from OSU (live) -- 6 students

Oklahoma City, Star Spencer High School*

Urban school; qualifies for Chapter 1 assistance.
Equipment will serve 776 students in grades 9-12.
Equipment will serve teachers, administrators, and support personnel in grades 9-12.
Estimate of percent of students in the district who:
Receive Chapter 1 services: Not available
Receive free or reduced price lunches: Not available
Are handicapped: Not available
Are racial or ethnic minority: 83% (high school)
For whom English is a second language: Not available
Drop-out rate: Not available

Satellite programming received to date:
Student Course: AP Chemistry from OSU (live) -- 6 students
Student Course: Trig/AnalGeom from OSU (live) -- 13 students

Pond Creek-Hunter Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 90 students in grades 9-12.
Equipment will serve 27 teachers, administrators, and support

personnel in grades K-12.
Estimate of percent of students in the district who:
- Receive Chapter 1 services: 15%
- Receive free or reduced price lunches: 20%
- Are handicapped: 0%
- Are racial or ethnic minority: 0%
- For whom English is a second language: 0%
- Drop-out rate: 0%

Satellite programming received to date:
Student Course: German I from OSU (taped) -- 15 students

Soper Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 91 students in grades 9-12.
Equipment will serve teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:
- Receive Chapter 1 services: 9%
- Receive free or reduced price lunches: 57%
- Are handicapped: 1%
- Are racial or ethnic minority: 27%
- For whom English is a second language: 0%
- Drop-out rate: 1%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 13 students
Community Non-Course: Modernization of Agriculture Education (OSU -- live -- one-time-only, 12/13/89) -- 12 viewers

Sulphur Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 370 students in grades 9-12.
Equipment will serve 33 teachers, administrators, and support personnel in grades 7-12.
Estimate of percent of students in the district who:
- Receive Chapter 1 services: 12%
- Receive free or reduced price lunches: 32%
- Are handicapped: 12%
- Are racial or ethnic minority: 2%
- For whom English is a second language: Less than 1%
- Drop-out rate: 4%

Satellite programming received to date:
Student Course: AP Physics from OSU (live) -- 12 students

Varnum Public Schools

Rural school; qualifies for Chapter 1 assistance.

Equipment will serve 31 students in grades 11-12.
Equipment will serve 32 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	15%
Receive free or reduced price lunches:	50%
Are handicapped:	0%
Are racial or ethnic minority:	20%
For whom English is a second language:	1%
Drop-out rate:	0%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 9 students

Verden Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 276 students in grades K-12.
Equipment will serve 44 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	7%
Receive free or reduced price lunches:	30%
Are handicapped:	7%
Are racial or ethnic minority:	12%
For whom English is a second language:	0%
Drop-out rate:	Less than 1%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 5 students

Wagoner Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 562 students in grades 9-12.
Equipment will serve 77 teachers, administrators, and support personnel in grades 7-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	12%
Receive free or reduced price lunches:	42%
Are handicapped:	13%
Are racial or ethnic minority:	42%
For whom English is a second language:	0%
Drop-out rate:	1%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 16 students
Student Course: Russian from OSU (live) -- 8 students

Waukomis Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 105 students in grades 10-12.
Equipment will serve 56 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	7%
Receive free or reduced price lunches:	35%
Are handicapped:	21%
Are racial or ethnic minority:	1%
For whom English is a second language:	0%
Drop-out rate:	.5%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 9 students
Student Course: AP Physics from OSU (live) -- 5 students

Wellston Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 625 students in grades K-12.
Equipment will serve 60 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	7%
Receive free or reduced price lunches:	33%
Are handicapped:	5%
Are racial or ethnic minority:	7%
For whom English is a second language:	0%
Drop-out rate:	2%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 15 students
Student Course: Basic English and Reading from OSU (live) -- 15 students

Wilson Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 170 students in grades 9-12.
Equipment will serve 45 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	25%
Receive free or reduced price lunches:	45%
Are handicapped:	16%
Are racial or ethnic minority:	31% (Native American)
For whom English is a second language:	0%
Drop-out rate:	.6%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 13 students
Student Course: Trig/AnalGeom from OSU (live) -- 5 students

Wright City Public Schools

Rural school; qualifies for Chapter 1 assistance.
Equipment will serve 156 students in grades 9-12.
Equipment will serve 68 teachers, administrators, and support personnel in grades K-12.
Estimate of percent of students in the district who:

Receive Chapter 1 services:	15%
Receive free or reduced price lunches:	60%
Are handicapped:	Less than 1%
Are racial or ethnic minority:	39%
For whom English is a second language:	0%
Drop-out rate:	3%

Satellite programming received to date:
Student Course: German I from OSU (live) -- 11 students

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* For those schools marked with an asterisk, characteristics of the school's population are drawn from general information supplied by the school in its original application for a Star Schools grant (circa January/February, 1989). For all other schools, the characteristics are drawn from a survey of Oklahoma Star Schools completed in October/November, 1989.

APPENDIX J

Sample Newspaper Articles on Oklahoma Star Schools

Business Honors OSU Satellite Instruction Program

STILLWATER (AP) — Oklahoma State University's satellite television instruction program has been honored by a California telecommunications business as the top "distance learning" program in the United States.

The satellite program provides instruction to 5,000 students in 28 states and offers courses such as German, physics, calculus and geometry.

Leigh Walters, manager of the Oklahoma State Arts and Sciences Teleconferencing Service, said the program won the award because of high scores on standardized tests by high school students taking the courses.

Applied Business Telecommunications of California presented the award to Oklahoma State. TULSA WORLD 11/89

OSU TV Class Program Ranked Best in Country

By Jim Killackey
Staff Writer

STILLWATER —Oklahoma State University's program of satellite television instruction has received an award as the country's best, OSU officials said Wednesday.

"We've gone beyond our original dreams," said Leigh Walters, manager of the OSU Arts and Sciences Teleconferencing Service.

The award for the top "distance learning" program in the United States was given to OSU by Applied Business tele-Communications of California.

That organization annually evaluates satellite instructional programs provided to elementary and secondary schools.

OSU provides instructional TV programs to 5,000 students in 28 states.

Walters said OSU won the award because of high scores on standardized tests by high school students taking OSU satellite courses in German, physics, calculus, trigonometry and geometry.

OSU began televised instruction in the state in 1984, and offered its first high school German class in 1985.

There are 10 satellite classes, including new ones this fall in Russian, chemistry and applied economics.

About 2,500 Oklahoma students are taking satellite TV courses from OSU.

Walters said most of the students are from rural high schools that do not offer advanced and specialized courses.

Courses are taught by OSU faculty members, who also grade examinations sent to Stillwater.

Satellite courses are supervised in the classroom by local teachers.

Walters said OSU has plenty of competition in satellite instruction. But she said the more universities and private companies in the business the better, as long as students receive high-quality instruction.

Best In Nation

OSU School Satellite Program Gets Honor

Oklahoma State University has received an award for the country's best distance learning program in grades K-12.

The ABC Telecommunications award was presented to the OSU Arts and Sciences Teleconferencing Service (ASTS) at the distance learning profession's national meeting recently in California.

According to ASTS manager Leigh Walters, OSU won the award because of the performance on standardized tests by high school students taking OSU's German I and II and advanced placement physics and mathematics courses by satellite. The math courses are calculus, trigonometry, and analytical geometry.

ASTS has been teaching German I and II, physics, and mathematics courses for two to five years, with German I celebrating its fifth anniversary this year.

German I and II are taught by Harry Wohlert, physics by Peter Shull, trigonometry and analytical geometry by John Jobe, and calculus by Jim Choike, all of the OSU faculty.

Walters and ASTS marketing coordinator Missie Muerman travel extensively in their attempts to promote the courses to local superintendents and boards of education. As a result, ASTS courses are now being used in 28 states; up from 18 states in 1988.

Current enrollments are approximately 2,500 in German I, 500 in German II, 750 in Advanced Placement (AP) Physics, and 175 each for AP Calculus, AP Trigonometry, and AP Analytical Geometry.

New courses by satellite this year are Russian I, AP Chemistry, Applied Economics, and Basic English and Reading. The latter course, taught by former high school English teacher Joyce Nichols, is designed to upgrade reading skills of seventh and eighth graders "who are about a year or two behind in their reading levels," Walters said.

Russian I is taught by Leningrad native Victor Dmitriev, now of the OSU department of Foreign Languages and Literatures. John Gelder and Dwaine Eubanks teach AP Chemistry, and Don Bumpass teaches Applied Economics.

David Billeaux will teach AP American Government beginning in the spring semester of 1990.

ASTS already has plenty of competition in the distance learning field, but Walters said that the more universities and private companies in the business the better, as long as the students receive high-quality instruction.

Walters noted that, on average, students taking OSU's ASTS courses are bright and motivated. The satellite courses are supervised in the classroom by local teachers.

Most of the students are from small high schools which do not offer courses on ASTS's menu.

OSU service beams lessons to rural schools

By APRIL C. MURELIO
The Tulsa Tribune

STILLWATER — Shortly before air time, the professor glanced through his script and ran a powder brush across his face.

"When I was the only TV professor, the crew did this for me," Harry Wohlert said. "Oh well, times change."

Wohlert is one of nine Oklahoma State University professors who teach satellite-transmitted courses to high-school students in 28 states through OSU's Arts and Sciences Teleconferencing Service.

Planning for the service started six years ago as an idea to help rural schools meet updated curriculum standards.

Today, the network is one of the largest in the nation, offering foreign languages and advanced science and math to about 3,000 students in 375 rural schools, said Leigh Walters, program coordinator.

In 1983, she said, faculty members in OSU's college of arts and sciences voted to require beginning students to have two years of foreign languages.

Smith Holt, dean of arts and sciences, said, "Complaints began coming in from the smaller schools that couldn't afford to offer language courses, so we began looking for ways to help."

With a telecommunications center offering adult education classes by satellite already in place, Holt said, the next logical step was to use the technology to educate high-school students.

In the spring of 1985, about 14 Beaver High School students tuned in to Wohlert's German I class as part of a pilot program.

By fall 1985, Walters said, 50 schools — 49 in Oklahoma and one in Kansas — had signed up for the program.

"I must say that at first I was reluctant to do it," Wohlert said, "but now I'm more relaxed teaching in front of the camera than I am in my office or classroom. It is great fun."

He said his German classes have evolved from lecture the first year to a mix of speech and cultural experiences, including German rock videos and commercials, and taped broadcasts from the Berlin Wall.

"This program is like the Volkswagen," Wohlert said. "You started out with the Beetle and now you have the luxury sedan."

Wohlert said the four-week trip to Germany for himself and a three-member filming crew last summer cost about $60,000 and was paid for by the university satellite program.

He added that he paid for a live broadcast from Cologne, Germany, two years ago.

Jim Bouse, superintendent at Beaver, said that without the program his 149-student high school would not be able to offer foreign languages.

This year Beaver has about 10 students enrolled in German I and five in German II, he said.

Walters said each school buys or rents a satellite dish and computer terminals for its students.

Students watch live lectures transmitted from Stillwater, where the professor is standing in front of a camera on a set that resembles a television news studio.

Students can telephone the professor to ask on-air questions, phone in later, or send computer messages that are answered later, Walters said.

She said each high school provides a coordinator, usually a teacher of a related subject, who sits in on the class and grades the multiple choice tests provided by OSU.

Bouse said the satellite courses are part of the teachers' regular schedules and they are not paid extra for monitoring the classes.

Don Bumpass, executive vice president of the Oklahoma Council on Economic Education, began teaching applied economics via satellite this year as an adjunct professor.

He said the system presented a few challenges, including the loss of personal contact with students.

"The first day I went on the air my throat was so dry I couldn't swallow," he said. "I looked out and all I could see was equipment, no faces."

Bumpass said that the teaching resources available to the satellite network staff compensate for the lack of personal contact.

For example, he said, this year he will be conducting interviews with business leaders and former President Gerald Ford for the economics class.

Bumpass said the phone lines are manned continuously during the broadcast, and if he is covering a topic too fast or too slowly, the teacher at the school calls and he makes the necessary adjustment.

"The technology has stirred excitement in the schools, a renewed enthusiasm for learning," he said.

Sandra Harriman, a computer teacher who monitors the German I class at Webbers Falls, agreed.

"My job is to motivate and encourage, and I love it," she said. "Out of all the classes I've taught in 21 years, I enjoy this one most."

Harriman added that she also is learning German "right along with the kids."

Director Marshall Allen said the 50-minute lectures for the 10 courses — including German, Russian, physics, chemistry and calculus — offered this year are produced at the university's Educational Television Services building.

About a year is spent auditioning professors, designing computer software and developing the set and other instructional materials for each course, he said.

Also, Allen said, each of the professors teaching this year has a full-time producer and director to help with content effectiveness.

"We have to make sure that the professor has a good screen and camera presence because his message has to get through to the kids. That's what these schools are paying us for," Allen said.

Walters said schools pay a subscription fee based on the number of students they have enrolled.

In Oklahoma, she said, the school pays $500 per student to a maximum of $2,000 a year; out-of-state schools pay $600 per student to a maximum of $2,400.

Walters said that the first year a school is involved, it will spend $7,500 to $10,000 for the satellite dish, computers, television sets, phone lines, textbooks and the subscription fee.

Bouse said that to offer a traditional course, a school district like Beaver would pay a foreign language teacher about $22,000 a year, would spend about $28 per textbook and $15 per student for supplemental materials.

The state Department of Education gave $100,000 in grants this year to help 10 schools with start-up costs, said Barbara Spriestersbach, director of library resources/technology.

Last year, she said, 33 schools each received the $10,000 grants. The grants are given only to districts with fewer than 800 students.

This year, Walters said, the program is expected to generate $2 million. All money is used to develop new courses, purchase equipment and redesign software.

Until this year, Walters said, the classes were designed for high school students, but a basic English and reading class has been added for sixth, seventh and eighth grades, and OSU plans to add a foreign language class for elementary pupils next year.

Jim Wilson, superintendent of schools in Attica, Kan., said the high school, with 88 students, is starting its third year in the program.

He said an expanded curriculum is not the only advantage.

Wilson explained that even if the class is aired in the morning, it can be taped and offered again in the afternoon, allowing for flexible scheduling.

Wohlert said he has continued to teach by satellite because he believes the program offers more than the opportunity to take foreign languages and advanced science and math.

Wohlert told of one of his TV students from Melbourne, Ark., who was chosen recently to represent her state in a study program in Germany.

"We don't just teach the language, we bring the culture to these students.

"When the students are through with us they are not just living in their small community but they have a global view."

Tribune photos by Dave Cr

klahoma State economics professor Don Bumpass drinks his last gulp of coffee before beginning his telecourse, Applied Economic

Schooling by satellite

OSU German professor Harry Wohlert checks his microphone before a live telecast.

APPENDIX K

Press Releases for Oklahoma Star Schools

OSU

Oklahoma State University

ARTS AND SCIENCES TELECONFERENCING SERVICE
COLLEGE OF ARTS AND SCIENCES

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FOR IMMEDIATE RELEASE
April 26, 1991

CONTACT: MISSIE HESS
PHONE: 1-800-452-2787

U.S. SENATE'S LABOR AND HUMAN RESOURCES COMMITTEE LINKS UP LIVE WITH OSU'S AP AMERICAN GOVERNMENT BY SATELLITE

(Stillwater, OK)--The United States Senate's Labor and Human Resources Committee reviewed the investment of Star Schools grants on Wednesday, April 24 by hooking up live with Oklahoma State University's *Advanced Placement American Goverment By Satellite* course, team-taught by Dr. Robert Spurrier and Natalie Gentry.

Senator Edward Kennedy, D-Mass., chaired the committee looking at future legislation and appropriations for U.S. Department of Education's Star School Grants.

"When considering legislation, our committee calls upon experts to testify about their experience with the program. You are experts on distance learning and the Star Schools program," Senator Kennedy said.

AP American Government By Satellite students and teaching partners from Ohio, Mississippi, West Virginia, Alabama, Wyoming and Illinois were also linked live via-telephone to answer questions from the committee over their experiences with distance learning. Students from Perry High School in Perry, Oklahoma served as the in-studio host school and also answered committee questions.

Senator Paul Simon, D-Ill., explained that he could understand needing distance learning for courses like Japanese where there is a need for teachers, but he asked students what were the advantages of taking courses like *A P American Government By Satellite* compared to the traditional class set-up.

"You have an actual college professor that has a much broader education, including his doctorate, and schools can't afford that type of teacher," said Steve Thomas, a Spoon River Valley High School student in London Mills, Illinois.

A Midfield, Alabama student added that the special guests were a big advantage. He referred to his talking live via telephone with the United States Senate Committee commenting that these opportunities would not happen in a regular class.

Senator Jeff Bingaman, D-N.M., asked students if the technology got in the way of learning instead of facilitating it.

-more-

"We learn just as much in this program as we would in a regular government class, maybe even a little bit more because it's more in detail," said Cara Peterson, a Fredericktown High School student in Fredericktown, Ohio.

Chuck Lester, a Perry High School student from Perry, Oklahoma said the graphics used in the broadcasts helped him because they were directly related to the text readings and were covered in more detail.

The committee also asked team-teachers Dr. Robert Spurrier and Natalie Gentry about their experiences with distance learning and how it works.

Referring to the the course's use of video clips and graphics, Spurrier said, "We're trying to teach a generation that has grown up on MTV and is a visually-oriented generation."

"I know when I leave the studio here and go into a regular classroom, even though it's an honors class at Oklahoma State, I feel like I've left part of my equipment behind because I cannot do things nearly as easily in the regular classroom to illustrate visually what I'm teaching as I can here on the satellite course," he said.

In response to a question from Senator Kennedy about how examinations and grading were handled in the course, Gentry explained that she and Spurrier prepare the exams in Oklahoma, mail them to the teaching partners, and then grade the papers when they are returned by mail. From the exams, quizzes and two short papers, she and Spurrier compute the grade that the student would earn in a freshman-level college course--but the final grade on the student's high school transcript is assigned by the teaching partner.

AP American Government By Satellite is produced by OSU's Arts and Sciences Teleconferencing Service (ASTS) and is one of eleven courses taught live via-satellite to over 6,000 high school and middle school students in 32 states across the nation.

-30-

OSU

Oklahoma State University

ARTS AND SCIENCES TELECONFERENCING SERVICE
COLLEGE OF ARTS AND SCIENCES

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FOR IMMEDIATE RELEASE
February 25, 1991

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UNITED STATES ASTRONAUT STARS IN AP PHYSICS BY SATELLITE COURSE

(Stillwater, OK)--Not very many high school students can say they spent class time listening to an astronaut speak about his voyages, but students enrolled in the Advanced Placement Physics By Satellite course aired by Oklahoma State University's Arts & Sciences Teleconferencing Sevice (ASTS) can say they have now.

On February 19, 1991, AP Phyics By Satellite students listened to a live discussion via telephone with United States Astronaut Dr. Bob Parker. Parker was a member of the Columbia flight on the Astro One Mission in December 1990. Parker started his aerospace career in 1967 after teaching at the University of Wisconsin. He was also a member of the back-up crew for the Apollo 15 mission, along with being a member on shuttle missions in the early 1980s.

Students from the AP Physics By Satellite course were asked ahead of time to send in their questions to be addressed to Parker. The broadcast also aired a live call-in question. Parker answered questions over why some materials fall apart in the vacuum of space, what harmful changes an astronaut's body can go through, what it looks like from up above and what steps should be taken to pursue an aerospace career.

"He is an associate of mine from the late 70's. He was one of my Ph.D. thesis advisers at Rice University," said Dr. Peter Shull, professor of AP Physics By Satellite. "I thought it would be a unique opportunity for the students to be able to talk to an astronaut."

ASTS is a nationally-recognized leader in distance education. The program offers 11 live, interactive, satellite-delivered courses to over 6,000 high school and middle school students across the nation.

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Oklahoma State University

ARTS AND SCIENCES TELECONFERENCING SERVICE
COLLEGE OF ARTS AND SCIENCES

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FOR IMMEDIATE RELEASE
March 1, 1991

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PHONE: 1-800-452-2787

OSU'S SATELLITE STUDENTS LEARN ABOUT DEATH PENALTY RIGHTS FROM SPECIAL GUEST

(Stillwater, OK)--Oklahoma State University's *Advanced Placement American Government By Satellite* students had the rare opportunity of hearing Federal Division Chief Robert Nance of the Oklahoma Attorney General's Office speak live via-satellite on the February 27th broadcast about the constitutional rights of persons accused of crimes. He also discussed search and seizure with the *AP American Government By Satellite's* teaching-team of Dr. Robert Spurrier and Natalie Gentry.

Nance graduated with honors from OSU in 1975 earning a bachelor's in Political Science. As Federal Division Chief, Nance has argued and won two death penalty cases before the United States Supreme Court in recent years.

"Natalie and I were delighted to have Mr. Nance appear on our broadcast to acquaint students with the constitutional issues surrounding the death penalty and to respond to their questions about his successful arguments before the United States Supreme Court," Spurrier said.

Students enrolled in the course were able to call in on a toll-free number during the show to ask Nance questions.

AP American Government By Satellite is produced by OSU's Arts and Sciences Teleconferencing Service (ASTS), a nationally-recognized leader in distance learning. ASTS currently provides eleven courses to over 500 secondary schools nationwide.

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OSU

Oklahoma State University

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FOR IMMEDIATE RELEASE
January 26, 1991

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OSU Satellite Students Want To Know More About Gulf War

(Stillwater, OK)---The Persian Gulf War may be thousands of miles away from the United States, but Oklahoma State University's satellite students are receiving a close-up look right here at home.

The OSU Arts & Sciences Teleconferencing Service (ASTS) staff from its *Advanced Placement American Government by Satellite* course completely redrafted their January 17th script to focus on the Persian Gulf War. "The response was tremendous. Thanks to the work of the AP American Government staff and Educational Television Services (ETS), we were able to pull off a program that was literally up to the minute. This demonstrates the ability of satellite courses to be timely," said Dr. Robert Spurrier, professor of *AP American Goverment by Satellite.*

Spurrier said the broadcast covered four areas: civilian control over the military, the role of Congress in declaring war, the role of the President as Commander in Chief and the President's role as Chief Diplomat. The broadcast included C-SPAN clips from the first night of the war which gave a live assessment of the war.

"We even received calls about this particular war broadcast the next day when we were covering something different," Spurrier said.

The broadcast aired a video of Bush's address to the nation on the first night of the war and compared it to a video of Franklin Roosevelt's speech to Congress immediately following the Pearl Harbor attack in December 1941. Spurrier said Franklin's speech was the last time Congress formally declared war. "Far more wars have been fought without a declaration of war," he said. The students also discussed differences of the Vietnam War and the Persian Gulf War.

ASTS currently provides 11 live, interactive, satellite-delivered courses to over 6,000 high school students across the nation.

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CENTENNIAL
1890 • 1990

Celebrating the Past . . . Preparing for the Future

APPENDIX L

Other Articles on the Star Schools Project

THE ARIZONA REPUBLIC

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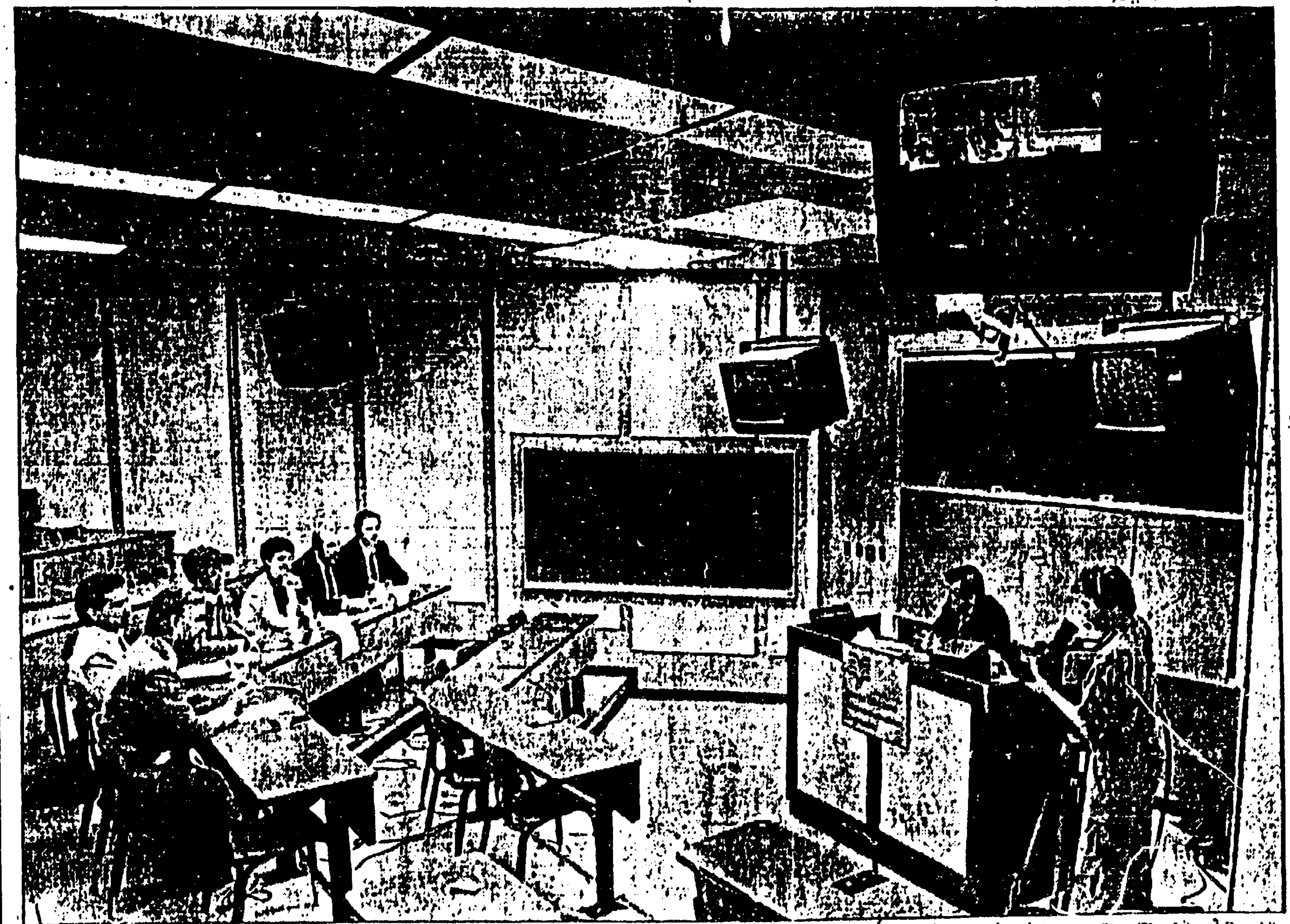
Phoenix, Arizona B 100th y



Suzanne Starr/The Arizona Republic

A panel of educators participates in a statewide teleconference on distance-learning. More than 600 school officials gathered Sept. 21 at sites in every Arizona county for an electronically transmitted discussion of how computers, telephones and video can be used to transmit courses.

Rural education served on a dish

By Karen McCowan
The Arizona Republic

ELFRIDA — The satellite dish sitting behind tiny Valley Union High School doesn't look much like a teacher.

But the black-mesh dish is providing German instruction to nine college-bound students in Elfrida. Students at Valley Union have never before had the option of studying German, because their 170-student school is too small to justify hiring such a specialized teacher.

This year, though, courtesy of a satellite orbiting 26,000 miles overhead, Valley Union has brought in a ringer.

His name is Harry Wohlert, a professor of foreign language at Oklahoma State University, and he's no mere talking head. The charismatic professor is introduced with a brassy theme song. He teaches 2,500 students in 17 states from a colorful, talk-show-style studio. And there are frequent video cutaways to snippets of life in Deutschland.

Such innovations as the 3-year-old "German by Satellite" course were the topic recently of Arizona's first statewide teleconference, held to dramatize the potential distance-learning offers.

More than 600 school officials gathered Sept. 21 at sites in every Arizona county for an electronically transmitted discussion of how computers, telephones and video can be used to transmit courses to remote sites.

In Elfrida, about 30 miles north of Bisbee, 20 area educators participated in the teleconference via the Valley Union satellite dish.

Existing distance-learning programs were praised for their educational promise and criticized for failing to extend to the most isolated rural areas.

But that could change, participants were told, because an $80,000 appropriation from the state Legislature will be used to draw up plans for an interconnected, statewide distance-learning network.

"Rural Arizona is a big place, and there are a lot of people out there with a lot of needs," said Michael Reed, superintendent of the Peach Springs Elementary School District. "I see telecommunications as, potentially, a great equalizer in education in this state."

For the Valley Union students, the satellite German class is an interesting experiment.

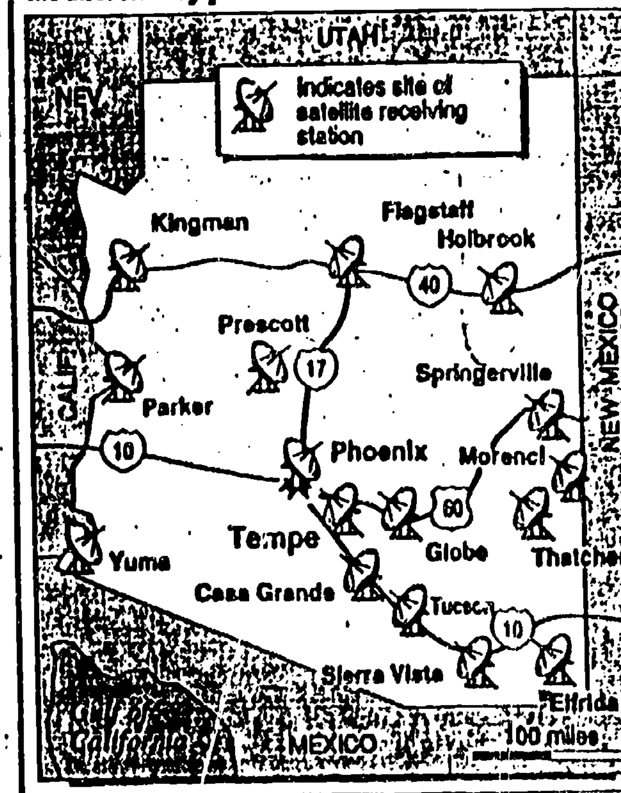
"It's more interesting than a regular class, because he shows music videos, commercials and little clips on buildings and cultural things, so we can see what it's like in Germany," said student Marisol Chacon, 14.

There are downsides, though.

— *See RURAL, page B6*

CONFERENCE BY SATELLITE

A panel discussion was beamed up to a satellite from ASU and transmitted to groups of educators who joined the discussion by phone from the sites indicated below.



Don Foley/The Arizona Republic

—RURAL, *from page B1*

Although the Oklahoma State course was designed as live and interactive, so students may phone questions to Wohlert as he conducts the class, time-zone differences mean the course is videotaped and shown later in the day to the Elfrida students.

"You have to call Oklahoma if you have a question about pronunciation or something, and you usually get an answering machine and have to wait for someone to call you back," said Monica Alvarez, 15.

Researcher Bruce Barker, an associate professor of education at the Brigham Young University branch in Hawaii, agrees that interactivity is a key breakthrough.

"We've had television instruction since the 1950s," Barker said. "But what's different now is that we can have interaction — the students can talk back."

Such interactivity galvanized Tom Campbell, Cochise County school superintendent, into investing $33,000 in county funds on satellite dishes for 11 schools. The Sulphur Springs Valley Electrical Cooperative, a local utility, has purchased dishes for nine more schools, and they were expected to be installed by Sunday.

Campbell's interest in distance-learning began last year, when he saw a videotape of an Ohio science class receiving a live biology lesson via satellite from Puget Sound, Wash.

"They had two-way audio, so the students could actually talk to a scuba diver as they watched him go down into Puget Sound," Campbell said.

"He would pluck up these sea creatures and hold them up to the camera as he talked about them. Those kids were on the edge of their seats."

Campbell said his decision to wade out into the wave of new technology has alarmed some Cochise County educators, who worry that distance-learning could replace the local curriculum — and those who provide it.

"But I'd get in bed with the devil for equity for our kids," Campbell said. "For whatever reasons, our kids haven't had the same opportunities as the kids in the big cities."

He added that he does not expect satellite dishes and computers to replace classroom teachers.

Research on distance-learning confirms Campbell's view.

Most early studies indicate that students learn as well in an electronically transmitted course as in a conventional classroom, said Barker, who is compiling a report on the effectiveness of distance-learning for Congress' Office of Technology Assessment.

"But most studies also conclude that, ideally, there should still be a qualified teacher to work with the students at the remote site," Barker added.

Not surprisingly, the National Education Association agrees.

"There are some visionaries out there who expect distance-learning to one day provide the entire curriculum," said Gary D. Watts, assistant executive director of the association. "But quality teaching is a matrix of professional decision-making, not just opening up a student's head and pouring information in."

Even interactive technology cannot replace an on-site teacher, Watts said.

"Obviously, if you've got 1,000 students watching, it can't be interactive for all of them," he said. "They can't all ask questions at once. Maybe two of them will get to. So what happens to the other 998?"

For that reason, Oklahoma State University requires that a certified local teacher work with students in its satellite German course despite the fact that it is equipped with a voice-responsive computer program that tells students when their pronunciation is correct.

"They (local teachers) may not speak German, but they can look into the students' eyes and see if they're comprehending the material," said Leigh Walters, director of OSU's telecommunications program. "And they can motivate the kids to call us if they need some help."

Thursday's teleconference also focused on distance-learning's potential contribution to higher education in Arizona, where many community colleges and universities are already using the new technology.

Holbrook-based Northland Pioneer Community College is using microwaves to simultaneously broadcast classes to nine branch campuses flung throughout the college's 21,000-square-mile district.

The system features two-way video, so instructors can look in on students at each of the sites throughout the class.

"This is far superior to teaching everyone together in a large lecture hall," said Pat Wulf, who teaches art appreciation as a distance-learning course. "The groups are small enough

Rural schoolhouse goes from 1 room to 1 dish

that I can get everyone's body language through the video camera, and they can get mine."

Arizona's universities are using the new technology to deliver classes to industry. Burr Brown Corp. of Tucson is one of 20 high-technology companies set up as a receiver site for interactive graduate courses in engineering.

As a professor lectures on campus at the University of Arizona, Burr Brown employees watch the live class on a television screen. If they questions, they phone them in, the professor responds on a spe phone.

"An engineer can walk right d the hall, take the class, ask quest participate in the discussion, walk feet and be back at work," said Henry, the firm's vice presiden component engineering.

"They don't have to drive t university or worry about fin parking. All the pain is gone."

Dr. Harry S. Wolhert

First 1990 inductee in the TeleConference Magazine's Hall of Fame in San Ramon, Califorina.

■ **Patrick S. Portway**

It is appropriate that in an issue of **TeleConference Magazine** devoted to Distance Learning that we announce the establishment of a permanent exhibit recognizing the man who's work on "German by Satellite" established a standard for all Distance Learning Programming.

Harry overcame the stereo type of Good Morning America television teaching. With the personality and style of a TV star, Harry Wolhert combined the latest in educational technology with high production values and creativity to produce not just an educational television program but an institution.

Harry has pioneered not only the successful delivery of German language instruction to high school students, but he has used state of the art computer technology to create a multimedia interactive educational program.

German by Satellite has grown from a program for one high school in Beaver, Oklahoma to 265 high schools with 2200 students.

Much of the credit goes to Harry's video personality. He is a master teacher and a television performer. He uses the medium to its fullest with video roll-ins from German TV broadcasts to specially filmed segments that hold the live young audience's attention.

Harry and a crew from Oklahoma State University Telecommunications Center went to Germany last year to film cultural and background material for German by Satellite. Harry commented in our interview that he wasn't aware how significant some of the footage would be when they filmed the Berlin Wall.

Harry is an escapee from East Germany himself, and he knows the significance of change in Germany from first-hand experience.

Among the things Harry and his crew filmed was a segment on the German Autobahn, showing that there is no restriction set on the speed limit. The crew filmed from the seat as Harry accelerated a rented car to 65mph to 85mph to 100mph and finally to 120mph. All of this was done while pointing out how to read and pronounce German road signs

> *"Harry has pioneered not only the successful delivery of German language instruction to high school students, but he has used state of the art computer technology to create a multimedia interactive educational program."*

Harry's German I and II are now only one of many programs available to High Schools from OSU's Arts and Science department. There's a tendency at OSU to wait to give equal importance to the Russian Physics and Calculus programs. But German by Satellite is always the program people use as an example and a standard of excellence in Distance Learning.

Harry recognized early on the need to use other technologies for interaction with students in his vast audience. He pioneered the use of Apple Computers with voice recognition and voice simulation for language drills. It was Harry Wolhert who first introduced me to hypermedia and the potential of CD ROM.

Harry's wife, Hilda, is also a professor at OSU has taken over more and more of the responsibilities of the program. The two of them and Harry's staff give out over 65,000 grades a year for the course tests and quizzes.

Some of the high schools where Harry's program is received have only three or four students while others have larger classes. In most cases, the school would not offer German if it's was not for German by Satellite. In a few schools, Harry's lectures are used a supplemental material by qualified local German teachers.

My daughter and I traveled with Harry to Germany a few years ago and I am proud to count this fine gentleman as one of our industry's most significant pioneers. ■

Harry S. Wohlert

*Harry obtained his Bachelor of Science in Psychology, his Master of Arts in Germanic Literature and Linguistics and his Doctor of Education from the University of Oklahoma. Part of his vast teaching experience include: Noble Professor of Technology*Enhanced Learning Systems, Endowed Chair and Co-Director of OSU's International Cooperative Education Program Wohlert has been a Professor at Oklahoma State since 1968, teaching German language and literature; he has developed and taught German by satellite since 1985. He is a member of several language, computer and distance learning technology organizations. Wohlert is President of the Oklahoma Foreign Language Teachers Association, endorsed by the Noble Foundation and Apple Computer. Inc. grant. He was given the "Distinguished Achievement Citation" from Lt. Governor of the State of Oklahoma and the "Teacher of the Year" award from the College of Arts and Sciences at OSU.*

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APPENDIX M

Letters of Endorsement

United States Senate

COMMITTEE ON LABOR AND
HUMAN RESOURCES

WASHINGTON, DC 20510-6300

April 25, 1991

Mr. Malcolm Phelps
Director
Education Extension
408 Classroom Building
Oklahoma State University
Stillwater, OK 74078-0585

Dear Mr. Phelps:

Thank you for facilitating OSU's participation in our 'Star Schools for All Our Students' hearing before the Labor and Human Resources Committee yesterday.

Mr. Bob Spurrier, Ms. Natalie Gentry and the AP American Government students presented a very strong demonstration of the effectiveness of distance learning that I am sure will stay with the members of the Committee for a long time. Their comments will be particularly helpful as the Committee progresses with the reauthorization of the 'Star Schools Assistance Program'. OSU's work in the field of distance learning is very impressive and should certainly serve as a model for other networks across the country.

Thank you again for your assistance.

Sincerely,

Edward M. Kennedy

OSU

Arts and Sciences Teleconferencing Service
Life Sciences East 401, Extension 7895

MEMORANDUM

To: Malcolm Phelps
From: Holly McCoy, ASTS Marketing Assistant
Date: February 6, 1991
Subject: Star Schools Report

Missie asked me to find some anecdotal stories or quotes for you to include in the Star Schools Report. I can't find any stories from BEAR but I can give you some quotes from teaching partners. Russian is suppose to be sending me some stories (hopefully) and I will give you a call about those. I have also included a copy of a letter from one of the BEAR teaching partners - it had a lot of complementary quotes so I copied it. Here are some quotes from other BEAR teaching partners:

"The students were very unsure of themselves going into the project. They were also proud of themselves after completing their cinquains," said Julia Sutherland, Forrest County Agricultural High School in Brooklyn, Mississippi.

"I think the RIP (Reading In Progress) curriculum is excellent, and I feel the students are learning - sometimes despite themselves. Thanks for RIP, --- it's great," said Gerri Hilger, Bronaugh K-7 School in Bronaugh, Missouri.

If you have any questions or need anything else, give me a call. I'll call you as soon as I get the Russian stories.

COLONEL SMITH MIDDLE SCHOOL

Fort Huachuca Accommodation Schools
P.O. Drawer Q (Building 67601)
Fort Huachuca, Arizona 85613-0017
(602) 458-7668

October 29, 1990

Dr. Joyce Nichols
ASTS
401 Life Sciences East
Oklahoma State University
Stillwater, OK 740-0276

Dear Dr. Nichols

I would like to take this opportunity to introduce myself and the Smith Middle School component of your READING IN PROGRESS program. As the Remedial Reading Specialist I was enthused when Mr. Tom Campbell gave me a tape to view that would alter my approach to working with high - risk students.

In the past I have been hesitant to use computers primarily due to the poor quality of software. The RIP program has incorporated high interest and motivatiional software, blended with an emphasis on real life skills, and stresses writing skills. I commend you on your program.

Included in this packet are the baseline scores for the reading rates, some poetry samples, and a video of the class. Also, for your convienence is a map to help locate our District.

The students enjoy the video portion of your presentation, the clarity of your lessons, knowing what is expected of them for the week. In addition, they appreciate the lack of emphasis on grading vs. a greater emphasis on attempting the work.

I am looking forward to meeting you this summer when I attend the training session in Oklahoma. Until then keep up the good work.

Sincerely,

Vince Ramirez
Chapter 1 Reading Specialist

THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT

FINAL EVALUATION REPORT

Submitted to the
United States
Department of Education

As required by
Grant Award R203A80036,
Star Schools Program

EVALUATION AND RESEARCH SECTION OF THE

MIDLANDS CONSORTIUM FINAL REPORT

CAROL SPETH
JOHN POGGIO
DOUG GLASNAPP

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RESEARCH SECTION

EXECUTIVE SUMMARY

The Midlands Consortium Research and Evaluation Center leaves behind a wealth of empirical findings which should advance the study of satellite-based distance education. In a nutshell, we found that students at all achievement levels can and do learn effectively by satellite. We found that conventional instruction is not always better than satellite instruction, either in terms of students' achievement or their affective reactions to the educational experience. We found no significant difference in test scores between satellite and conventional students on nationally-standardized subject-area achievement tests. We found that grades are lower in satellite classes, but those students who persisted until the end of the year appreciated the opportunity to take the courses. And a fairly large percentage said they planned further study of that subject in college.

We found that students often take the advanced placement classes for college practice rather than for college credit. Having an opportunity to take difficult and challenging courses in a familiar environment gave students in small rural schools additional confidence in their own academic abilities and reassurance that they could survive in more competitive post-secondary educational environments.

According to several definitions of the the term "at-risk," we found that students "at-risk" can and do learn effectively in courses by satellite. One course included a large proportion of average or below-average students with low academic self-confidence, yet they responded with particular enthusiasm to satellite instruction, even saying they preferred it to a regular course.

We found that students in poor districts (where high proportions of students were eligible for the subsidized lunch program) often did quite well in the satellite courses, not only in terms of individual achievement but also in terms of class achievement. We found that students in districts with high concentrations of minority students and a tradition of low educational expectations flourished in courses by satellite, furnishing several examples of outstanding individual achievement. We found that the level of education attained by students' parents made no significant difference in their grades or test performance in satellite classes. Even students whose parents only went as far as the eighth grade did well in satellite courses, which often represented their only opportunity to take those subjects in high school.

We found that one subgroup of students (said to have a "Non-Academic Orientation" toward their schoolwork) who were sadly lacking in motivation at the beginning of the year somehow managed to score above the mean in satellite, but not conventional, courses on standardized tests administered near the end of the year. We found that while satellite courses provide highly-motivated and academically-talented students with an opportunity to take more challenging courses, students without those characteristics were at no more of a disadvantage than students with similar characteristics who were taking the same courses taught entirely by a local teacher.

Looking at various aspects of learning environments, we found far more differences among subject areas than between the two delivery methods (satellite or conventional). Given a choice, students in most subject areas would prefer to have a local teacher fully qualified in that subject who could instruct them five days a week. But when their districts cannot provide them with that opportunity, the overwhelming majority of students found this mix of satellite and local instruction an acceptable and welcome alternative.

We found that students who viewed the satellite instructional programs on tape did as well in terms of grades and test scores as those who viewed the programs live. But students who viewed the taped instruction did not interact as often and they gave significantly lower overall ratings to their satellite courses--suggesting that live interaction does make a perceptual difference in the quality of students' learning experience. Additional research on this question is needed, but it appears that the higher production costs and local inconvenience of allowing students to participate in live satellite instruction is justified. However, if it is not possible for a school to schedule the class during the live telecasts, students can also learn from seeing the same instruction on tape. School officials might be advised to facilitate and specifically encourage students to interact with the satellite instructors at other times of the day.

The Research and Evaluation Center studies indicated that the satellite instruction offered by Midlands Consortium with a combination of on-air and carefully guided off-air local instruction is effective:

(1) in promoting achievement outcomes when compared to conventional instruction;

(2) for students with different levels of prior achievement and different motivational and learning style characteristics;

(3) in providing learning environments comparable to courses taught entirely by a local teacher;

(4) in providing worthwhile opportunities for interaction; and

(5) in providing educational opportunities to students in small rural schools, academically gifted students, students "at-risk," and economically disadvantaged students.

I. CHRONOLOGY OF RESEARCH AND EVALUATION CENTER WORK

I. CHRONOLOGY OF RESEARCH AND EVALUATION CENTER WORK

From the outset, Midlands Consortium made a commitment to an evaluation and research program that would contribute to the knowledge base distance learning by satellite. Research and evaluation efforts of the Midlands Consortium were supported by staff from the Center for Educational Testing and Evaluation at the University of Kansas. The staff of the Midlands Consortium Research and Evaluation Center consisted of Drs. John Poggio, Douglas Glasnapp, and Carol Speth, two graduate students, and several clerical and student workers. All were part-time on the Star Schools Project except for Carol Speth, who was full-time on the project. The Center's initiatives were reviewed by the Midlands Consortium Research and Evaluation Committee. MCREC provided oversight and direction for the consortium's research agenda but delegated primary responsibility to the Research and Evaluation Center. However, MCREC decentralized the primary responsibility for evaluation and needs assessment to state directors.

The months of October and November 1988 were spent gearing up for the Star Schools Project, defining personnel needs, doing an external search, advertising and recruiting. After a national search, Dr. Carol Speth was hired at the close of January 1989, and began work in February. During February, Drs. Poggio and Speth visited key Midlands personnel at Oklahoma State University in Stillwater; Kansas State University in Manhattan; the University of Alabama in Birmingham, Missouri School Boards Association in Columbia; and met with staff from the University of Mississippi. These meetings were for the purpose of assessing evaluation needs and research interests at each site as well as for orientation and introductions.

The month of March was spent in planning and discussion, background reading, writing, and consultations by mail and phone. In March and April, we drafted a Request for Proposals for the Midlands Consortium research mini-grant program, circulated drafts among the Research and Evaluation Committee members, and made revisions according to their suggestions. The Request for Proposals (included as Appendix F) was eventually issued from each participating institution with a June deadline for submission.

In March and April there were long staff meetings to develop an evaluation plan to meet the needs of Consortium members (identified during the site visits in February) and develop instruments. Considerable hours were spent on development of a comprehensive bank of items directed at the following audiences/clients: district and building administrators, school personnel involved in staff development by satellite, school personnel involved with student courses by satellite, and students taking courses by satellite. At that time, it was expected that the Research and Evaluation Center would be responsible for the evaluation of Midlands' programs, since our staff had considerable experience in that area. Our goal in developing the item bank was to allow ease of processing and analysis, and facilitate a Consortium-wide consistency in how questions were asked so that data from different states and programs could be compared as needed. We intended to supplement the product-oriented information sometimes assembled by producers, and contribute to a better understanding of the learning processes and motivations of various audiences/clients. Yet we aimed to allow individual states--either as producers or consumers of satellite programs--some flexibility for tailoring the items to their needs.

To accomplish these goals we developed a set of three comprehensive item banks that state coordinators and program producers could use to tailor survey evaluation instrumentation to their sense of priority and importance. One item bank had questions for school administrators. These questions emphasized the acquisition, installation and use of equipment, the value and appropriateness of the programming they received, and the extent to which their school's needs were being met by the instructional and inservice programming they received. A second item-bank would have enabled more consistency in evaluation of Midlands inservice programs. This particular bank of items was prepared to serve in a pre- and post-testing design framework (if desired) and ranged across such dimensions as expectations for self, others and students; value and worth of the training and the experience itself; utility, suitability of the information disseminated; quality and usefulness of support materials; design features of the programming that aid or compromise the offering, etc. This item bank was designed for use by inservice participants and site coordinators. The third item bank was specifically designed for students (at grades six and above) and coordinators to evaluate courses by satellite (in addition to elements mention above), and was intended to afford greater communality in the evaluative effort across sites, permit the comparison of programs by different producers, and allow producers to learn from each. The item banks were reviewed and edited by state directors and their staff in June. This item bank is included as **Appendix A**.

In addition to development of evaluation item banks, it was decided that preparation of a needs assessment survey to service state directors future planning and the preparation of a review of the literature on distance education would be tasks of the MCREC unit. Later sections of this report will provide information on these tasks.

On April 30-May 1, the Midlands Consortium Executive Policy Committee had its quarterly meeting in Lawrence, so some staff time was devoted to planning, coordination and transportation from Kansas City International Airport as well as the usual report-writing. Early in 1989, John Poggio went to Washington, D.C. with Ken McKinley and Connie Lawry from Oklahoma State University to meet with Office of Educational Research and Improvement (O.E.R.I.) officials and exchange views with Office of Technology Assessment personnel. One outcome of those discussions was a decision to call together representatives of all four Star Schools Project Consortia and attempt to reach a consensus on the type of evaluative information to be gathered. That meeting took place at O.E.R.I. in Washington, D.C. on May 17, and was followed by many hours of work to develop instruments and procedures for collecting and reporting that data, distributing drafts for review by the Research and Evaluation Committee, and revising according to their suggestions. The forms developed for this purpose are found in **Appendix C**, and the responses received are found in the **Research and Evaluation Center's Final Report Section II--Evaluation.**

During May and June, the professional staff spent many hours preparing for the Midlands Consortium Research and Evaluation Committee (MCREC) Meeting in Kansas City in June 1989. To a great extent, the Research Agenda (found in **Appendix D**) would define the targets for all research activities was based on issues raised during the initial site visits in February. MCREC approved the research agenda as proposed, but gave individual satellite instructors the option of participating or not. Participation by school personnel and students was to be strictly voluntary, and the rewards of participation would be purely intrinsic. After long discussions concerning the draft forms for reporting data to O.E.R.I., a number of changes and revisions were suggested. Concerning the evaluation plan, MCREC's decision was that evaluation of Star Schools programming was the responsibility of the program producing institutions, who would solicit help from the Research and Evaluation Center staff as needed. Only one state, Mississippi, decided to use the evaluation item bank as a whole. Copies of those forms and the results of that evaluation are found in **Appendix E** and in the **Research and Evaluation Center's Final Report Section II--Evaluation.**

The Midlands Consortium Research and Evaluation Committee, acting through the offices of the state directors, issued a request for proposals for small grants to faculty and graduate students to do research on education by satellite. A sample call for proposals is included as **Appendix F**. The intent of this small grants program was to entice established researchers from other disciplines into the field, and to bring emerging researchers to the discipline. Costs were shared by the Consortium (approximately two-thirds of each grant) and each participating institution (approximately one-third of each grant). At the June 16 meeting, MCREC evaluated the 13 mini-grant proposals and decided to fund five of them at the $3500 level. Proposals were evaluated on the basis of their potential contribution to a theoretical understanding or model of distance education delivered by satellite. Studies examining audiences that could be described as rural, economically-deprived or educationally at-risk were especially encouraged. The program was instituted in Year 1, and monitored during the second year. The grant recipients, their mailing addresses and the titles of their proposed studies are listed below. The research reports are found in **Appendices G through K**.

Principal Investigator: Loren Alexander
Project Title: Interaction analysis of Spanish by satellite
Principal Investigator Address: Modern Languages Department, Eisenhower Hall
Kansas State University
Manhattan, KS 66506
(913) 532-6720

Principal Investigator: Rosemary Talab
Project Title: Survey of the Kansas distance teaching partner and principal
Principal Investigator Address: Department of Educational Technology
224 Bluemont Hall
Kansas State University
Manhattan, KS 66506
(913) 532-5716

Principal Investigator: Robert Hohn
Project Title: The introduction of satellite television in Kansas rural schools: Two intensive case studies
Principal Investigator Address: Department of Educational Psychology and Research
2 Bailey Hall
University of Kansas
Lawrence, KS 66045
(913) 864-4526

Principal Investigator: James Wells
Project Title: Isolating effective computer aided instruction approaches in a distance learning environment
Principal Investigator Address: Department of Foreign Languages, 230 Math Sciences
Oklahoma State University
Stillwater, OK 74078
(405) 744-9540

Principal Investigator: Connie Dillon
Project Title: Innovation and instructional telecommunications: The integration of satellite technology and the professional development of public school teachers
Principal Investigator Address: Department of Educational Leadership
Collings Hall, Room 227
University of Oklahoma
Norman, OK 73019
(405) 325-4202

Since two of the funded proposals made the role of teaching partners the central focus of their studies, that part of the Research and Evaluation Center's agenda was de-emphasized. We made other adjustments in our research agenda and sampling procedures to accommodate instructors' complaints about our using class time to gather data, avoid placing excessive burdens on school personnel, and enable the other researchers to recruit enough subjects. Since other Midlands Consortium-sponsored studies were recruiting from the same finite population of schools and students, we were not as persistent about following up initial refusals as we might have been otherwise. We invested a great deal of time, effort and other resources to maintain good relations with school personnel and students in order to keep attrition down; still there would be quite a drop off in participation near the end of the school year.

Five research studies were proposed to serve as the core component of Midlands' research agenda (included as **Appendix D**): four emphasizing courses for students, and one emphasizing staff development programs. All studies were planned to offer reasonable research design controls relying on sampling, measurement and statistical methods that heighten the precision and power of analyses. Each inquiry was designed to achieve maximum generalization of findings. The methodology for these investigations is detailed in the material provided in **Appendix D**.

One criterion of effectiveness is how well satellite students do on standardized subject-matter tests compared to students in conventional classes. Such comparisons were possible in five of the eleven subjects taught by Midlands Consortium producers. Other measures of student performance were solicited, including grades, self-reported learning, expected grades and general satisfaction with the course.

Another criterion of effectiveness is whether satellite instruction only benefits students who are high in ability and/or motivation, or whether average or below-average students can also learn from it. Student characteristics considered for this study included learning style, incoming grade point average as a proxy for ability, self-rated academic ability, and parents' educational level.

A third criterion of effectiveness relates to students' perceptions of learning environments. Components of perceived learning environment included individual students' perceptions of the cohesiveness or goal direction of the class; the degree to which the teacher or teaching partner was supportive of their learning, maintained control of the class, and helped them to develop good study skills. The design of this part of the research recognized the possibility that students with different incoming abilities and attitudes may perceive the same course experience quite differently. For example, a highly-motivated and self-confident student might find almost any environment supportive while a less motivated or less-confident student might complain about the lack of support.

A fourth criterion of effectiveness addresses the comparative question of whether students instructed via satellite learn at rates equal to their peers in conventional classes. To allow the comparative question to be evaluated, conventional comparison classes were always recruited from the same collection of small rural schools that were subscribing to courses by satellite. For example, a school might be taking Physics by Satellite by offering Spanish as a conventional class. Students in the Spanish class contributed data to the conventional Spanish experimental group, which would be compared to students taking Spanish by Satellite. It would not be fair to compare a conventional class in a large urban or suburban school to a satellite class in a rural area. In this way, some control of the self-selection variable was afforded and equivalence of samples maintained.

The following research questions and comparisons along with a brief synopsis of the study's structure were approved by MCREC on June 16,1989:

1. How important is the live, interactive feature in influencing cognitive and affective outcomes?

Study 1 compared student achievement in live vs. taped; and interactive vs. non-interactive delivery by looking at students who watched the programs (a) live and made frequent use of the interactive capabilities, (b) live but made no or only minimal use of the interactive capabilities, (c) on tape and made no use of the interactive capabilities.

2. How much and how well do students learn in these courses? Which students benefit most?

Study 2 compared students characterized by different learning styles, skills and motivations on both quantifiable outcomes measured by standardized tests, and qualitative outcomes important to success in distance learning.

3. How effective are these courses compared to conventional courses?

Study 3 compared students in courses taught conventionally with courses taught by satellite with broadcasts two or three days a week and supplemental activities the other days. Comparisons were made in terms of student achievement on standardized tests, and other cognitive and affective outcomes.

4. What influence do contextual features such as classroom climate, satellite instructor or teaching partner characteristics have on student outcomes?

Study 4 looked at how course components relate to different kinds of outcomes for different kinds of students.

5. How do inservice programs by satellite compare to more conventional types of staff development in terms of the likelihood that participants will use what they learned? Does type of staff development delivery make as much difference as content, presenter, or participant characteristics?

This study of the effectiveness of staff development programs would have used data on job category; years of experience; school size, location, and Chapter 1 status; and extent of interest in the topic and type of motivation for attending. In order to control for presenter capabilities or characteristics, Study 5 would have required identifying presenters who do the same program content for the same types of audience both (1) live and in-person and (2) by satellite. It would have also required getting the names and addresses of both satellite and conventional staff development program participants in order to collect follow-up data and find out if participants remembered any of what they had learned, and whether they were using the staff development content in their classes.

During June and July, staff time was spent preparing contracts for the mini-grant recipients, negotiating with the grant offices of each university involved, and working with the recipients by phone and by mail. During July and August, many hours were devoted to finalizing data-collection procedures, administration instructions, corresponding with school personnel, and developing surveys and mailing lists for the research study. Particular pains were taken to direct the research questions toward exploring the effectiveness of satellite instruction in general rather than targeting individual courses or instructors. On July 19, Drs. Poggio and Speth were in Stillwater to meet with the Oklahoma State University satellite instructors individually and as a group regarding the research program. The instructors and staff present at that meeting agreed to participate and to share test and other data on cognitive outcomes gathered within their courses, so that it would not be necessary for the researchers to burden teachers and students with additional or duplicative assessments.

In August, Robert Young and Susan McClelland came to Lawrence from the University of Mississippi to discuss that state's evaluation needs with John Poggio and Carol Speth. They planned a thorough evaluation along lines set out by the Research and Evaluation Center item bank, obtaining data from superintendents, principals, teaching partners and students regarding Midlands courses by satellite and other services. The instruments developed for that evaluation are found in **Appendix E**, and the results are found in the **Research and Evaluation Center Report, Section II--Evaluation**.

Also in August, Carol Speth went to Kansas State University to discuss their evaluation plans and participation in the research program. In August, during a meeting to develop topics for University of Kansas' staff development satellite broadcasts for spring 1990, the need to find an alternative means for uplinking the third and final COMETS broadcast was discussed, and the possibility of doing that broadcast from the Regents Educational Communications Center at Kansas State University with a combined crew was suggested. That program, telecast on September 26, was an educational experience for in-studio participants as well as viewers, allowing us to compare the advantages and disadvantages of different personnel, studio and equipment decisions made within the context of the Star Schools Project.

The initial process of recruiting satellite classes for the research program in August and September was followed by a second process of recruiting conventional classes from those same schools in September and October. Each school was asked for permission to collect data in one of their conventional classes, in order to avoid overburdening individual schools, teachers or students. The first survey assessing students' learning styles, levels of cognitive processing, type of motivation, and typical study habits was administered in September-October 1989. (The first survey is included in **Appendix L**. Results may be found in **Research and Evaluation Center Report Section III--Research**.) The paperwork and record-keeping requirements for the research on student courses proved to be enormous and laborious. Some data might have been lost at that early stage for lack of follow-up contacts, but we made a deliberate decision to avoid harassing school personnel. Although some courses seemed over-represented initially, we did not want to turn any willing participants away. That proved a wise decision because of attrition at the end of the year. A great deal of care and attention was given to our correspondence with school personnel and writing instructions which were comprehensive and not confusing.

Considerable time was devoted to unsuccessful efforts to initiate and carry out research on the Midlands Consortium staff development programs by satellite. It was essential to find presenters who did comparable programs live and in-person for the same kind of audience. It was not possible to carry out this study as planned, because we were unable to identify any presenters of the Midlands Consortium staff development programs who actually deliver the same content by satellite as they give when they are speaking live and in-person. One presenter said he gave similar content, but the audiences served by the two delivery methods were not the same. After many calls to past and future presenters of the Midlands Consortium staff development by satellite programs from Missouri School

Boards Association, Kansas State University, Oklahoma State University as well as the University of Kansas, we concluded that the medium of satellite delivery determines the message to a far greater extent than we had previously thought. The only valid way of comparing the effects of a staff development workshop offered live and in-person with one offered by satellite would be to plan and pay for the identical workshops--one in-person and one by satellite--to be offered to matched or at least comparable audiences. Funds were not available for that purpose and Study 5 of the Research Agenda was abandoned in February 1990.

A somewhat unexpected but rewarding part of this project has been advising new researchers in distance education by satellite, who were sometimes referred to us by Oklahoma State or Kansas State Universities or Missouri School Boards Association. These requests began in the fall of 1989 and continued into 1991. Some doctoral students asked for references to good empirical research on distance education by satellite. Some asked for advice concerning the topic they were considering, whether it had been researched before, and where would they turn for references. Some sent the instruments they were developing and asked for advice. Here is a list of those contacts requiring a follow-up mailing.

Dixie Fisher
University of Southern California

Jane Cater
University of the Ozarks

Darrell Beasley
Liberal, MO

Ted Allen
Dickson, TN

Rhonda Meyer
Otterville, MO

Arlene Fleming
New York, NY

Sharon Ford
Manhattan, KS

Rick Mihalevich
Missouri School Boards Association

Bill Roweton
Chadron, NE

Jenny West
Sublette, KS

Molly Baker
Macomb, IL

Office of Technology Assessment
Washington, D.C.

During October and November 1989, we finished construction of a needs assessment survey which was sent to MCREC members (a copy is included in **Appendix N**). We also continued work on the monograph and seeking third-year funding from private foundations believed to be interested in such research. We continued seeking information on standardized tests for end-of-year final examinations, and asking satellite instructors to evaluate one or two such tests for possible use in their courses. We spent many hours working with satellite instructors and obtain their cooperation in the standardized testing phase of the research.

Applied Economics by Satellite was only taught in the fall semester, providing an opportunity to pilot test the survey measuring class climate or learning context. Although Applied Economics by Satellite participated in a formal standardized testing program, using the Test of Economic Literacy, the process of obtaining those results was complicated by Formative Evaluation Research Associates of Ann Arbor and Junior Achievement.

After preparing a quarterly report for Midlands Executive Policy Board Meeting in Birmingham in January 1990, Carol Speth went to Oklahoma State University for meetings with individual instructors regarding their participation in the research program. A similar meeting with the Kansas State instructional staff and evaluation committee took place later in January.

In March 1990, John Poggio and Carol Speth met with Susan McClelland from the Office of Distance Learning to finalize Mississippi's evaluation of satellite instruction in that state, by adapting the evaluation items developed for the Consortium to that state's specific needs. Since Mississippi schools were not subscribing to many staff development programs, it was decided to concentrate on evaluation of student courses. Those surveys (found in **Appendix E**) were sent in early May and results are found in **Research and Evaluation Center Final Report Section II--Evaluation.**

In March 1990, local teachers of both satellite and conventional classes were called and asked to participate in the standardized testing phase of the research project. Conventional Spanish, economics, physics and chemistry teachers were contacted by phone to "touch base" and specifically request their assistance in the research activities to be completed by the end of the school year. These conventional classes served as control groups against which satellite classes would be evaluated on a class climate or learning environment measure and a nationally standardized subject-area achievement test. Only two out of the forty conventional teachers contacted declined to participate because of scheduling problems.

The second survey, "About This Class," administered early in April 1990, included subscales on class climate or contextual features and teacher characteristics which are typically related to achievement outcomes. This survey (included as **Appendix M**) also asked for students' overall rating of the courses, how much they felt they learned, what grade they expected to get, and whether they preferred satellite instruction over a regular course. Some of the analyses reported in **Research and Evaluation Final Report Section III--Research** used these evaluative questions as dependent variables.

We attempted to obtain cognitive achievement outcomes for all courses, including as many schools and students as possible, but were not always successful. We negotiated at length with the satellite instructors concerning what to do about courses where no appropriate nationally standardized tests were found. In some subject areas, the test was incorporated into course requirements; in other subjects, administration the test was entirely at the discretion of the local teacher or teaching partner.

The summer and fall of 1990 and winter of 1990-91 were devoted to data retrieval, processing and analysis. The size and complexity of the data files; the number of variables; the need for complex programming procedures to account for missing data, empty cells, file mergers and analyses of subsets of variables required considerable extra time.

Throughout the period of funding, we have been committed to dissemination of our efforts and findings. The following capsulize some of these activities. We read and commented upon the Office of Technology Assessment-sponsored review of the literature on distance learning in the summer of 1989. In April 1989, Carol Speth was asked to speak about the research literature on technology-based distance learning and Midlands' potential contribution to that research at the Second Annual Missouri Conference on Technology in Education in Jefferson City. Carol Speth and John Poggio made a presentation entitled, "Distance secondary education by satellite: An emerging research agenda" at the Fifth Annual Conference on Learning by Satellite in Tulsa in March 1990. In August 1990, Carol Speth presented a paper based on the individual differences part of the Research Agenda at the Distance Teaching/Learning Conference in Madison, Wisconsin. An article, "Distance learning: Similarities and differences in characteristics of incoming students in satellite as compared to conventional courses" was published in the Fall 1990 issue of the Missouri Journal of Educational Technology. Two papers, "Ethnicity, learning style and reactions to satellite vs. conventional courses," and "Learning environments in satellite and conventional classes" were presented at the American Educational Research Association Annual Meeting in October 1991. A paper called, "Interaction, Socio-Economic Status and Achievement" was presented at the Joint Conference of the Educational Computing Organization of Ontario and the International Conference on Technology and Education in Toronto, Canada, in May 1991.

II. EVALUATION

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Rationale for Evaluation Activities

Originally, the Research and Evaluation Center staff expected that they would be directly responsible for the evaluation of Midlands Consortium programs. But recognition of various realities including: (1) the geographical distance spanned by Midlands Consortium (travel costs); (2) the multitude, frequency and topical variety of programs being uplinked; (3) the lead time required to understand program content and objectives and have instruments ready for mailing; and (4) the number of people involved in each program who needed to be contacted for information--soon made it plain that it would not be possible to be specifically involved in the evaluation of all or even most programs. Along with offering to provide direct and specific help to any producer who wanted it, another way of making assistance widely available was by developing a comprehensive bank of items directed at the following audiences/clients: district and building administrators, school personnel involved in staff development by satellite, school personnel involved with student courses by satellite, and students taking courses by satellite. One goal in developing the item bank was to allow ease of processing and analysis, and facilitate a consortium-wide consistency in how questions were asked, so that data from different states and programs could be compared. Another goal was to allow individual states--either as producers or consumers of satellite programs--some flexibility for tailoring the items to their needs.

To accomplish these goals we developed a set of three comprehensive item banks that state coordinators and program producers could use to tailor survey evaluation instrumentation to their sense of priority and importance. Items were specifically designed for the various audiences served by Midlands Consortium programming: students grades six and above (40 formative and 62 summative evaluation items, designed to be used in a pre-post design if desired, so there was some repetition), teaching partners (117), school administrators (108 including 39 for those districts that acquired equipment through Midlands Consortium, and 58 assessing satisfaction with courses programs received), teachers and other viewers of staff development programs (80). (The number of survey items in each bank is shown in parentheses, many of the same items are repeated or rephrased as appropriate in different banks.) The item banks were reviewed and edited by the Midlands Consortium Research and Evaluation Committee and are included as **Appendix A** of this report. It is hoped that this instrumentation will be of use to other producers as well. We continue to share this material with those who request it. The three Research and Evaluation Center initiatives described below drew heavily upon the item banks.

Evaluation of the Impact of Midlands Consortium Star Schools Downlink Grants at the District Level

Early in 1989, John Poggio went to Washington, D.C. with Ken McKinley and Connie Lawry from Oklahoma State University to meet with Office of Educational Research and Improvement officials and exchange views with Office of Technology Assessment personnel. One outcome of those discussions was a decision to call together representatives of all four Star Schools Project Consortia and attempt to reach a consensus on the type of evaluative information to be gathered. That meeting took place at the Office of Educational Research and Improvement in Washington, D.C. on May 17, 1989. Representatives of the four 1988 Star Schools grant recipients agreed to gather similar information to document project impact. The Midlands Consortium Research and Evaluation Committee (MCREC) agreed on a standard format for gathering this information. The forms developed for collecting that information are included in **Appendix C**. The results received at the Center for Educational Testing and Evaluation are summarized below. The following information on districts capable of receiving Midlands Consortium courseware during the 1989-90 academic year is offered, in part, as a description of the student population from which the sample of research subjects was recruited. These three states provided the great majority of students who participated in the research studies. For these th ee states, an estimated total of 12,702 school personnel and 156,707 students were potentially affected by Midlands Consortium downlink grants, including a total of 40,141 students eligible for Chapter 1 services, 92,243 eligible for free or reduced price lunches, and 55,518 racial/ethnic minority students.

Tables 1-6 report the results for Oklahoma, Mississippi and Kansas. **Table 1** lists 35 school districts in Oklahoma that received downlink grants in the summer of 1989. The size of these districts ranged from Erick with 14 staff and 44 students to Lawton with 2,218 staff and 17,699 students. The percent of students in a district who were eligible to receive Chapter 1 services ranged from 3% in Inola to 63% in Ardmore City. The percent of students who were eligible for free or subsidized lunches ranged from 7% in Jenks to 60% in Wright. The percent of students in the district who were racial or ethnic minority ranged from zero in three districts to 93% in Bell Elementary School. Most of these 35 districts subscribed to Midlands Consortium courseware or staff development programs. The total number of staff members in these districts was 3,772, which gives an estimate of the number of school staff potentially affected by downlink grants during that year. The total number of students in these 35 districts was 32,984, giving an estimate of the number of Oklahoma students potentially affected by Midlands Consortium downlink grants during that year. On **Table 2**, the percentages of students who were eligible to receive Chapter 1 services, were eligible for free or reduced price lunches, or were racial/ethnic minority (these percentages were provided by school personnel of each district) were converted to numbers and those numbers summed to estimate the number of Oklahoma students in each category potentially affected by Midlands Consortium downlink grants in the first year. The estimated total of students eligible for Chapter 1 services was 4,151, total of students eligible for free or reduced price lunches was 10,940, total of ethnic/racial minority students was 10,617. About 63% of the minority students came from the Lawton district.

Table 3 lists 51 school districts (counting Lee and Carroll twice because they returned reports for each of two buildings) that received downlink grants in Mississippi. Their size ranged from Carroll with 15 staff members and 180 students, to Picayune with 480 staff and 3,939 students. The percent of students in a district who were eligible to receive Chapter 1 services ranged from none at Pillow Academy to 80% at Coahoma. The percent of students who were eligible to receive free or subsidized lunches ranged from none at Pillow Academy to 96% at Anguilla. The percent of students in a district who were racial or ethnic minority ranged from 3% at Pillow Academy to 99.6% at Anguilla. A minimum estimate of the total number of school staff potentially affected by Midlands Consortium downlink grants in the first year, obtained by summing the number of staff member by those districts returning reports was 7,294. A estimate of the number of students potentially affected by Midlands Consortium downlink grants in the first year was 108,230. On **Table 4**, the percentages of students (as estimated by school personnel) in each of the categories which Midlands Consortium was called upon to serve were summed to estimate the number of students affected by downlink grants in Mississippi during the first year. The estimated total of students eligible for Chapter 1 services was 34,182, of students eligible for free or reduced price lunches was 74,336, of racial/ethnic minority students was 44,423.

As shown on **Table 5**, in Kansas, the size of 47 school districts receiving downlink grants ranged from two districts with 15 staff members and 87-90 students to

Anthony-Harper with 82 staff members and 1098 students. The percent of students in a district who were eligible to receive Chapter I services ranged from less than 1% in two districts to 25% in Midway-Denton. The percent of students in a district who were eligible for free or reduced price lunches ranged from 1% in Lewis to 51% in Meade. The percent of racial/ethnic minority students ranged from zero to 37% in Washington. A minimum estimate of the total number of persons potentially affected by Midlands Consortium downlink grants in the first year was 1,636 staff personnel and 16,582 students. On **Table 6**, the percentages furnished by school personnel were converted to numbers. and the estimated total of students eligible for Chapter 1 services potentially affected by Midlands Consortium downlink grants was 1,808; the estimated total of students eligible for free or reduced price lunches was 6,967; and the estimated total of racial/ethnic minority students was 478.

Table 7 pulls together the data from these three states to estimate the total number of school staff and students potentially impacted by Midlands Consortium equipment grants made during the first year. The total number of staff members for the three states was 12,579, the total number of students was 156,707. Of that number the total potentially impacted by Midlands Consortium equipment grants was 40,141 for students eligible for Chapter 1 services; 92,243 students eligible for free or reduced-price lunches; and 55,518 ethnic/racial minority students.

Evaluation of University of Kansas Programming Initiatives: Staff Development by Satellite

Although Kansas State University has been involved with distance education technologies for years, the University of Kansas was relatively new to the field, and had few resources in place when the Star Schools Project began. Few faculty had any experience with the presentation of content via telecommunications technology. So the Star Schools Project was a learning experience for everyone, beginning from square one. One implicit purpose of the staff development by satellite programs offered by the University of Kansas was to make the expertise and resources of faculty and staff accessible to educators in remote rural areas, and to provide opportunities for two-way communication. Production and evaluation personnel continually sought feedback from viewers, using written forms included with program materials, supplemented by some phone interviewing.

Evaluation forms for the University of Kansas' staff development programs were developed by the evaluation team with the assistance and input of the production staff. Samples of these forms for the different programs offered are included in **Appendix B. Table 8** lists subscribers for the staff development by satellite uplinked by the University of Kansas, along with the program name and an estimate of the number of viewers of both the live and the taped programs. The total number of teachers for all the districts (at least for those subscribers who responded to this request for information) was 46,704; the total number of students at those districts was 709,064. The estimated total number of live viewers reported was 1544, the total number of taped viewers reported was 1680. The number of districts served is underestimated by this table, but the total obtained on this table was 354 districts. Most of the districts were rural, with a few large cities including Denver, Orlando and Falls Church.

In the spring of 1989, the University of Kansas uplinked three programs on two topics. COMETS (Career-Oriented Modules to Explore the Teaching of Science) by Dr. Walter Smith provided for two programs that spring and a follow-up program in September. The second offering was a single program on Learning Strategies. Drs. Fran Clark and Keith Lenz were the chief presenters of the Learning Strategies program, which was offered free of charge to acquaint districts with the kinds of assistance available at the Institute for Learning Disabilities at the University of Kansas. The spring 1989 programs were an opportunity to pilot-test equipment and procedures with a small audience. In the fall of 1989, we uplinked programs on "Fearless Math" (Dr. Lelon Capps), Preschool Assessment (Dr. Robert Harrington), and AIDS and Socially Transmitted Diseases (Dr. Phil Huntsinger), along with the final installment of COMETS.

On the basis of the evaluation results available for the spring 1989 and fall 1989 telecasts, it appears that viewers tended to prefer the more prescriptive programs offering concrete rather than general suggestions for teaching. Not surprisingly, presenters with more on-camera or workshop experience got higher ratings, but those presenters who did more than one telecast made rapid improvements in their on-camera presentation skills and became more comfortable with the medium. One unexpected finding, based on an admittedly small number of evaluation forms, was that a large proportion of our audience was made up of school administrators who screen incoming live telecasts, t pe them and decide whether teachers or other staff members should watch the tapes. This complicated the process of getting evaluation forms returned.

During the spring semester of 1990, the University of Kansas offered four staff development series, on the topics of teaching Kansas history, effective school administrators, literacy through literature, and substance abuse. Although school administrators had responded well to previous evaluations, when we aired a series specifically intended for them ("Effective Administrators = School Effectiveness: Definition and measurement for individual growth"), with Dr. George Crawford as the lead presenter, no evaluations were returned.

Each staff development program or series can only do so much; meeting the needs of one type of audience can mean not meeting the needs of other groups. Considerable effort and expense was devoted to alerting the educational community and marketing the telecasts to those for whom it is intended. We are still not matching audience to content as well as we would like, but we have made progress. For example, "Kansas History: Curriculum development for teaching the history of Kansas" with Dr. Rita Napier from the Department of History, had subscribers at 19 sites and evaluations were returned from nine of them. The series was targeted at secondary school teachers faced with the task of teaching Kansas history in the fall because of a new legislative mandate. Reactions from that target group were positive: "very worthwhile"; "a good introduction"; "excellent organization"; "great idea, well done, very interesting"; "I'm happy I participated." The only complaint was that they would have liked more specific ideas for classroom activities or projects. On the other hand, several elementary school teachers also saw the series and complained that "it was too theoretical"; "not useful for lower grades"; "too advanced for first grade"; and even "a waste of time."

The "Schools, Alcohol and Drugs" series with Dr. Diane McDermott as the lead presenter, had 23 sites subscribing and evaluations were returned from nine sites. Several individuals' reactions to this series seemed erratic and full of logical inconsistencies. Over half the evaluations were from administrators. Most said they were satisfied with program content and the presenters were good. Still they doubted they would use any of the information. Some said the program attempted to cover too much information, yet suggested there was not enough "meat." Such evaluations are difficult to interpret, yet informative nonetheless.

"Literacy Through Literature: Books in the Home, the School and the Library" had 51 sites, 20 of which returned evaluations. The major presenters were Dr. Edwyna Gilbert, Associate Professor of English, and Mary Paretsky, Children's Department

Director of the Lawrence Public Library. There were from 1-20 viewers per site and 267 individual evaluations were received. The American Library Association endorsed and helped advertise this workshop. Perhaps this program attempted to reach too broad an audience. A few public librarians said these programs might meet the needs of school librarians but did not help them, while a few school librarians said the opposite. Reading teachers seemed to be the most disaffected audience segment; on the other hand, the parents who viewed the programs and returned evaluation forms said they had learned something useful. The evaluations from librarians in elementary schools in rural areas--the primary target audience--were positive. They only wished for more specifics about book titles. The series was picked up by the school district in the state capital (Topeka) and large school districts in two university towns (Lawrence and Manhattan), and individuals at those three locations were more critical of the series. However, those audiences have access to a wealth of staff development resources that individuals in isolated rural areas do not have. The Lawrence audience filled out longer evaluation forms listing points they had learned from the programs, and the lists were long and comprehensive. So even those big-city viewers who were most critical of the programs absorbed a great deal of content. Although carefully organized and scripted, the presenters somehow got side-tracked during the first of the two programs, so that the second had to be even more tightly scripted and densely content-laden in order to meet series objectives. The second program was more successful instructionally, but several viewers commented that the first program had more life and spontaneity. Finally, whether viewers liked this series or not, the evaluations strongly suggest that these programs caused the viewers to think critically about the issues presented--which may have been the most important objective.

Most of the fall 1990 staff development programs by satellite were presented during the last week of September and first week of October. A two part series was presented, called "Mission Possible: New Orientations for Instrumental Music and Art Programs," with Dr. John Grashel, Professor of Music Education, and Dr. Eugene Harrison, Assistant Professor of Art Education. A three-part series on "Classroom Management" was led by Dr. Steven Lee.

The University of Kansas' most successful series so far in terms of audience response has been "Is There Life After High School?" by Rud and Ann Turnbull from the Beach Center on Families and Disabilities. These three programs were aired at 6:30 instead of 3:30 to enable parents and non-school professionals working with disabled youth to attend. There were 21 subscriptions from 15 states and two Canadian provinces. At several sites, the programs were viewed by groups of 4-20 people, and there were facilitators to encourage discussion and interaction. The purpose of the series was to encourage parents and others working with people with mild, moderate, and severe disabilities to think beyond sheltered workshop settings, plan for the future, have great expectations and strive for successful integration into supported employment settings. Parents who had helped their sons and daughters make a transition from school to work discussed their own experiences by phone and on tape. Examples of successful local programs designed to ease transition of young people with disabilities from school to work settings were discussed, and viewers were given names and addresses of contact persons who could help them start or find similar programs in their areas.

Evaluation responses on the "Life After High School" series were received from 201 individuals, including 120 professionals, 66 family members, one person with a disability and 14 others--including two persons who were both professionals and family members, several college or graduate students, and other types of professionals such as social workers. The responses were positive, for the most part, showing satisfaction with program content, presenters, TV production quality and resource material. Viewers said program content was consistent with the advertising and that the purpose and objectives were clear. As usual, audience members' comments were specific to their individual needs and background in the field. A few professionals said the program did not include much that was new to them, and the information was not specific enough. On the other hand, a family member said, "It was a lot of material for a parent just starting to get involved." Another family member, whose child was only 10 years old, said s/he appreciated being exposed to this information soon enough to begin long-term planning for the child's future. Canadian audience members wished there had been some reference to resources in their country. The presenters' staff at the Beach Center planned to make follow up calls to workshop participants at three, six and twelve month intervals to find out if audience members are making use of what they learned.

To sum up, the University of Kansas set out to achieve a series of prescriptive and developmental objectives via its partnership in the Midlands Consortium. These included:

1) building the equipment, technological and personnel capacity to become and remain a participant in the distance education arena via video signal distribution. Over $50,000 of federal grant and University funds have been and continue to be assigned and used for equipment purchases that directly support our distance learning efforts. And, as a direct consequence of Star Schools funding the campus has maintained the full time employment of a video producer/director and instructional designer.

2) providing experience to campus faculty and staff so that they could be introduced and educated regarding the ways of this 21st century technology. Indeed, the University of Kansas staff development programming utilized at least one faculty person for each of its seven education departments, thereby ensuring controlled exposure to the medium. An additional effort was made to (1) involve personnel from various state agencies as well as individuals from the local community as principle presenters in a number of the offerings, and (2) begin to introduce faculty from the broader campus to this technology. Introduction to and experience with the medium to the broadest possible audience was accomplished.

3) Stimulating and maintaining the commitment of campus administrators to value and rely on the technology as a means of community education for the populations this university serves. The continuing commitment of personnel and resources post-funding clearly reveals this objective has been accomplished.

Evaluation of Courses By Satellite in Mississippi

Part I: Students

To reiterate and expand upon what was said in the introduction to this Evaluation Section, the primary purpose of the evaluation activities conducted at the Center for Educational Testing and Evaluation on behalf of Midlands Consortium was to support investigations of the effectiveness of satellite instruction in general, and secondarily to provide course evaluation information to the instructors. Rather than require that a state member or individual producer be evaluated in a specific manner, it was left up to each entity to avail itself of evaluative service or assistance as desired. To facilitate evaluation efforts, a bank of suitable, diverse items was produced by MCREC and distributed to producers and states to aid the evaluation function. A complete copy of these item banks is included in **Appendix A.** In most respects, the Mississippi Midlands group was the most eager to work with MCREC to design and carry out a thorough evaluation of the impact of satellite instruction in their state. The material and descriptions that follow afford a "case study" that monitors courseware available nationally, but centers on its impact in Mississippi.

For this evaluation, each course has been considered one variant or "treatment level," and findings from individual courses are not identified by name here. The on-air instructors will receive results for their own courses so this evaluation can contribute to the quality of instruction. Before looking at the results for individual courses, it may be useful to get a sense of the results for all students in all courses. Evaluation surveys were completed by 585 students from 65 secondary schools in Mississippi in the spring of 1990. The courses evaluated were Spanish I, originated at Kansas State University, and nine courses originating at Oklahoma State University: German I, Russian, Basic English and Reading, Applied Economics, AP American Government, AP Chemistry, AP Physics, AP Calculus, and Trigonometry. There were no student results for German II. The 186 pages of tables for Courses 1-11 which have been constructed by the Center for Educational Testing and Evaluation for the Office of Distance Learning at the University of Mississippi will not be included in this report, but will be available from the Center for Educational Testing and Evaluation. Instead, results are summarized in five tables and 20 figures described and referred to below. **Table 9** summarizes results on selected items and student characteristics so as to facilitate comparisons among courses, and comparisons of individual courses with the average for all students in all courses in the far right column. **Table 10** shows the results on all items for all students.

The student population participating in this evaluation was approximately 38% male, 62% female; 57% minority, 43% white. The largest minority group was African Americans with 305 students. There were fourteen Hispanics, six American Indians, and four Asian/Pacific Islanders. One student was in sixth grade, 49 in seventh, 26 in eighth, two in ninth, 45 in tenth, 48 in eleventh and 110 in twelfth, while 304 did not fill in their grade. Obviously, these courses by satellite are providing opportunities in mathematics, sciences and foreign languages, not only to a large number of minority students, but also to many female students who would not otherwise have had access to such instruction. The average proportion of minority enrollment across all classes was 57%. Minority enrollment in the foreign language and social science classes averaged more than one-third. Nearly half of the mathematics students and nearly 60% of the science students reported themselves to be ethnic/racial minority. Two of the three language classes were predominantly female, but females were also in the majority in the mathematics and sciences classes.

The profile that emerges for Mississippi is a cohort of motivated, largely confident and able students ready for learning. The point to be underscored is that the technology introduced by Midlands Consortium extended educational opportunity to those capable and deserving individuals.

On **Figures 1-20**, the marks on the horizontal axis represent the ten courses included in this evaluation (all the Midlands Consortium courses except German II) numbered from 1-10 in the order in which they are discussed in this **Evaluation** section. The first mark being Course 1, the second being Course 2, and so on. Columns centered on the eleventh mark on the far right side of each graph show responses on each item for all students in all courses.

Parental educational levels are sometimes used as a rough estimate of socio-economic status and cultural background. As **Figures 1 and 2** show, the relative distribution of parental educational levels varied considerably among courses, and give some indication of how much help parents were able to provide their children at home. As

Table 10 indicates, for the mothers, 26% did not finish high school, 56% graduated from high school, 14% had some college and 29% were college graduates. For the fathers, 28% did not finish high school, 57% were high school graduates, 13% had some college and 31% were college graduates. English was the only language in approximately 90% of the homes. (For some reason, there was good deal of missing data on this question in some courses, but it is possible to conclude that this student population included only a small number of students for whom English is a second language.)

Students were motivated to take these courses by interest (29%), to prepare for college (33%), because there was nothing else they wanted to take (6%), someone persuaded them to take the course (11%) and "other" (22%). There were wide differences among courses in students' primary motivation for taking each course, as indicated by **Figure 3**. The persons most responsible for their taking the courses were themselves (43%), family (5%), an administrator or counselor (35%), a teacher (12%) or other students (4%). It is important to reflect on the motivation of students in courses offered. Researchers have found that students who take a course out of interest tend to do more work and reading than is required, relate what they learn in one class to what they learn in other classes and to the world beyond the classroom. Their learning is generally deeper and more lasting than that of students with other types of motivation. Students with more instrumental motivation--"to prepare for college or career"--tend to concentrate more on formalistic participation in the course, completing the syllabus and fulfilling requirements so they can get a good grade, but not necessarily doing additional reading or thinking to get more deeply into the subject matter, connecting it to what they already know or retaining it beyond the final exam. Students whose motivations are more extrinsic, for example, "Someone persuaded me" or "There was no other course I wanted to take," tend to participate in the course at a more superficial level, attempting to meet minimum performance standards in order to get a passing grade--not necessarily a good grade. They often evaluate courses differently than students who bring other types of motivations to the learning experience, and they tend to give more negative feedback. If they do not expect to use what they learn in the future and are not particularly interested in the subject for its own sake, there is little incentive for them to strive for understanding or long-term retention.

As **Table 10** indicates, while 40% of all students reported themselves to be among the best in their high school class, 20% said they were above average, 36% average, 3% below average. **Figure 4** shows how the courses vary in including students of different ranks in their graduating classes. Course 5 included no students who said they were average or below average, while over 70% of the students in Course 1 said they were average or below average. When students in all courses do well in a course, 51% said it was because they worked hard, 29% because they were good in that subject, 12% because it was an easy course, and 7% because they were lucky. When students do poorly, 66% of these students said it was because they did not work hard enough, 10% because they were not good in that subject, 19% because it was a difficult course, 5% because of bad luck. **Figure 5** shows what proportion of students in each course attributed academic success to internal causes, and what proportion attributed not doing well in a course to internal causes. Across all courses, only 14% agreed that luck is more important than hard work, while 52% disagreed.

As **Figure 6** shows, a very high proportion of students taking these courses by satellite were planning to attend college. As shown in the far right hand column on **Figure 6**, across all courses, 85% of these students planned to attend college, and 32% said they needed the satellite course they were taking for college. While 47% said they would be confident about taking the same course in college, only 29% would be confident about taking the next level course in college. Responses on these two questions varied considerably by course, as shown by **Figure 7**. Most students were very certain about their ability, for example 31% said they had among the best ability to complete college, and 66% said they had above average ability for completing college. **Figure 8** permits a rough estimate of the difficulty of the satellite courses as compared to what these students were used to experiencing. While a large percentage of the students typically get A's in all their classes, a much smaller percentage expected to get an A in their satellite courses. Twenty percent thought they did excellent work, 50% said good, 25% average. Most expected a lower grade in the satellite course than they usually get, but only 4% expected to fail. Few students were studying excessively for their satellite courses: 55% studied less than two hours per week, 26% two to three hours, 13% four to five hours. Only 23% of all students said these courses expect too much self-motivation, 23% too much study skill, and 28% too much memorization; about 50% said the courses were about right in their expectations.

Table 9 was constructed to give readers a sense of typical vs. atypical results across all courses. As one would expect, students were less satisfied with the pacing (too fast or too slow) of courses being taught by satellite for the first time last year. **Figure 9** shows students' evaluations of the pacing of instruction. There was little indication that they were attracted by the novelty of satellite courses, since most said they would have taken the course even if it had not been taught by satellite. Three items asking for students' reactions to satellite instruction, whether (1) the broadcasts held their attention, (2) they prefer satellite to a regular course, (3) they would take another satellite course, are depicted on **Figure 10.** Few students said they preferred a course by satellite to a regular course, but some said the broadcasts made the course more interesting. There was a good deal of variation on the item asking whether students would take another course by satellite.

Figure 11 summarizes the results of three items which asked students to evaluate the interactive component of each course, and the average results for students in all courses are found in the far right column. In other words, **Figure 11** shows students' reactions to problems endemic to distance learning: discomfort with calling in, disappointment with the amount of communication with the instructor, and trouble getting questions answered. Students' views about testing and grading in each of the ten courses are summarized on **Figure 12.** The items represent three aspects of good testing policy. The first column on **Figure 12** depicts an item asking students if they received adequate guidance before the test so that studying and taking the exam became a learning experience, not merely a sorting exercise to assign a grade. The second column concerns another aspect of good testing policy, whether students were able to learn from their mistakes on tests. The third column shows whether students agreed the grading system was fair. Courses by satellite which had been taught before last year tended to get higher ratings on the fairness item, but there were notable exceptions. Most students do seem to have appreciated the opportunity to take these courses, especially those subjects which would have been inaccessible otherwise. **Figure 13** depicts three items asking students to evaluate their own learning in each course: how much did they learn compared to their expectations, how much they learned from the computer drills, and how much they learned from tests. Courses 5 and 6 had no computer component, so the middle column is missing for those two courses.

Figure 14 depicts three items asking students to evaluate the difficulty and homework demands of that course by satellite as compared to the same course without satellite (or what they believe such a course would be like). **Figure 14** includes the item asking students if they expected more computer work, and items asking students if they believed the satellite class was harder and required more homework. **Figure 15** includes the three items on whether the satellite course expected too much self-motivation, study skill, or memorization.

Some satellite instructors see their courses as providing an extended staff development program for local teachers. They fully expect the teaching partners to use the satellite course as a preparation for teaching the course by themselves in the second or third year. **Figure 16** shows the extent to which students saw the satellite courses as a modeling different teaching methods and giving their teachers some new ideas they could use in their other classes. **Figure 17** shows the extent to which students saw each course as an opportunity: (a) for high ability students to take a more challenging course, (b) to learn the latest technology, and (c) to get a preview of college work.

Figure 18 shows three items seeking summative evaluations of the course. Column 1 shows results for the item asking whether students would unreservedly recommend the course to other students. Column 2 shows what percentage of students were considering further study of this subject. Column 3 shows the percentage who agreed they were fortunate to get to take this course at all. Courses 9 and 10 were at a disadvantage on that item because some schools subscribed to those courses to fulfill their contractual obligation to take at least one course, not because there was no other way they could teach those subjects.

Figure 19 summarizes information from an item asking students how often they used computer software. In some courses, computer-assisted instruction was a major component, and this is obvious when larger percentages of students said they used the software at least once a week. **Figure 20** gives some indication of how often students reported calling in during (on-air) or between (off-air) televised programs. The level of interaction chosen for depiction here was calling in at least once a month.

The sections that immediately follow present evaluation results for each of the ten Midlands Consortium courses evaluated by students in Mississippi. The focus on Mississippi was a consequence of having ready access to classrooms because of the support and endorsement of the Office of Distance Learning at the University of Mississippi. Unfortunately, funding levels made it impractical for the MCREC group to attempt to secure additional, comparable data from other state sites. Nonetheless, the Mississippi state data offer a realistic, useful and important view of the impact of learning opportunity on our nation's youth.

We have deliberately chosen not to identify courses by subject and instructor. Our primary objective is not to evaluate a particular course; but rather to assess the impact of distance learning. Ten courses do offer a sufficient number of replicates for the reader to formulate a view of the impact of satellite instruction.

Most of the results reported below for each course are simple frequencies--showing what percent of students gave which possible response to each of the questions posed. Frequencies alone do not tell us whether that answer was unusual or typical for satellite courses. In order to see if the average response for students in a particular course was unusually high or low compared to the mean response for students in all the other courses by satellite, a series of analyses of variance were used to compare the differences between means. Students in the course under consideration were assigned to one group and all other students to another group. Then, using some of the Likert-response evaluative items as dependent variables, analyses of variance compared the mean responses for the two groups to see if results for that course were sufficiently extreme to suggest that result was not a chance occurrence. The smaller the value of p, the more extreme the result and the less likely it was a chance occurrence attributable to sampling fluctuations. Findings by course follow.

Course 1

Ninety percent of the students in Course 1 were racial or ethnic minority; 40% were male and 60% were female. Forty-one percent of the mothers had not finished high school, while 14% were college graduates; 32% of the fathers did not finish high school, while 19% were college graduates. English was the only language in 83% of these students' homes. Ten percent of these students said they were among the best, 14% said they were above average, 63% said they were average, and 10% said they were below average in their graduating class. Sixty-one percent of these students said they planned to attend college, and 26% said they needed this course for college.

Thirteen percent enrolled out of interest, 18% said they took this class to prepare for college, and 57% took it for other reasons. Twenty percent said enrolling was their own decision, 42% said a teacher or counselor was most responsible, and 24% said a teacher was most responsible. When they do well in a class, 46% said it was because they worked hard, 21% because they are good in that subject, 16% because it was an easy course and 13% because they were lucky. When they do poorly in a course, 61% said it was because they did not work hard enough, 11% because they are not good in that subject, 16% because it was a difficult course, and 9% because of bad luck. Thirty-four percent agreed that luck is more important than work in accounting for academic success. Compared to the other satellite courses, students in this course assigned a larger role to external causes: course difficulty and luck. Of the ten courses being considered here, this is the only one in which a critical mass (over one-third) of the students attributed academic success or failure to luck. That suggests they have more difficulty believing that their efforts to learn or achieve will make much of a difference. Therefore, they take less responsibility for their own learning or achievement.

Decisions on pacing are difficult even in conventional teaching situations, and are especially so in a first-year satellite course. Just over half agreed that it was too easy to fall behind individually, while 29% said their whole class had trouble keeping up, and 38% agreed that this course attempted to cover too much material. Students' opinions of testing practices were assessed with three questions: 59% agreed they were given enough guidance in preparing for tests and were able to learn from their mistakes on tests, and 57% agreed the grading system was fair.

Computer-assisted instruction was an important component of this course, and 66% of the students agreed that they had learned from the computer drills, while 58% said there was less computer use than they expected. While 16% said they had never used the software, 6% said they had used it once a month, 12% two or three times a month, 15% once a week, and 46% two or three times a week.

Students expected to get better grades in this course than they typically receive, and this course was unique in that respect. Over half (58%) said they studied less than two hours per week for this course, while another 30% studied from two to five hours. Only 16% said this course required too much self-motivation, 13% said it expected too much study skill, and 16% too much memorization. On each of those questions, about two-thirds chose the answer "about right." Over two-thirds were quite satisfied with how much they had learned.

Nine percent said they had called in a question during the broadcasts once a week, 18% once a month, 14% two or three times a month, a total of 16% at least once a week, 46% never. The proportions were very similar for calls at other times of the school day. Only 21% agreed that they felt uncomfortable about calling while nearly 44% disagreed.

Students in this course were statistically different from students in the other satellite courses on several items. They were more likely to report difficulty paying attention to the broadcasts ($p < .001$). However, they were more likely to say they preferred instruction by satellite to a regular class ($p < .001$), and that the broadcasts made the course more interesting ($p < .05$). They were more likely to agree that this course attempted to cover too much material ($p < .05$), but less likely to agree with the statement, "I thought we would go slower and learn more" than students in the other classes ($p < .05$). They were less likely to say they were uncomfortable about calling during the live broadcasts ($p < .001$). They were less likely to agree that their teaching partners maintained order ($p < .001$).

Course 1 attracted a different student population than the other courses: a larger percentage of students who said they were of average or below-average rank in their graduating class, and a smaller percentage who said they were planning to go to college. The pattern of motivations or reasons for taking this course (shown on **Figure 3**) show a large proportion of students who chose an extrinsic motivation, and small proportions choosing either the interest or instrumental motivations. Typically, students with less intrinsic motivation are more difficult to teach. While the patterns for internal attribution (shown on **Figure 5**) were not unusual, in this course, an unusually large proportion of students said that luck is more important than hard work for success. External attributions are often associated with a lower level of effort or an inconsistent level of effort. Persons of any age who have come to believe that their efforts contribute little to their success or failure in life naturally become discouraged more easily than those who have come to believe that their efforts will pay off. These attributional patterns are acquired over a long period of time and no single course is likely to change them very much.

Especially considering the student composition of this course, the instructional staff can claim several important successes. Students who were low in self-confidence were made to feel quite comfortable about calling the instructor(s). **Figure 11** shows that the column for "uncomfortable about calling" for Course 1 (far left side) is lower than the average (far right). This was the only one of the ten courses in which students expected to get a higher grade than they usually get. But this was not considered an easy or undemanding course. For example, over half said it was easy to fall behind. The computer-assisted instruction component of this course was very well received. **Figure 13** shows a large proportion of students in this class agreed they had learned a lot form the computer drills. Ironically, **Figure 14** shows that students expected more computer work in this class, but the phrasing of the question does not allow us to determine whether they were disappointed or pleasantly surprised, only that the course differed from their expectations. Students in this class were statistically more likely to say they preferred instruction by satellite to a regular class (which constitutes a rousing endorsement) and that the broadcasts made the class more interesting.

Course 2

For this course, 65% of the students who responded to the survey were white, 32% African American, and 3% were Hispanic; 40% male 60% female. Students were asked about the extent of their parents' education. Thirty-five percent of these students' mothers were college graduates. Another 33% had mothers who were high school graduates, while 21% did not finish high school. Thirty-nine percent of the fathers graduated from college, 30% graduated from high school, 24% did not finish high school. Ninety-five percent came from homes where English is the only language.

Students' primary motive for taking the course were interest (46%), to prepare for college or a career (18%), because there was nothing else they wanted to take (8%), someone persuaded them to take it (19%), or "other" (10%). When asked who was most responsible for their taking this course, 60% said it was their decision, while 5% said their parents or family had been most responsible, 29% said an administrator or guidance counselor had influenced them. Asked how they ranked in their graduating class, 43% said they were "among the best," 26% "above average," 30% "average," and 1% "below average."

When these students do well in a course, they say it is because: (1) they worked hard (57%); (2) they were good at that subject (28%); (3) it was an easy course (11%); (4) they were lucky (4%). Therefore, 85% attributed their success to internal causes. When these students do poorly in a course, they attributed that to: (1) not working hard enough (80%); (2) not being good in that subject (4%); (3) course difficulty (10%); (4) bad luck (6%). So 84% attributed poor performance to internal causes. Only 10% agreed that good luck is more important than hard work for success, while 83% disagreed.

Most students (61%) said they would have taken this course even if it had not been a satellite class, 19% said they would not and 20% were not sure. Almost 90% planned to attend college; 53% needed this course for college, while 46% did not.

Instructional decisions about how much material can or should be covered are difficult even in face-to-face classrooms. In this satellite course, 53% disagreed that this course attempted to cover too much material, while 27% agreed to some extent. Many students (46%) felt they were given guidance on preparing for tests, while 21% were neutral and 25% disagreed. Students were quite positive about the computer drills--79% said they had learned a lot from them. Seventy-five percent said teachers maintained order. About one-third said they felt some lack of support by agreeing there was "no one to help you," while 42% disagreed with that statement. Almost three-fourths agreed that the grades were fair, only 11% disagreed.

Only 15% indicated they felt uncomfortable about calling. While 54% had never called during the broadcast, 28% called once a month, 13% at least two or three times a month.

Seventy-two percent said they used the software two or three times a week and another 14% said they used it once a week. **Figure 19** shows weekly use of software in this course and allows comparisons with the other satellite courses.

Students were not devoting excessive time to studying for this course--59% said they studied less than two hours per week. Students expected somewhat lower grades in this course than they typically get. Thirty-six percent would recommend the course to other students, 43% said it would depend on the student. Only 19% said this course expected too much self-motivation from the student, 23% too much study skill, and 32% too much memorization.

The means for students in this course were compared to the means for all other Mississippi satellite students on specific items. Sometimes the differences were statistically significant but hard to explain, except perhaps by differences in enrollment among courses. And herein may be a key finding: each course attracts truly different types of students. The technology provides opportunities to a diverse population, not a homogeneous collection of (the academically able, the upwardly mobile, the goal-oriented, etc.) students. In this class students were more likely to agree with the statement, "There is no one to help you" ($p < .05$) than students in all other courses. Students in this course were statistically more likely to say the grading system was fair ($p < .05$). And they were statistically more likely to say they had learned a lot from the computer drills ($p < .001$).

Results for this course are found at the second mark from the left on **Figures 1-20**. As **Figure 8** shows, many students who said they are capable of getting A's in most of their courses did not expect to get an A in this course, and **Figure 14** shows a slightly above average percentage of these students said this satellite course was harder than a regular class. **Figure 13** shows a large proportion of students in this class agreed they had learned a lot form the computer drills. **Figure 11** suggests that the instructor(s) and instructional staff of this course have done an outstanding job of making students feel comfortable about calling--only 15% said they felt uncomfortable. A rather high percentage of students said they expected more communication with the instructor(s). However, this perception should be seen as relative not absolute--a low percentage on this item might suggest that students were not enthused about the possibility of communicating with the instructor(s) and were therefore not disappointed, while a high percentage might suggest students saw communication with the instructor(s) as a treat and therefore wished there could have been more communication. **Figure 12** shows that a large proportion of students in this course were impressed with the fairness of the grading system. These students agreed that this course by satellite offered an opportunity to take challenging work and preview college work, as shown by **Figure 17**.

Course 3

The students taking this course were 54% male and 46% female. Their mothers had various levels of education: 29% college graduates, 29% started college, 21% were high school graduates, and 21% did not finish high school; 21% of the fathers were college graduates, 29% started college, 21% were high school graduates, 29% did not finish high school. Half the students took the course out of interest, only 7% to prepare for college or career and an equal proportion for "There was no other course I wanted to take" and "Someone persuaded me to take it." "Other" reasons accounted for 29% of the students' motivations for enrolling. While 29% decided on their own to take this course, 57% were influenced by an administrator or counselor, and 14% by a teacher. All students in this course reported they were at least average rank in their graduating class; 71% said they were among the best and another 14% said they were above average. The two kinds of internal attribution for success in a course accounted for 93% of these students; internal attributions for failure accounted for 71%. Another question measuring student attribution asked if they agreed that luck was more important than work for success, and 57% of students in this course strongly disagreed. All of these students (100%) planned to go to college.

This course was being taught for the first time, and the instructor(s) decided to make the second semester considerably more demanding and fast-paced than the first. So the item on whether the course attempted to cover too much material was particularly interesting, and 57% indicated some agreement, split half and half between strongly agree and agree, with an equal number neither agreeing nor disagreeing. Another question asked students to agree or disagree with the statement: "I thought we would go slower and learn more," and 79% agreed to some extent. Some 43% agreed it was too easy to fall behind, while just 29% agreed that their whole class could not keep up with the TV instructor. Only 21% felt they had adequate guidance in preparing for tests, while 29% said they were able to learn from their mistakes on tests. However 71% agreed that the grading system was fair. Testing practices and decisions on how much material to cover at what speed will be areas for improvement in subsequent years, but there was little evidence of deep or widespread dissatisfaction during the first year. Less than half of these students (43%)

said this satellite course was harder and required more homework than one with a conventional teacher only and no televised instruction.

Students in this course were particularly positive about the computer-assisted instructional component, a total of 93% said they learned a lot from the computer drills. The software for this course was heavily used: 57% said they used the software two or three times a week, 29% at least once a week. **Figure 13** shows a large proportion of students in this class agreed they had learned a lot form the computer drills. **Figure 19** shows weekly use of software in this course and allows comparisons with the other satellite courses.

There were several questions posed dealing with frequency of interaction by phone: 57% said they had never called in a question during the broadcasts, 28% from one to three times a month and 14% at least once a week. Half had never called in a question at other times during the school day, 28% at least once a month and 21% from one to three times a week. Almost 43% agreed they were uncomfortable about calling.

Students in this class were statistically less likely to agree that the broadcasts usually held their attention ($p < .001$), and less likely to agree that the broadcasts made the course more interesting ($p < 001$). They were more likely to agree that this course attempted to cover too much material ($p < .01$), and more likely to agree with the statement, "I thought we would go slower and learn more." Students were less satisfied with the testing practices in this course: less likely to agree they were given adequate guidance toward preparing for tests ($p < .01$) and that they were able to learn from their mistakes on tests ($p < .001$). However, the computer work was an outstanding component of this course, with nearly all students strongly agreeing that they learned a lot from the computer drills ($p < .01$). It is clear that the classes are not replicates of each other. Each course, so to speak, has its own personality.

Results for this course are shown near the third mark from the left on **Figures 1-20**. Compared to Courses 2 and 4 on **Figure 3**, a slightly larger proportion of these students were motivated by interest in the subject matter, and a much lower proportion were motivated by the need to prepare for college. Again, compared to Courses 2 and 4, on **Figure 4**, a much larger proportion were among the best in their graduating class. All planned to attend college. Few expected to get an A in this course, even though they usually get A's (see **Figure 8**). Nevertheless, students in this course were favorably impressed with the fairness of the grading system (see **Figure 12**). A very high proportion of students in this class said they would take another course by satellite (see **Figure 10**), which to some degree can be considered a favorable reflection upon this course. A relatively small percentage agreed they had trouble getting answers (see **Figure 11**), which might be considered evidence of a good instructional support system. Although these students did not agree that this course by satellite was harder than a non-satellite course (see **Figure 14**), of all the courses, they were the most likely to agree this course required too much self-motivation and too much memorization, as shown by **Figure 15**. These students agreed that this course by satellite offered an opportunity to take challenging work and preview college work, as shown by **Figure 17**. Finally, the instructor(s) in this course should be pleased to see how many students said they learned as much as they expected (as shown by **Figure 13**).

Course 4

Half the students taking this course were white, 48% African American and the remaining students other racial or ethnic minorities. One-third of the students were male, two-thirds were female. Half these students' mothers had high school or less, 31% were college graduates; 27% of the fathers had high school or less, while 31% of the fathers were college graduates. English was the only language spoken at home for 93% of these students.

Thirty-eight percent of the students said they were among the best in their graduating class, while another 24% said they were above average and 35% average. Ninety-one percent said they planned to attend college; 35% said they needed this particular course for college, while 46% did not.

While 41% said they took this course out of interest, 38% said they took it to prepare for college. Most students (57%) reported it was their own decision to take this course, while 28% were influenced by an administrator or counselor. When these students do well in a course, 50% said it is because they worked hard, 33% because they are good in that subject. When these students do poorly in a course, 65% say it is because they did not work hard enough, while 11% say it is because they are not good in that subject. Twice as many attributed doing poorly to course difficulty as attributed doing well to the course's being easy. Eighty-six percent disagreed that luck is more important than work.

Twenty-six percent agreed this course tried to cover to much material while almost 50% disagreed. Two-thirds of these students agreed they were given enough guidance in preparing for tests and that they were able to learn from their mistakes on tests. Almost half said it was too easy to fall behind in this course, but just 23% said their whole class had trouble keeping up with the TV instructor. While 29% said this course was harder than a non-satellite course in the same subject, 22% said it required more homework. Sixty-one percent of these students said they studied less than two hours per week, while 26% said they studied from two to three hours.

The computer drills were less emphasized in this class than in the two just discussed; 44% agreed that they learned from the computer drills, while 48% said they had expected more use of computers. Six percent used the software two or three times a week, 12% once a week, 26% two or three times a month, 27% once a month and 21% never.

One-third said they had never called with a question during the broadcasts, another third had called in once a month, a total of 21% said they had called more frequently than that. Some discomfort about calling was expressed by 42%.

Students in this class were statistically less likely to say this course attempted to cover too much material ($p < .001$); more likely to say they received adequate guidance to help them prepare for tests ($p < .01$) and that they were able to learn from their mistakes on tests ($p < .01$). They were less likely to say it is too easy to fall behind in this subject ($p < .05$); but more likely to say their whole class had trouble keeping up ($p < .01$). They were less likely to agree that they learned from the computer drills ($p < .001$). They were statistically less likely to agree that "There is no one to help you" ($p < .01$).

Results for students in Course 4 are found at the fourth mark from the left on **Figures 1-20**. This group of students was more confident about taking the same level course in college than students in Courses 2 and 3, but no more confident about going on to the next level in college. More of the students who typically get A's expected an A in this course than in Course 3 where the disparity was particularly striking. **Figure 13** indicates that students felt the tests were valuable as a learning experience. **Figure 20** shows that students in Course 4 made most intensive use of phone interaction of all ten courses. Still, as indicted by **Figure 11**, students in this course also said they expected

Agreement with the statement, "I thought we would go slower and learn more," was at the 53% level. Compared to a regular class without satellite instruction, 47% said this satellite class was harder and had more homework. Most students were quite satisfied with their learning: 53% said they had learned a great deal, 29% about as much as they expected. Eighty-two percent said they were given adequate guidance on how to prepare for tests, 94% said they were able to learn from their mistakes on tests, and 82% said the grading system was fair. Over half reported spending less than two hours a week studying outside class (53%), while 24% reported two to three hours and 24% more than three hours.

While 18% said they had never called in a question during the broadcasts, 29% said they had called about once a month, 24% two or three times a month and 29% at least once a week. At other times of the school day, 29% had never called, 24% once a month, 18% two or three times a month and 29% at least once a week. Only 12% said they had had trouble getting questions answered. And 29% agreed they were uncomfortable about calling.

Students in this course were statistically more likely to agree that the broadcasts made the course more interesting ($p < .05$), that they were able to learn from their mistakes on tests ($p < .05$) than students in the other courses. They were less likely to agree that they had trouble getting their questions answered ($p < .001$). Their teaching partners were statistically more likely to maintain order ($p < .01$), but this was a rather small and highly select group of students. Students in this course were statistically more likely to strongly agree that the grading system was fair ($p < .01$), and that they were fortunate to get to see and hear such fine instructors. The composite image is a difficult challenging course that very able students were able and grateful to have an opportunity to experience.

As **Figure 8** shows, a tiny proportion of these students were expecting an A in this course. **Figure 10** indicates a very large proportion of students in Course 5 said the broadcasts held their attention, and a large proportion said they would take another satellite course. **Figure 12** shows that students were especially well satisfied with the testing and grading practices in this course, with the highest proportion of any course saying they were able to learn from their mistakes on tests. As mentioned earlier, some of the satellite instructors see their courses as providing an extended staff development program for local teachers. They fully expect the teaching partners to use the satellite course as a preparation for teaching the course by themselves in the second or third year. **Figure 16** shows the extent to which students saw the satellite courses as a modeling different teaching methods and giving teachers new ideas they could use in their other classes. Apparently Course 5 was particularly successful in achieving that objective. A very large proportion of these students said learned as much as they expected, and would unequivocably recommend this course. **Figure 17** shows that Course 5 was particularly valued as an opportunity to take challenging college-level work.

Course 6

There was some missing data, but approximately 65% of the students in this course were female. This group of students was 20% African American and 80% white. Only 10% of the mothers did not finish high school, while 55% were college graduates. While 15% of the fathers did not finish high school, 70% were college graduates. Five percent said they took the course out of interest, 90% to prepare for college, and 5% because there was nothing else they wanted to take. Administrators and counselors played no role in recruiting for this course: 65% said it was their own decision, 30% said a teacher had encouraged them and 5% said their families had encouraged them to take it. Eighty-four percent of these students said they are among the best in their class.

When these students do well in a course, 60% said it was because they worked hard, while 40% said it was because they are good in that subject. Thus, internal attributions of ability and effort are seen to account for success. However, when students do poorly in a course, 35% attribute that to course difficulty, 5% say it was because they are not good in that subject, and 60% said it was because they did not work hard enough. Eighty percent disagreed that luck was more important than work.

All students responding to this evaluation said they planned to attend college, 20% said they needed this course for college. Sixty-five percent agreed they would be confident about taking the same course in college and 15% disagreed; 40% agreed they would be confident about taking the next level course in college, while 40% disagreed. Seventy percent were considering further study of this subject.

Since this was one of the advanced placement courses, items concerning students' confidence about college study of the subject were especially relevant. While a majority of the students apparently considered this course successful as a college preparatory course, a smaller percentage saw it as a being equivalent to a college course. Even though students apparently took this course more for college practice than college credit, it is encouraging to note that 70% planned further study of the subject--the highest for any of the ten courses. The course was difficult and the experience might have been somewhat humbling for some of these students, but it did not sour them on the subject.

A total of 35% agreed that this course attempted to cover to much material, an equal number disagreed. A total of 60% agreed that it is too easy to fall behind in this course, while half that number disagreed. However, only 20% agreed that their whole class had trouble keeping up. And 55% agreed with the statement, "I thought we would go slower and learn more." Sixty percent thought the satellite course was harder than a course with a local teacher would have been, while 25% thought the regular course would have been about the same. Thirty-five percent thought the satellite class had more homework than a regular course, while 50% thought they were about the same. Students were asked how much they had learned compared to their expectations: 30% said they had learned a great deal and 40% said they had learned as much as they expected. Approximately 30% were disappointed with their learning. Forty percent said they studied less than two hours a week for this course, another 40% studied two to three hours, 15% four to five hours and 5% more than that.

Sixty-five percent said they had received adequate guidance to prepare for tests and had been able to learn from their mistakes on tests, with just 10% disagreeing on both items. Only 5% thought the grading system was unfair, while 85% said it was fair.

The frequency and importance of phone interactions varies considerably among courses by satellite. In this course, 55% of the students had never called in during the broadcast, 25% had called in once a month, 15% two or three times a month and 15% two or three times a week. At other times of the school day, 70% had never called, 15% once a month, and 10% more often than that. Half agreed they felt uncomfortable about calling, while 40% agreed they had trouble getting questions answered.

While all said they typically get A's in their courses, only 60% were expecting an A in this course, while 30% were expecting a B. Three quarters were very certain of their ability; 80% said they judged their own work to be good, while just 10% believed their work was excellent. Eighty percent said their ability to complete college was among the best, while 15% said above average and 5% average. Half strongly agreed and another 40% agreed that this course was an opportunity for high ability students to take more challenging work. One quarter said this course expected too much self-motivation, 30% too much study skill, 35% too much memorization.

Students in this course were statistically less likely to agree that the broadcasts made the course more interesting ($p < .05$), but they were also statistically less likely to agree with the statement, "There is no one to help you" ($p < .01$). In other words, students felt there was a good support system to help them learn in this course.

Figures 1-2 show a larger proportion of college-educated parents in Courses 5 and 6. Most of the students in Courses 5-8 were among the best in their graduating class (see **Figure 4**). Students in Course 5 and 6 were overwhelmingly motivated by the need or desire to prepare for college, very few by an interest in the subject. **Figure 6** shows that all (100%) the students in Courses 5-7 were planning to attend college. A result specific to Course 6 is the above-average proportion of students who said they would be confident about taking the next level course in college (shown **Figure 7**). As shown by **Figure 13**, a large proportion of these students said they learned as much as they expected. **Figure 18** shows that a large proportion would unequivocably recommend this course to other students, and were planning further study of this subject.

As mentioned earlier, some of the satellite instructors see their courses as providing an extended staff development opportunity for local teachers. They fully expect the teaching partners to use the satellite course as a preparation for teaching the course by themselves in the second or third year. **Figure 16** shows the extent to which students saw the satellite courses as a modeling different teaching methods and giving their teachers new ideas they could use in their other courses. **Figure 16** suggests that Course 6 was particularly successful in achieving this objective. **Figure 17** shows this class was especially valued as a preview of college work.

A comparison of Courses 5 and 6 reveals comparable groups being served by very differently-perceived classes. Embodied in this comparison is the realization of access to diverse offerings and a recognition that all satellite courses are by no means the same.

Course 7

Almost one-third of the students in this course were racial-ethnic minority, while two-thirds were white. Fifty-two percent of these students were female. Nine percent of the mothers did not finish high school, while 27% were college graduates; 29% of the fathers had not finished high school while 27% were college graduates. English was the only language in 93% of the homes.

Compared to the satellite courses discussed earlier (see **Figure 3**), more students took this class because there was no other course they wanted to take ("extrinsic motivation"), while 27% took it out of interest and 46% took it to prepare for college. Compared to previous courses discussed, more students reported that a teacher had encouraged them to take this course (36%), while 23% said an administrator or guidance counselor was most responsible and 36% said it was their own decision. Eighty-two percent said they were among the best in their graduating class.

When these students do well in a course, 41% said it was because they worked hard, 46% because they are good in that subject. When they do poorly, 64% said it was because they did not work hard enough and 18% because they are not good in that subject. Ninety-five percent disagreed that luck is more important than work in explaining academic success. All (100%) planned to attend college, but only 14% said they needed this particular course for college. **Figure 6** shows how this course compares to the others.

About 46% said this course attempted to cover too much material, while 91% agreed it was too easy to fall behind individually. But just 50% agreed that their whole class had trouble keeping up with the TV instructor. Exactly half agreed there was adequate guidance to help them prepare for tests, and 55% agreed they had been able to learn from their mistakes on tests. Compared to courses discussed so far, more students thought this satellite course was harder, 77% thought it had more homework than the same course, non-satellite. Half said they studied less than two hours per week, 36% two to three hours, and 14% more than that.

This was one of the advanced placement courses, so the questions on students' confidence about college study in this subject are of particular interest: 59% agreed they would feel confident in taking the same course in college, 32% would be confident about taking the next level course in college, and 59% would consider further study of this subject.

Twenty-seven percent said they learned from the computer drills, 63% said they had expected more computer use in this course. A majority (59%) had only used the software once a month, 18% two or three times a month, 14% from one to three times a week.

Several questions concerned the interactive component of this course: 41% said they had called in a question during the broadcasts about once a month, 14% once a month, a total of 18% called in at least once a week, 14% once a month, and 27% never. Half had never called in a question at other times during the school day, 18% once a month, 18% once a week, 9% two or three times a month. Thirty-six percent agreed they were uncomfortable about calling.

Results for Course 7 are found near the seventh mark from the left on **Figures 1-20. Figure 3** shows that more of these students were motivated to take the course by interest in the subject matter than was the case for Courses 5 and 6. **Figure 9** suggests that an unusually large proportion of students agreed it was too easy to fall behind in this course. A large proportion said the broadcasts held their attention, as indicated by **Figure 10**. A large proportion of students agreed that the broadcasts held their attention, as shown by **Figure 10. Figure 12** suggests that students in Course 7 were favorably impressed by the fairness of the grading system. **Figure 13** indicates a large proportion would definitely recommend this course to other students. A large proportion said this class was harder and had more homework than a non-satellite course (see **Figure 14**). A high proportion thought this course was harder and required more homework than a non-satellite course, as shown by **Figure 14**. Students perceived this course was valuable as staff development for their teachers, as indicated by **Figure 16**. This course was particularly valued as a preview of college work, as shown by **Figure 17**. A high proportion of students in this course said they would unreservedly recommend this course to other students, and an even higher proportion said they were fortunate to have an opportunity to take this course. Not as many students planned further study of the subject as Course 6, but the total was well above the average for all courses, as indicated by **Figure 18**. This course had the second highest percentage of students who said they interacted by phone at least once a month, as shown by **Figure 20**. The perception one gains from working with the data on this course is that students who were motivated by an interest in the subject were especially well-satisfied with this course.

Course 8

Fifty-two percent of the students in this course were female. This course attracted an 88% minority enrollment, while 12% of the students were white. Forty-two percent of the mothers had not finished high school, while 17% were college graduates; 46% of the fathers did not finish high school, about 13% were college graduates. English was the only language spoken in 96% of the homes. The two primary reasons for enrolling were to prepare for college (33%), and interest (21%). The persons most responsible for their taking the course were an administrator or counselor (63%) and themselves (29%). Seventy-one percent said they were among the best in their graduating class, while another 17% were above average and 12% average.

When they do well in a course, two-thirds said it was because they worked hard, while 17% said it was because they were good in that subject, 12% because they were lucky. Two-thirds said that when they do poorly in a class, it was because they did not work hard enough, 8% because they were not good in that subject, and 25% because it was a difficult course. Eight percent agreed that luck is more important than work. Only 4% needed this particular course for college, but 92% planned to attend college.

Just over half agreed that there was too much material and it was too easy to fall behind, but a smaller proportion (42%) agreed that their whole class had trouble keeping up. On the items concerning testing practices, 38% said there was adequate guidance to help them prepare for tests, 29% agreed they were able to learn from their mistakes on tests, 42% agreed that the grading system was fair. Since this was an advanced placement course, students' confidence about taking this course in college is of particular interest: 29% would be confident about taking the same course in college; 21% would be confident about taking the next level course in college; 42% were considering further study of this subject.

Only 17% said they learned from the computer drills, and 65% said they had expected more computer use. One-third of the students said they used the software once a week, 13% said two or three times a month, 21% once a month and 29% never. Compared to the same course, taught by a conventional teacher without satellite, 54% thought the satellite course was harder, 71% thought it had more homework. One quarter said they had learned a great deal or as much as they expected.

Half had never called in a question during a broadcast, while another third said they called in once a month. A larger percentage had never called in at other times during the school day (58%), while 21% called in once a month and 13% called in once a week. Some discomfort about calling was expressed by 43%, and 54% said they had had trouble getting questions answered.

An equal number of students reported they studied less than two hours and from two to three hours per week for this course (38%), while 24% studied more than four hours. Most students expected a lower grade in this course than they typically get. Half said this course expected too much study skill, 37% said it expected too much self motivation, and 42% too much memorization.

Compared to students in the other courses, these students were statistically more likely to agree that this course attempted to cover too much material ($p < .01$). Students in this course were less likely to agree that they were given adequate guidance in preparing for tests ($p < .01$), or that they were able to learn from their mistakes on tests ($p < .01$). Students in this course were statistically different from students in the other courses in agreeing that their whole class was having trouble keeping up with the TV instructor (p <

.05). Students in this class indicated feeling less support in their learning ($p < .05$), by agreeing with the statement, "There is no one to help you."

Figures 1 and 2 show that a smaller proportion of students in this course had parents who were college graduates than Courses 5-7. **Figure 7** indicates that a relatively low proportion of students in this course were confident about taking the same course again in college. **Figure 8** shows what proportion expected to get an A. **Figure 11** shows that a above-average proportion of students in Course 8 said they had trouble getting answers to their questions and expected more communication with the instructor. This course had the third highest percentage of students who said they interacted by phone at least once a month, as shown by **Figure 20**. A majority of students in this course indicated some disappointment with their learning, as shown on **Figure 13** as well as **Figure 7**, which suggested they were not very confident about taking the same course in college, much less going on to the next level course. Although this was a very able group of students as indicated by class rank, **Figure 15** shows that nearly half said this course expected too much study skill and over 40% said it required too much memorization. Nevertheless, **Figure 18** shows that over 60% said they would definitely recommend the course to other students.

Course 9

The student population in this course was 46% male, 54% female. Fifty-six percent of these students were white, 44% minority. Nearly a quarter of these students' mothers had not finished high school (23%), while 27% finished high school and 38% finished college; 21% of the fathers did not finish high school, 31% were high school graduates, and 31% graduated from college. English was the only language in 85% of the homes.

Students' primary motivation for enrolling was to prepare for college (36%), while "someone persuaded me to take it" accounted for 21%, and various other reasons for 35%. The percentage of students who enrolled out of interest was unusually low, and the percentage who were encouraged to take the course by an administrator or guidance counselor was unusually high. Another 27% said that taking it was their own decision. Half the students said they were among the best in their graduating class, 23% above average and 25% average.

When these students do well in a course, 48% said it was because they worked hard, 25% because they were good in that subject. The percentage who attribute success to external causes was unusually high: 15% because of an easy course and 12% to luck. When they do poorly in a course, 60% say it was because they worked hard, 10% because they are not good in that subject, 21% because it was a difficult course, and 6% to bad luck. A related question asked students if luck is more important than work. Almost 13% agreed that luck is more important than work while 77% disagreed.

Ninety-two percent planned to attend college, and 69% said they needed this particular course for college. The number who agreed the course tried to cover too much material was equal to the number who disagreed. But 83% thought this course had been more difficult than the same course taught entirely by a conventional teacher, and 30% said there was more homework than a conventional course. A total of 53% said they learned as much as they expected or a great deal. On the items dealing with testing practices, 38% believed they had been given enough guidance to prepare for tests, while 35% disagreed; 46% agreed they had been able to learn from their mistakes on tests, 29% disagreed. The grading system was considered fair by 58%.

Since this was another of the advanced placement courses, the items about college study were instructive. Nearly half agreed they would be confident about taking the same course in college, compared to 34% who disagreed; 36% agreed they would be confident about taking the next level course in college, while almost half disagreed. Thirty percent would consider further study of the subject.

Decisions about how much material to attempt to cover are never easy. Thirty-six percent agreed this course tried to cover too much material, while 55% agreed it was too easy to fall behind individually, 47% said their whole class could not keep up with the TV instructor, and 56% agreed with the statement, "I thought we would go slower and learn more."

A total of 38% said they learned a lot from the computer work. While 31% said they had never used the software, 10% used it once a month, 17% two or three times a month, 33% at least once a week or oftener. One-third had never called in a question during a broadcast, 19% once a month, 12% two or three times a month, and a total of 36% at least once a week or oftener. A slightly higher percentage had never called in a question during the off-air periods, and an equal percentage (38%) called in at least once a week.

The number of hours per week students reported studying for this course ranged from less than two hours (35%), two to three hours (40%), and more than four hours (25%). Almost 40% said the course expected too much self-motivation, compared to 46% who said it was about right; 27% said it expected too much study skill, compared to 54% who said it was about right; only 19% said it expected too much memorization, compared to 48% who said it was about right.

Figure 6 indicates that an unusually large proportion of students in Course 9 needed this particular course for college. **Figure 11** shows a rather high proportion of students in Course 9 expected more communication with the instructor. Compared to other courses shown on **Figure 14**, a very large proportion of students in Course 9 said this class was harder than a non-satellite class would have been. **Figure 15** suggests that an above average proportion said this course required too much self motivation. Over half of the students said they would definitely recommend this course. **Figure 18** shows how many students would definitely recommend this course, and how many agreed they were fortunate to get to take this course at all. As indicated earlier, courses 9 and 10 were at a disadvantage on that item because some schools subscribed to those courses to fulfill their contractual obligations, not because there was no other way they could teach those subjects. **Figure 17** shows Course 9 was close to the average in the degree to which students perceived this course to be an opportunity to take a challenging course, learn technology and preview college work. **Figure 20** shows that this course was relatively high in the proportion of students who interacted by phone when the program was not on the air.

Course 10

In this class, 33% of the the students were male; 29% African American and 71% white. While 29% of these students' mothers did not finish high school, 33% graduated from high school and 29% graduated from college. Only 9% of the fathers did not finish high school, 52% were high school graduates, and 19% were college graduates. English was the only language in 95% of the homes. Four percent said they were below average students, 19% said they were average, 19% above average, and 58% among the best in their graduating class.

Nineteen percent reported taking this class out of interest, 10% said they took it to prepare for college, 14% because there was no other course they wanted to take, and 57% because someone persuaded them to take it. Nine percent said a teacher had encouraged them to take it, 76% said an administrator or counselor had encouraged them to take it, and 14% said it was their own decision. Two-thirds said they would have taken the course if had not been by satellite, 24% said they would not have taken it and nine per cent did not know.

When these students do well in a course, 52% said it was because they worked hard, 29% because they are good in that subject, and a total of 19% attributed that result to external causes: half because it was an easy course, half because they were lucky. When they do poorly in a course, 68% said it was because they did not work hard enough, 14% because they are not good in that subject and 19% because of external causes--divided equally between course difficulty and bad luck. Only 14% agreed that luck was more important than work, while 81% disagreed.

Only 5% were not planning to go to college while 95% were. Over half said they needed this course for college, while 29% did not. These students were not as academically self-confident as those in some of the other courses: 38% said they were among the best in having the ability to complete college, 71% above average, 24% average, and 5% below average. In evaluating the quality of their own work, 19% said it was excellent, 62% said it was good, and 19% said it was average. It was unusual for students in any satellite class to say they were uncertain about their ability, but in this course, 5% said they were very uncertain, 10% somewhat uncertain, 25% certain and 60% very certain. A total of 47% agreed they would feel confident about taking the same course in college, while 38% disagreed. Twenty-nine percent agreed they would feel confident about taking the next level course in college, while 62% disagreed.

On the items assessing the amount of material being covered and the pacing of instruction: 48% agreed this course attempts to cover too much material, 71% said it was too easy to fall behind individually, while two-thirds said their whole class had trouble keeping up, and agreed with the statement: "I thought we would go slower and learn more."

One-third of the students agreed that they were given enough guidance to help them prepare for tests; 48% said they were able to learn from their mistakes on tests; and 52% agreed the grading system was fair, compared to 19% who disagreed.

The importance of computer-assisted instruction varied by course, so the items related to computer-assisted instruction should be interpreted accordingly. While 24% agreed that they had learned a lot from the computer work, two-thirds disagreed. Two-thirds had expected more computer work in the course. Five percent reported using the software once a week, 48% had never used it, and 24% said they used it two or three times a week.

On the items assessing interactions by phone, 52% said they had never called in a question during the broadcasts, 24% once a month, and a total of 19% two to three times a month or oftener. A total of 52% agreed they had trouble getting questions answered.

One-third of the students reported spending less than two hours per week studying, while 28% said two to three hours and 19% more than three hours. Most expected to get a lower grade in this satellite course than they usually got. Forty percent said this course required too much self-motivation while an equal number said it was about right. Only 20% said it expected too much study skill while 60% said it was about right: only 15% said it expected too much memorization while 40% said the expectations were about right.

Students in this course were statistically more likely to say they had trouble paying attention to the broadcasts ($p < .001$), that their whole class had trouble keeping up ($p < .01$), and to agree that "There is no one to help you" ($p < .01$). On the other hand, there was no significant difference between students in this course and all other students in the ease of falling behind individually. There was no significant difference in agreement with the statement "I thought we would go slower and learn more." Students in this course were statistically less likely to say they were given adequate guidance in preparing for tests ($p < .001$), and that they were fortunate to get to take this course at all ($p < .001$).

Figure 3 indicates that an unusually large proportion (70%) of these students had some extrinsic motivation for taking the course, which suggests they might be more difficult to teach and that the group average for the course evaluation items might be lower, for reasons which are internal to the students rather than because the quality of instruction is substantially different. **Figure 6** suggests that a high proportion of students planned to attend college, and an above-average proportion said they needed this particular course for college. **Figure 7** indicates that an above-average proportion felt well enough prepared to take the next level course in college--which is a particular success since college preparation was not a major emphasis of this course. **Figure 8** suggests that many students who typically get A's were not expecting an A in this course. **Figure 9** shows a relatively high proportion saying it was too easy to fall behind. **Figure 14** shows that a relatively high proportion thought this course was harder and required more homework than a non-satellite class would have been. A rather high proportion said this course expected too much self-motivation (as shown by **Figure 15**), but this group of students came to the course with far less self-motivation.

Part II: Teaching Partners

Eighty percent of the teaching partners who responded to this survey had attended the Distance Learning Conference in Jackson, Mississippi, in November 1989. **Table 11** shows the results of the teaching partner evaluation. These 55 teaching partners represented the following courses by satellite: 11 Basic English and Reading, 9 German I, 1 German II, 17 Spanish, 2 Russian, 3 Applied Economics, 4 AP American Government, 4 AP Chemistry, 2 AP Calculus, 3 Trigonometry/Analytic Geometry (one worked with two different courses). They reported that their primary teaching responsibilities were: 9.1% in Mathematics, 3.6% Vocational/Business Education, 7.3% Social Science, 1.8% Special Education, 3.6% Physical Education, Music or Art, 7.3% Foreign Language, 20% English, 16.4% Science, 18.2% Guidance/Librarian, 12.7% Other. A total of 3.6% of these teaching partners worked in grades K-8, while 10.9% worked at a middle school, 9.1% at a junior high school, 18.2% at a three-year high school (grades 10-12), 52.7% at a four-year high school (grades 9-12) and 5.5% at a school including all secondary grades. Two of these teaching partners had taught for three years or less, six had taught for four to six years, five had taught for seven to nine years, 10 had taught for 10-12 years, and another 29 had taught 12 years or more. The satellite class was part of the regular teaching load for 87% of the respondents, while it was not part of the regular teaching load for 13% of these teaching partners.

When asked, "Overall, how good of an experience was your year/semester as a teaching partner?" 47% said it had been a very good experience, 34% said it had been a good experience. Only 5.5% said it had been a bad experience while 13% were undecided. While 25% viewed the programs in their own classroom, 45% viewed them in another classroom, 20% in the library/media center and 9% viewed them somewhere else. Those who viewed the programs in their own classroom more often said it was a good experience than those who viewed the programs in the media center or another classroom.

As **Table 11** indicates, enrollments in satellite classes in Mississippi ranged from 1-41, with 13% of the teaching partners reporting 1-5 students, 51% saying they had 6-10 students, 27% saying they had 11-15 students, and the remaining 9% having more than 16 students. Teaching partners were asked to estimate the number of students in their classes who receive Chapter 1 services. Over three-fourths said less than 9% receive such services. One-third of these teaching partners said less than 9% of the students in their class were racial/ethnic minority. Twenty-four percent of the teaching partners said that 90-100% of their students were racial/ethnic minority. Two-thirds of the teaching partners said that less than 9% of their students were a grade or more behind in reading, while 72% said that less than 9% were a grade or more behind in mathematics.

Several reasons why a school might offer a satellite course were listed so the teaching partners could choose one that applied at their school. The reason chosen most often was "to increase course offerings" at 56%, while 6% chose "no certified teacher," 11% chose "could not justify the cost of hiring a teacher," 2% chose state requirements as the reason for initiating satellite instruction, and 17% chose the "other" category.

Most of the Mississippi schools were using satellite instruction for the first time, so perhaps it is not surprising that only 40% volunteered to be teaching partners compared to 60% who did not volunteer. Only one of the volunteers saw being a teaching partner as a bad experience, while two of those who did not volunteer saw it that way.

Ninety-three percent of these teaching partners said they would recommend courses by satellite. Several questions asked how satisfied the teaching partners were with various aspects of the course with which they had worked: 46% were very satisfied with the overall quality of the satellite course, 42% were satisfied, only 4% were dissatisfied. A total of 97% were satisfied with the technical or production quality of the satellite course. Only 5.5% were dissatisfied with the quality of the satellite course compared to their own teaching, while a total of 83% were satisfied or very dissatisfied. Almost 80% were satisfied with the level of difficulty of the satellite course, while 7% were dissatisfied.

A total of 91% said they were satisfied with the content of the satellite course. Three-fourths of the teaching partners were satisfied with the knowledge their students gained, while 15% were dissatisfied. Access to technical support was satisfactory to 91% of the teaching partners, and access to content support was satisfactory to 84%. Just over two-thirds were satisfied with the computer-assisted learning part of the course they worked with, while 9% were dissatisfied and 15% neutral. Two percent indicated they were dissatisfied with the training they received, while 71% were satisfied.

Teaching partners were asked how frequently their students asked a question when the program was on the air. Almost 42% said "about once a month," 29% said "never," and 18% said "two or three times per month." It should be remembered that students might have called for other reasons, for example to participate in class discussion or recitation. Where students viewed the programs did not make as much difference as one might think in the frequency of interaction. The most common combination was 11 teaching partners who viewed the programs in another classroom who said their students asked a question on the air once a month. Only three said their students asked a question on the air more than two or three times per month. The three teaching partners who considered the question inappropriate viewed the programs on tape.

Besides asking questions when the programs were on the air, students can call in at other times during the day, but 35% of the teaching partners said their students never called in a question when the program was not on the air. Another 32% called in about once a month, 26% called in two or three times a month, 8% at least once a week.

Teaching partners were asked if there was a phone available for students to use during the broadcasts, and 75% said "yes," while 11% said "no" and 11% said "sometimes." Four with no phone available never called in during the broadcasts, one of those managed to call in once a month.

Five of those teaching partners who were very satisfied with the computer-assisted aspect of the course used the software only once a month, while three used it two or three times a month, three once a week and nine used it three times a week. It should be remembered that some of this frequency data reflect course differences, for example, the computer-assisted component is emphasized far more in some courses than others. Those who were dissatisfied with the computer-assisted aspect of the course used the software very infrequently. (Unfortunately, this item did not tell us whether they used it infrequently because they were dissatisfied or if there was some other sequence of causes and effects.)

The ratio of students per computer ranged from one to five. Fourteen percent reported one student per computer, 33% two students per computer, 15% three, 7% four and 22% five students per computer.

The Office of Distance Learning at the University of Mississippi had provided all the computers for 22% of the teaching partners' classes, some of the computers for 26% of the classes, and none of the computers for 53% of the classes. The classes were functioning with different combinations of computers: 60% all Apple II, 15% all IBM compatible, or 11% some of each, 2% Macintosh and Apple, and 13% not applicable. Some course software was written for IBM and adapted for Apple, some vice-versa. Each type of computer has its own strengths and weaknesses (and people have strong personal preferences). So a natural question to ask was whether there was an association between type of computer(s) being used in a class and teaching partners' satisfaction with the software. The most common combination of answers was 12 teaching partners with all Apple II computers who were very satisfied, while 11 were satisfied. Of those with all Apple II computers, four indicated some degree of dissatisfaction, while five could not decide if they were satisfied or not. Eight schools had IBM compatibles only, seven were satisfied or very satisfied, one undecided. Five of the six schools with a combination of Apple II and IBM- compatible were satisfied, one undecided. The configuration of equipment did not appear to be an influential factor in determining teaching partners' satisfaction with the software.

Thirty teaching partners (54.5%) reported that their classes usually viewed the programs live, while 17 (31%) said their students usually viewed the programs on tape, and 8 (14.5%) some combination of live and taped viewing. Of the 30 who usually saw the programs live, 21 were very satisfied or satisfied with the interactive aspect of the course. Fifteen of those 30 said their students called in once a month, eight called in two or three times a month, one once a week and six never. Of the 17 teaching partners whose classes usually viewed the programs on tape, ten said their students had never called in a question on the air, three said once a month, and one said his or her students had called in two or three times a month. Of the 17 teaching partners whose classes viewed the programs on tape, five were very satisfied about the interactive portion of the course, se' en said they were satisfied and three could not decide. Eight said they used both live and taped programs and five were satisfied.

One set of questions listed potential problems with satellite courses and asked the teaching partners how serious each problem had been for them. Twenty-two percent said that the motivation required was a serious problem (which seems to be in conflict with results for another item on motivation). Another 46% said motivation was a problem but not a serious problem. The only other problem considered serious by more than 10% of the teaching partners was instructor response speed, which 18% said was serious and 47% said was a problem but not serious. While 38% of the teaching partners said lack of interaction with the TV instructor was a problem but not serious, 56% said it was not a problem. While 46% said lack of feedback was a problem but not serious, 47% said it was not a problem. Scheduling was called a problem but not serious by 44% of the teaching partners.

Those charged with the responsibility of training the teaching partners should take comfort in the fact that 69% said inadequate technical training was not a problem. Another 64% said inadequate content training was not a problem; 62% said equipment malfunctions were not a problem; 67% said inflexibility of courses was not a problem; and 82% said disappointment with course quality was not a problem. Almost three-fourths of the teaching partners indicated that discomfort with the role of teaching partner was not a problem, while 18% indicated it was a problem but not serious.

One problem statement read, "Interaction between TV instructor and students was lacking or trivial." Not one of the teaching partners from the 17 classes that watched the programs on tape said that (interaction being trivial or lacking) was a serious problem, while only four of the 30 teaching partners whose classes viewed the programs live said that was a serious problem. Nine tape and eleven live classes said it was a problem but not a serious problem, while fifteen live and eight tape classes said it was not a problem.

Only 16% of the teaching partners said that the satellite courses expected too much of students in terms of self-motivation, while 76% said amount of self-motivation expected was about right. Only 15% of the teaching partners said too much study skill was expected, while 75% said the expectations were about right. Fifteen percent said too much memorization was expected while 78% said the expectations were about right.

Students, teaching partners and superintendents were asked how much they agreed or disagreed with several statements about the degree to which satellite courses provide students with special opportunities. **Table 14** pulls together data from the four audiences surveyed. In some respects, teaching partners were more aware of the opportunities than either students or superintendents. Eighty percent of the teaching partners agreed that students were fortunate to have such fine instructors (compared to 44% of the students and 76% of the superintendents); 76% said they as teachers got new ideas that they could use in their other classes (while only 55% of the students perceived that aspect). Eighty percent of the teaching partners said the satellite courses gave students a realistic preview of college work (compared to only 59% of the students and 64% of the superintendents). Ninety-six percent of the teaching partners agreed that satellite courses gave students an opportunity to take more challenging courses and learn the latest technology.

This evaluation indicated that very few teaching partners see serious problems with courses by satellite. While teaching partners showed an awareness of some problems inherent to technology-based distance education, such as scheduling, equipment malfunctions, instructor response speed, lack of interaction with the instructor and technical training, two-thirds to three-fourths of them felt they were taking the problems in stride. This evaluation revealed most teaching partners were extremely well-satisfied with the quality and level of opportunity which the satellite courses were offering their students.

Part III: Principals

Building principals at schools taking Midlands Consortium courses by satellite were also surveyed. Altogether, 49 agreed to participate, and the results are summarized on **Table 12**. For those responding, about half attended the Distance Learning Conference in Jackson in November 1989. Ten percent said their schools were capable of receiving Ku-Band, 12% C-Band, and 48% both. Three principals (6%) were at middle schools or junior highs, 16% at schools for grades 10-12, 49% at schools with grades 9-12, 12% at schools with all secondary grades, 16% at districts so small that grades K-12 were under one principal.

Nearly one quarter said they had been principals at their schools for four to six years, almost as many two to three years, and 20% for 15 years or more. Almost 30% had an enrollment of 300-399 students in their respective buildings, 38% had an enrollment of 700-799, and 12% had over 900. A total of 33% had 40 students per grade or less, 22% had 41-60 per grade, 45% had more than 60 per grade. The most common categories of staff size were 21-40 teachers and support personnel (55%) and 41-80 teachers and support personnel (31%).

Principals reported placing some restrictions on enrollment in satellite courses, whether according to grade level (65%), prior achievement (71%), or in order to limit class size (65%). Only 15% said they had to modify their school calendar to accommodate courses by satellite but 26% said they had modified the times when classes begin and end. The control over enrollment is noteworthy, as is the natural fit of classes to the existing school calendar.

The principals were asked why satellite instruction had been initiated in their school, and their answers differed somewhat from those of the teaching partners. The reason "to increase course offerings" was chosen by 16% of the principals, while 57% chose "to satisfy student or parent requests" for the course, 16% chose the cost of hiring another teacher, and 4% chose lack of an available certified teacher as the reason. Over half (55%) of these principals said they had learned about satellite courses from the Office of Distance Learning at the University of Mississippi, while 20% heard about them from their superintendents, and 10% heard about them from the producers of the courses. Ninety-eight percent of the principals said they would recommend courses by satellite.

The proportion of students in special categories gradually increases as we move from class, to building and on to district level. Forty-one percent of the principals said less than 9% of students in their buildings receive Chapter 1 services, while another 28% said that 10-29% of their students receive Chapter 1 services. Twenty-one percent of the principals said that 90-100% of the students in their building were minority. Fifty-six percent had less than half minority students.

Several problems that schools might have with satellite instruction were listed and principals were asked how serious each had been at their schools. Some researchers have suggested that students with a history of low motivation and/or low achievement need more one-on-one interaction with their teachers in order to learn, therefore mediated instruction is not likely to succeed with such students. Some school administrators in other states who were considering courses by satellite have relayed a concern to distance educators that, while highly motivated students with good study skills can readily succeed in satellite courses, average or below average students are even less likely to do well than they are in conventional classes (Lawry, personal communication, February 10, 1989). Keeping in mind that principals do impose some restrictions on which individual students can take satellite courses, we found no evidence that satellite instruction is inappropriate for schools with a high proportion of students who receive Chapter 1 services, or who are a year or more behind in reading or math.

Only four out of 49 principals said that the amount of student motivation required was a serious problem. Those four were at schools with 60-100% minority student populations. However 20 principals or 42% said the amount of motivation required by satellite courses was a problem but not serious, and 50% said it was not a problem at all. That 50% included 10 principals at schools with 60-100% minority populations. Some of those same school districts have high proportions of students who are eligible for free or subsidized lunches--which is one indication of low socioeconomic level.

A similar pattern of responses occurred for the statement, "The TV instructor cannot respond to students' reactions, speed up or slow down." Only two of 49 principals (4%) saw that as a serious problem, 28 (58%) as a problem but not serious, and 17 (35%) as not a problem. The lack of immediate feedback for students was seen as a serious problem by three principals, while 26 saw it as a problem but not serious, and 19 as no problem at all. Principals at schools where larger percentages of students are a year or more behind in reading were no more likely to see speed of presentation or lack of immediate feedback as a problem. While 43% of the principals read the statement "interaction between TV instructor and students is lacking or trivial" and said that posed some problem, another 51% said that was not a problem at all. Unforeseen costs, equipment malfunctions, scheduling, and inflexibility were not seen as serious problems, and none of the principals were disappointed with the quality of the courses. Once again, principals were aware of the kinds of problems that can occur in technology-based distance education, but they had been able to take those problems in stride.

Forty-eight of the 49 principals (98%) said they would recommend satellite instruction to other districts. The most popular reason (57%) for taking a course by satellite was to increase course offerings. Two principals (4%) said they subscribed to a course by satellite because they could not find a certified teacher in that subject. Eight principals or 16% said they could not justify the cost of hiring another certified teacher. One principal said their school subscribed to a satellite course to meet state requirements, one to satisfy student or parent requests. Eight principals (17%) indicated that other reasons had prompted their school's involvement with the satellite course.

Principals were overwhelmingly satisfied with the satellite courses on every dimension except cost, where five principals (10%) expressed some dissatisfaction, and eight (16%) were ambivalent. Still three-fourths of the principals were satisfied with the cost of satellite compared to non-satellite courses. Ninety-eight percent of the principals were satisfied with the quality of instruction by satellite, 100% with their technical or production quality, 84% with the level of difficulty (with only 2% expressing dissatisfaction), 100% with course content, 98% with their curricular fit, 90% with the amount of knowledge their students gained, 92% with the access to technical support and 96% with the access to content support.

Part IV: Superintendents

Superintendents at districts taking Midlands Consortium courses by satellite were surveyed and 45 responded. The results are summarized on **Table 13**. Eighteen superintendents (40%) said they had attended the Distance Learning Conference in Jackson in November 1989. Only two of the superintendents said their schools were not rural. Almost 30% said their districts had enrollments of 10,000 or more, while over 50% said their districts were larger than that. One-third said they had been superintendents for two to three years; 18% had served for seven to nine years, another 18% for 10-12 years; and 13% for more than 15 years. Seventy-one percent said the number of teachers or support staff for their district was over 100. Forty percent said the average number of students per grade in their district was 101-200, while 18% had more than that and 42% had less.

Almost 70% of the superintendents had first learned of satellite instruction from the Office of Distance Learning at the University of Mississippi. Forty-two superintendents (93%) said they would recommend courses by satellite to other districts, while three (7%) were uncertain. School board members' attitudes toward satellite courses were reported to be very favorable by 49% of the superintendents, favorable by 47%, and very unfavorable by 4%. Teachers' attitudes toward satellite courses were reported to be very favorable by 38%, favorable by 53%, and very unfavorable by 9% of the superintendents.

Approximately three-fourths of the superintendents said their districts were at (36%) or slightly below (40%) the national average. Four percent said the average level of achievement of students in their districts was much above the national average, 7% slightly above, 36% right at the national average, 40% slightly below, and 13% much below. Cross-tabulations of item pairs gave no indication that superintendents in districts with lower achievement or lower socioeconomic status were any less satisfied or less likely to recommend satellite instruction.

Superintendents were asked to estimate the proportion of students in their district who receive Chapter 1 instructional services, free or reduced price lunches. One quarter of the superintendents said that 20-29% of their students receive Chapter 1 instructional services, a total of 19% said less than 20%, a total of 31% said 30-49%, and 22% said that over half their students receive such services. They were also asked what proportion were racial or ethnic minority, are a grade or more behind in reading or math and are likely to finish high school. A total of 49% of the superintendents said less than 50% of their students were racial/ethnic minority. Almost 16% had minority enrollments of over 90%. Superintendents indicated that the proportion of students who were a year or more behind in mathematics was higher than the proportion who were a year or more behind in reading.

The superintendents were given a list of potential problems with satellite instruction and asked whether each would be likely to limit the use of satellite instruction. Almost 36% of all superintendents said that the cost of satellite courses would be a serious problem limiting their use, while almost 38% said that was a problem but not serious, and 22% saw that as no problem. That was the only problem considered serious by a substantial number of superintendents. Fourteen percent said the amount of self-motivation expected of students was very likely to limit use of satellite instruction, while 72% said it was somewhat likely to limit use. Only 5% said that course difficulty was very likely to limit use, while 39% said it was somewhat likely to limit use, and 52% said it was not likely to limit use. A total of 44% thought state education department policies and regulations were likely to limit use of satellite instruction, while 49% thought that was not likely.

Superintendents expressed very little dissatisfaction with courses by satellite; neither degree of underachievement in their districts, extent of economic disadvantage, nor size of district in terms of enrollment made any discernable difference in their perceptions. A total of 93% were satisfied with the quality of instruction and none said they were dissatisfied. All 45 said they were satisfied with the technical or production quality. Almost 73% were satisfied with the cost of satellite courses compared to other alternatives. Eighty-two percent were satisfied with the level of difficulty, 93% with the content, 98% with how the satellite courses fit into their curricula, 85% with the amount of knowledge their students were gaining (only one person was dissatisfied), 85% with the level of technical support they received, 76% with the level of content support.

Summary of Mississippi Evaluation Results

Tables 14 was constructed to facilitate comparisons among the three adult audiences on certain items. **Table 15** shows some of the differences between the perceptions of students and those of teaching partners.

One way of evaluating an educational innovation is identify the worst things people have said about it, and then find out if those views are widespread or limited to a tiny minority. If the ugly rumors are true, producers and consumers ought to know, so steps can be taken to solve the problems were only appropriate for the "best" students; were watered-down college courses which are far too difficult, competitive and discouraging for average high school students; if equipment problems continually got in the way of student learning; if satellite courses made local teachers feel threatened or unnecessary; or if students felt cheated by not having a "real" teacher on-site--the citizens of Mississippi or any other state ought to know those things.

This evaluation inquired into all those ugly rumors, and found no evidence to support any of them. Indeed, it is difficult to imagine an educational innovation being more favorably received or appreciated by superintendents, principals, teaching partners, and even by students--the toughest customers of all. While it might be said that the most disgruntled students had transferred out of the satellite courses by the time the evaluations were administered, students in general are less likely to be enthused about educational processes of any kind in the late spring than at any time of the school year. Still, the great majority of students indicated considerable satisfaction with the satellite courses, how much they had learned, and how much help they had received. There were very few complaints about the courses being too difficult or demanding. While the distance between them and their instructors was occasionally frustrating, there were few indications that they felt cheated by not having an on-site teacher fully qualified to teach the class. A majority of students indicated they believed the class had been a positive opportunity, not a better-than-nothing substitute.

Besides the extremely favorable responses to satellite instruction by all four audiences surveyed, another conclusion which might be drawn relates to the great variability among individual satellite courses offered by only two different producers within the larger organizational structure provided by Midlands Consortium. While it is difficult to argue with the conclusion that satellite instruction can be effective and has been effective for students in Mississippi, it may not be safe to conclude that all satellite instruction will necessarily be effective. The wide differences among courses suggest that the instructional message is more important than the instructional medium.

Table 1
Characteristics of Students Being Served and Use of Downlinks by Oklahoma Schools Which Received Downlink Grants in 1989

District	Staff	Students	Estimated Percent of Students Who Are: Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	Use of Downlink
Apache	46	181	29	53	40	German I
Ardmore City	68	894	63	36	35	German I
Bell Elementary		139	25		93	Basic English and Reading
Cashion	36	126	7	7	0	Russian, Basic English and Reading
Chickasha	97	959	41	30	19	German I, Applied Economics, AP Am. Government
Comanche		302	11			German I, AP Chemistry
Covington-Douglas	29	285	14	29	3	Non-course programs for students
Deer Creek-Lamont	35	201	10	25	0	Basic English and Reading
Dewar	26	44	32	48	26	Trigonometry/Analytic Geometry
Elgin	24	220	13	33	19	Basic English and Reading
Erick	14	75	11	40	10	Spanish I
Fairfax		401	43	52	42	German I
Felt	13	79	8	38	6	Discovery, Learning Channel
Hilldale	66	697	7	16	17	Report not received
Hobart	40	423	11	49	33	Basic English and Reading
Inola	101	621	3	18	1	Basic English and Reading
Jenks	125	2026	4	7	6	Russian, AP Calculus
Jones	70	535	20	32	2	Russian, Basic English and Reading
Lawton	2218	17699	9	39	38	Report not received
Liberty (Mounds)	61	172	17	38	27	German I
Lone Wolf		105		33		German I, II
Miami	272	2340	24	42	36	Report not received
Minco	45	250	5	19	1	German I, NASA programs
OK City,Douglass		910			68	AP Calculus
OKCity,StarSpencer		776			83	AP Chemistry,Trigonometry/Analytic Geometry

Table 1
Characteristics of Students Being Served and Use of Downlinks in Oklahoma Schools Which Received Downlink Grants in Summer 1989

			Estimated Percent of Students Who Are:			
	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	
Pond Creek-Hunter	27	90	15	20	0	German I
Soper		91	9	57	27	German I
Sulphur	33	370	12	32	2	AP Physics
Varnum	32	31	15	50	20	German I
Verden	44	276	7	30	12	German I
Wagoner	77	562	12	42	42	German I, Russian
Waukomis		153	7	36	3	German I, AP Physics
Wellston	60	625	7	33	7	German I, Basic English and Reading
Wilson	45	170	25	45	31	German I, Trigonometry/Analytic Geometry
Wright	68	156	15	60	39	German I
Totals	3772	32984				
Means	111	970	16%	32%	23%	

Table 2
Total Number of Oklahoma School Staff and Students Potentially Impacted By Midlands Consortium Grants Made During the First Year, Showing Estimated Total Number of Chapter 1, Minority and Disadvantaged Per District

			Estimated Number of Students Who Are:		
District	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority
Apache	46	181	52.49	95.93	72.4
Ardmore City	68	894	563.22	321.84	312.9
Bell Elementary		139	34.75		129.27
Cashion	36	126	8.82	8.82	0
Chickasha	97	959	393.19	287.7	182.21
Comanche		302	33.22		
Covington-Douglas	29	285	39.9	82.65	8.55
Deer Creek-Lamont	35	201	20.1	50.25	0
Dewar	26	44	14.08	21.12	11.44
Elgin	24	220	28.6	72.6	41.8
Erick	14	75	8.25	30	7.5
Fairfax		401	172.43	208.52	168.42
Felt	13	79	6.32	30.02	4.74
Hilldale	66	697	48.79	111.52	118.49
Hobart	40	423	46.53	207.27	71.91
Inola	101	621	18.63	111.78	6.21
Jenks	125	2026	81.04	141.82	121.56
Jones	70	535	107	171.2	10.7
Lawton	2218	17699	1592.91	6902.61	6725.62
Liberty (Mounds)	61	172	29.24	65.36	46.44
Lone Wolf		105		34.65	
Miami	272	2340	561.6	982.8	842.4
Minco	45	250	12.5	47.5	2.5
OK City,Douglass		910			618.8
OKCity,StarSpencer		776			644.08
Pond Creek-Hunter	27	90	13.5	18	0
Soper		91	8.19	51.87	24.57
Sulphur	33	370	44.4	118.4	7.4
Varnum	32	31	4.65	15.5	6.2
Verden	44	276	19.32	82.8	33.12
Wagoner	77	562	67.44	236.04	236.04
Waukomis		153	10.71	55.08	4.59
Wellston	60	625	43.75	206.25	43.75
Wilson	45	170	42.5	76.5	52.7
Wright	68	156	23.4	93.6	60.84
Totals	3772	32984	4151.47	10940	10617.2

Table 3
Characteristics of Students Being Served and Use of Downlinks By Mississippi Schools Which Received Downlink Grants in 1989

			Estimated Percent of Students Who Are:			
District	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	Use of Downlink
Aberdeen	150	2300	30	70	70	AP American Government
Anguilla	45	650	38.2	96.1	99.6	German I
Baldwyn	111	1067	21	60	40	Spanish I
Benton			23	79	67	
Calhoun	75	965	40	64	47	Spanish I
Carroll	15	180	40	93	92	
Carroll	90	1200	44	93	75	
Carthage	30		21	69	50	Spanish I
Claiborne County	271	2100	49	92	12	Spanish I, Trigonometry/Analytical Geometry
Clarksdale Municipal	275	4500	38	78	76	AP Calculus
Clay	62	625	20	93	90	
Cleveland		78	65	75	67	Spanish I
Coahoma	44		80	94	26	AP American Government, Applied Economics
Coffeeville		934	40	85	73	Spanish I
Corinth	211	1936	20	46	30	AP Calculus,
Durant	70	741	35	90	68	Trigonometry/Analytical Geometry
Forrest	45	770	7	50	25	AP American Government, Applied Economics
Franklin	182	1913	63.3	63	46	Spanish I
Gulfport	400	7000	30		31	Russian
Hancock County	150	2490	37	68	7	
Houston	125	2100	28	55	40	AP Chemistry, AP Am. Government, Applied Econ.
Humphrey County	154	2675	46	89	97	Basic English and Reading
Indianola	346	3400	38	85	12	
Kemper	270	1800	15	90	90	Spanish I
Lafayette	164	2070	14.5	50	38.5	German I, Basic English and Reading
Lee County	51	1487	12	56	37	

Table 3
Characteristics of Students Being Served and Use of Downlinks In Mississippi Schools Which Received Downlink Grants in Summer 1989

District	Staff	Students	Estimated Percent of Students Who Are: Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	Use of Downlink
Lee County	88	1037	10	40	30	
Lowndes	85	1400	17	48	41	
Lumberton	75	890	69	60	39	Spanish I
Marshall County	70	612	73	82	55	Spanish, AP Chemistry
Nettleton	90	1400	25	50	33	Spanish I
New Albany	198	2100	17	32	25	German I
North Panola	38	672	75	93	98	Spanish I
Okolona	110	1300	50	65	70	Spanish I
Oxford	225	2600		33	49	
Picayune School	480	3939	30	42	27	German I
Pillow Academy	62	634	0	0	3	AP Calculus, AP Chemistry
Pontotoc	204	1785	18	53	30	AP American Government
Quitman County	386	23833	35	92	12	Spanish I, AP American Government
Senatobia City	120	1300	38	38	40	AP Physics
Smith County			26	59	32	AP Calculus
South Pike (Magnolia)	266	2972	24	85	72	AP Chemistry
South Tippah	215	2692	17	57	26	
Sunflower	21	2662	36	90	95	
Tate	34	554	30	65	57	
Webster	53	2040	20	55	35	Spanish I
West Bolivar	198	1682	53	93	94	AP Physics
West Point	475	3609	24	72	65	Basic English and Reading
West Tallahatchie	110	1633	45	95	90	AP Physics
Western Line	275	2253	27	83	51	
Winona	80	1450	30	65	52	Spanish I, Basic English and Reading
Totals	7294	108230				
Means			33	67	52	

Table 4
Total Number of Mississippi School Staff and Students Potentially Impacted By Midlands Consortium Grants Made During the First Year, Showing Estimated Total Number of Chapter 1, Minority and Disadvantaged Per District

			Estimated Number of Students Who Are:		
District	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority
Aberdeen	150	2300	690	1610	1610
Anguilla	45	650	247	624	643.5
Baldwyn	111	1067	224.07	640.2	426.8
Calhoun	75	965	386	617.6	0
Carroll	15	180	72	167.4	165.6
Carroll	15	180	72	167.4	165.6
Claiborne County	271	2100	1029	1932	252
Clarksdale Municipal	275	4500	1710	3510	3420
Clay	62	625	125	581.25	562.5
Cleveland		78	50.7	58.5	52.26
Coffeeville		934	373.6	793.9	280.2
Corinth	211	1936	387.2	890.56	580.8
Durant	70	741	259.35	666.9	222.3
Forrest	45	770	53.9	385	192.5
Franklin County	182	1913	1205.19	1205.19	879.98
Gulfport	400	7000	2100		2170
Hancock County	150	2490	921.3	1693.2	174.3
Houston	125	2100	588	1155	567
Humphrey County	154	2675	1230.5	2380.75	2594.75
Indianola	346	3400	1292	2890	408
Kemper County	270	1800	270	1620	1620
Lafayette	164	2070	300.15	1035	796.95
Lee County	51	1487	178.44	832.72	550.19
Lee County	88	1037	103.7	414.8	311.1
Lowndes	85	1400	238	672	574
Lumberton	75	890	614.1	534	347.1
Marshall County	70	812	592.76	487.2	546
Nettleton	90	1400	350	700	462
New Albany	198	2100	357	672	525
North Panola	38	672	504	624.96	658.56
Okolona	110	1300	650	845	910
Oxford	225	2600		1690	1820
Picayune School	480	3939	1181.7	1654.38	1063.53
Pillow Academy	62	634	0	0	19.02
Pontotoc	204	1785	321.3	946.05	535.5

Table 4
Total Number of Mississippi School Staff and Students Impacted By Midlands Consortium Downlink Grants Made During the First Year, Showing Estimated Total Number of Chaper 1, Minority and Disadvantaged Per District

			Estimated Number of Students Who Are:		
District	**Staff**	**Students**	**Eligible for Chapter 1**	**Eligible for Lunch Subsidy**	**Minority**
Quitman County	386	23833	8341.55	21926.36	2859.96
Senatobia City	120	1300	494	494	520
South Pike (Magnolia	266	2972	713.28	2526.2	2139.84
South Tippah	215	2692	646.08	2288.2	1938.24
Sunflower		2662	958.32	2395.8	2528.9
Tate	34	554	166.2	360.1	315.78
Webster	53	2040	408	1122	714
West Boliver	198	1682	891.46	1564.26	1581.08
West Point	475	3609	866.16	2598.48	2345.85
West Tallahatchie	110	1633	734.85	1551.35	1469.7
Western Line	275	2253	608.31	1869.99	1149.03
Winona	80	1450	675.9	942.5	754
Totals	**7124**	**107210**	**34182.07**	**74336.2**	**44423.42**

Table 5
Characteristics of Students Being Served and Use of Downlinks by Kansas Schools Which Received Downlink Grants in 1989

			Estimated Percent of Students Who Are:			
District	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	Use of Downlink
Anthony-Harper	82	1098	5.5	38	4	
Axtell	15	90	10	24	1	Spanish I
Barnes-Hanover	49	401	10	34	0	Spanish I
Cedar Vale	20	204	17	45	5	Spanish I
Cheylin	28	219	2	23	0	Spanish I
Dexter	20	160	22	49	3	Spanish I
Dighton	39	401	7	15	2	
Easton	58	653	5	40	5	
Elkhart	56	585	17	16	14	Spanish I
Flinthills	30	234	20	12	3	
Fowler	21	143	5	38	0	Spanish I
Greeley	36	367	20	25	8	
Greensburg	38	418	0	30	17	Spanish I
Haviland	25	174	17	44	0	Spanish I
Jetmore	31	246	11	33	2	Spanish I
Jewell	23	205				Spanish I
Kincaid (Crest)	27	291	10	30	1	Spanish I
Lebo-Waverly	49	491	10	28	0	Spanish I
Lewis	22	184	1	1	1	Spanish I
Meade	41	420	6	26.4	2	
Midway-Denton	24	205	25	60	2	Spanish I
Mill Creek Valley (Wabaunsee HS	5[illegible]	563	22	29	2	Spanish I
Minneola	22	209	7	27	0	Spanish I
Ness City	42	347	8.65	13.5	1.73	
North Central	32	168	14.3	51.2	0	Spanish I

Table 5
Characteristics of Students Being Served and Use of Downlinks in Kansas Schools Which Received Downlink Grants in Summer 1989

			Estimated Percent of Students Who Are:			
	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority	
Onaga-Havensville-Wheaton	38	449	12	18	0	
Oswego	45	461	0.2	0.38	0	
Paradise (Natoma)	25	178	16	39	2	Spanish I
Pawnee Heights	20	160	25	12	1	Spanish I
Pike Valley	32	261	10	24	1	Spanish I
Plainville	50	502	10	30	1	
Quinter	36	345	15	20	5	
Riley	49	578	5.8	16	2.6	
St. Francis	40	419	10	35	1.7	
Smoky Hill	22	205	15	20	1	
Sylvan Grove	23	220	10	30		
Troy	36	393	5	17	1	
Udall	42	384	9.7	18.5	0.1	
Utica	15	87	11	11	0	Spanish I
Vermillion (Centralia)	47	302	6	4	1	Spanish I
Vermillion (Frankfort)	34	315	5	31	1	Spanish I
Victoria	35	397	7	25	1	Spanish I
WaKeeney		660	9	37	0	Spanish I
Wallace	32	298	6	33	2	
Washington	41	418	57	20	37	
Winchester	42	473	11	25	3	
Woodson (Yates Center)	52	601	12	35	1	
Totals	1636	16582				
Means	35	404.439	13	30	3.32	

Table 6
Total Number of Kansas School Staff and Students Potentially Impacted By Midlands Consortium Grants Made During the First Year, Showing Estimated Total Number of Chapter 1, Minority and Disadvantaged Per District

			Estimated Number of Students Who Are:		
District	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority
Anthony-Harper	82	1098	60.39	417.24	43.92
Axtell	15	90	9	21.6	0.9
Barnes-Hanover	49	401	40.1	136.34	0
Cedar Vale	20	204	34.68	91.8	10.2
Cheylin	28	219	4.38	50.37	0
Dexter	20	160	35.2	78.4	4.8
Dighton	39	401	28.07	60.15	8.02
Easton	58	653	32.65	261.2	32.65
Elkhart	56	585	99.45	93.6	81.9
Flinthills	30	234	46.8	28.08	7.02
Fowler	21	143	11.7	2850	0
Greeley	36	367	28.6	35.75	11.44
Greensburg	25	174	24.31	62.92	0
Haviland	25	174	29.58	76.56	0
Jetmore	31	246	27.06	81.18	4.92
Jewell	101	621	18.63	111.78	6.21
Kincaid (Crest)	27	291	29.1	87.3	2.91
Lebo-Waverly	49	491	49.1	137.48	0
Lewis	22	184	1.84	1.84	4.91
Meade	41	420	25.2	110.88	8.4
Midway-Denton	24	205	51.25	51.25	4.1
Mill Creek Valley	50	563	123.86	163.27	11.26
Minneola	22	209	14.63	106.59	0
Ness City	42	347	31.23	3.47	0.0694
North Central	32	168	23.52	85.68	0
Onaga-Havensville-Wheato	38	449	53.88	80.82	0
Oswego	45	461	4.61	4.61	0
Paradise (Natoma)	25	178	28.48	69.42	3.56
Pawnee Heights	20	160	40	19.2	1.6
Pike Valley	32	261	26.1	62.64	2.61
Plainville	32	261	26.1	62.64	2.61
Quinter	36	345	51.75	69	10.35
Riley	49	578	34.68	92.48	17.34
St. Francis	40	419	41.9	83.8	4.19
Smoky Hill	22	205	30.75	41	2.05
Sylvan Grove	23	220	22	66	0

Table 6
Total Number of Kansas School Staff and Students Potentially Impacted By Midlands Consortium Grants Made During the First Year, Showing Estimated Total Number of Chapter 1, Minority and Disadvantaged Per District

			Estimated Number of Students Who Are:		
			Eligible for	Eligible for	
District	Staff	Students	Chapter 1	Lunch Subsidy	Minority
Troy	36	393	19.65	66.81	3.93
Udall	42	384	37.248	71.04	0
Utica	15	87	9.57	9.57	0
Vermillion (Centralia)	47	302	18.12	12.08	3.02
Vermillion (Frankfort)	34	315	15.75	97.65	3.15
Victoria	35	397	27.79	99.25	3.97
WaKeeney		660	59.4	244.2	0
Wallace	32	298	17.88	98.34	1.3
Washington	41	418	238.26	83.6	154.66
Winchester	42	473	52.03	118.25	14.19
Woodson (Yates Center)	52	601	72.12	210.35	6.01
Totals	**1683**	**16513**	**1808.398**	**6967.48**	**478.1694**

Table 7
Total Number of School Staff and Students Potentially Impacted By Midlands Consortium Grants Made During the First Year, Showing Estimated Total Number of Chapter 1, Minority and Disadvantaged

			Estimated Number of Students Who Are:		
State	Staff	Students	Eligible for Chapter 1	Eligible for Lunch Subsidy	Minority
Oklahoma	3772	32984	4151	10940	10617
Mississippi	7124	107210	34182	74336	44423
Kansas	1683	16513	1808	6967	478
Totals	**12579**	**156707**	**40141**	**92243**	**55518**

Table 8
Summary of Data on the Audience for University of Kansas Staff Development Programs Supported by Star Schools Grant

Name	State	Location	Program Name	Number Teachers	Number Students	Eligible Ch p. 1	Live Viewers	Tape Viewers	Number of Schools/Sites	Number of Districts
Victoria	KS	rural	AIDS and STDs	32	297	yes		yes		1
Anthony	KS	rural	AIDS and STDs	80	1200			200		1
Winchester	KS	rural	AIDS and STDs	35	600	yes	8	2		1
Yates Center	KS	rural	AIDS and STDs	46	600	yes	yes			1
Anthony	KS	rural	COMETS	80	1200			12		1
Victoria	KS	rural	COMETS	38	397	yes	10	25		1
Lone Wolf	OK	rural	COMETS	19	260	yes	1	25		1
Falls Church	VA	urban	COMETS	19000	250000	yes	200			1
Green Bay	WI	urban	COMETS	1300	17500	yes	yes		85	18
Waterford	MI		Class Mgmt.				10			28
WaKeeny	KS	rural	Class Mgmt.	50	648	yes	7	2		1
Oxford	KS	rural	Class Mgmt.	38	435	yes	7	2		1
Ransom	KS	rural	Class Mgmt.	20	200	yes	3	2		1
Elkhart	KS	rural	Class Mgmt.	52	700	yes	7	2		1
Baileyville	KS	rural	Class Mgmt.	21	250	yes	6	2		1
Galena	KS	rural	Class Mgmt.	50	730	yes	12			1
Buffalo	KS	rural	Class Mgmt.	30	380	yes	10	yes		1
Eufaula	AL	suburban	Class Mgmt.	36	670	yes	5	10		2
Buffalo		rural	Class Mgmt.	35	380	yes	10			1
Caruthersville		rural	Class Mgmt.	110	1700	yes	23	5		1
Victoria	KS	rural	Fearless Math	32	397	yes	20			1
Anthony	KS	rural	Fearless Math	80	1200		8			1
Sidney	NE	rural	Fearless Math	20			yes			1
Ness City	KS	rural	Fearless Math	31	450	yes	7	17		1
McPherson	KS	rural	Life After HS				15			8
Abilene	KS	rural	Life After HS			no	10			12

Table 8
Summary of Data on the Audience for University of Kansas Staff Development Programs Supported by Star Schools Grant

Name	State	Location	Program Name	Number Teachers	Number Students	Eligible Chap. 1	Live Viewers	Tape Viewers	Number of Schools/Sites	Number of Districts
Fort Meyers	FL	urban	Life After HS	2000	43000	yes	29	40		1
Lawrence	KS	urban	Live After HS				2		22	1
Tacoma	WA	urban	Life After HS				1			1
Edinboro	PA		Life After HS	165			35		5	15
Columbia	SC	urban	Life After HS				193		21	1
Castlegar	CAN	rural	Life After HS	6	70	no	10	4		1
Omaha	NE	urban	Life After HS				115	10		1
Macomb	IL	rural	Life After HS	153	2333	yes	5	25		1
Ladysmith	WI	rural	Life After HS			yes	15	10		26
Scandia	KS	rural	Kansas Hist	32	288	yes	3		11	3
St. Francis	KS	rural	Kansas Hist	42	444	yes	4	6		1
Ransom	KS	rural	Kansas Hist	20	200	yes	3	1		1
Sabetha	KS	rural	Kansas Hist	80	1061	yes	4			1
Galena	KS	rural	Kansas Hist	50	730	yes	10			1
Victoria	KS	rural	Kansas Hist	34	325	yes	5	2		1
Argonia	KS	rural	Literacy	23	230	no	yes			1
Westminster	MD	rural	Literacy			yes	yes	yes		1
Midland	MI	urban	Literacy	615	8500	yes	15	15		1
Lawrence	KS	urban	Literacy	600	8500	yes	12			1
Creston	IA	rural	Literacy				yes		62	22
Marshall		rural	Literacy	189	2238	yes	228	28	7	1
Ransom	KS	rural	Literacy	20	200	yes	3	2		1
Steamboat Springs	CO	rural	Literacy	530	4420	yes	3	20	22	6
Luverne	MN	rural	Literacy	80	1100	yes	25	10		1
St. Joseph	MO	urban	Literacy				24			1
Sidney	NE	rural	Literacy	5			2	1		1

Table 8
Summary of Data on the Audience
for University of Kansas Staff Development
Porgrams Supported by Star Schools Grant

Name	State	Location	Program Name	Number Teachers	Number Student	Eligible Chap. 1	Live Viewers	Tape Viewers	Number of Schools/Sites	Number of Districts
Olean	NY		Literacy	1880		no	3		53	27
Ipswich	MA	suburban	Literacy	140	1600	yes	15			1
Brunswick	GA	suburban	Literacy	550	10000	yes		500		1
Grand Rapids	MI	urban	Literacy	750			220		75	10
Shoreham	NY	rural	Literacy	320	1960	no		15	2	10
Orlando	FL	urban	Literacy	2000	100000	yes		85		1
Stockton	CA	urban	Literacy	1000			10		5	100
Portland	OR	urban	Literacy	3000	53000	yes	5			1
Winchester	KS	rural	Literacy	32	500	yes	4			1
Raytown	MO	suburban	Literacy	650	8500	yes	15			1
Ransom	KS	rural	Mission	20	200	yes				1
Norton	KS	rural	Mission	40	750	yes	3	6		1
St. Joseph	MO	urban	Mission	800	14000	yes		100		1
Doylestown	PA	suburban	Mission	3000	75000	yes		50		1
Lewisburg	KS	rural	Mission	400	6000	yes	20	10		1
Denver	CO	suburban	Mission	1200	20500	yes		35		1
Troy	Ks	rural	Mission	33	380	yes		3		1
Victoria	KS	rural	Preschool	32	397	yes		yes		1
Yates Center	KS	rural	Preschool	46	600	yes		yes		1
Anthony	KS	rural	Preschool	80	1200	yes		yes		1
Springfield	MO	suburban	Preschool	1800	23300	yes		100		1
Luverne	MN	rural	Alcohol	80	1100	yes	100			1
Orrick	MO	rural	Alcohol	35	400	yes		72		1
Riley	KS	rural	Alcohol	40	600	yes		70		1
Garnett	KS	rural	Alcohol	90	1000	yes	15			1
St. Francis	KS	rural	Alcohol	42	444	yes	5	4		1

Table 8
Summary of Data on the Audience
for University of Kansas Staff Development
Programs Supported by Star Schools Grant

Name	State	Location	Program Name	Number Teachers	Number Students	Eligible Chap. 1	Live Viewers	Tape Viewers	Number of Schools/Sites	Number of Districts
Creve Coeur	MO	suburban	Alcohol	2000	23000			50	17	1
Miami	MO	rural	Alcohol	165	2300	yes		100		1
Lawrence	KS	urban	Admin.	600	8500	yes	4		22	1
Totals				**46704**	**709064**		**1544**	**1680**		354

LEGEND

Abbreviation:	Program Name:
COMETS	Career-Oriented Modules to Explore the Teaching of Science
Strategies	Learning Strategies
Fearless Math	Fearless Math
Preschool	Preschool Assessment
AIDS and STD	AIDS and Socially Transmitted Diseases
Kansas History	Kansas History
Literacy	Literacy Through Literature
Class Mgmt.	Classroom Management
Mission	Mission Possible: New Orientations for Instrumental Music and Art Programs
Life After HS	Is There Life After High School?

Table 9
Mississippi Evaluation of Courses By Satellite
Summary Table Enabling Comparisons Among Courses
On Percentages of Students Responding to Selected Items

Items:	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7	Course 8	Course 9	Course 10	Average
	Course Number										
Percent Minority	90	35	14	51	77	20	32	37	44	29	57
Mother Did Not Finish HS	41	24	21	21	18	10	9	42	23	29	26
Mother College Graduate	14	35	29	31	41	55	27	17	38	29	28
Father Did Not Finish HS	32	24	29	27	35	10	30	46	21	10	28
Father College Graduate	19	39	21	31	41	70	27	13	31	19	30
English Spoken at Home	83	95	100	93	88	95	91	96	86	86	90
Interest Motivation	13	46	50	41	6	5	27	21	2	19	29
Prepare for College	31	18	7	38	76	90	46	33	36	10	33
Rank Among Best	11	43	71	38	94	84	82	71	50	57	60
Internal Attribution-Success	68	85	93	83	100	100	86	83	73	81	80
Internal Attribution-Low Ach	72	84	71	76	94	65	82	75	72	81	76
Luck More Than Work	34	10	36	8	6	11	0	8	13	14	13
Plan to Attend College	61	90	100	73	100	100	100	92	92	95	85
Need This Course for College	26	33	7	3	24	20	14	4	69	52	32
Percent Agreement											
Broadcast Held Attention	45	35	7	32	65	10	50	42	29	19	36
Prefer Satellite	39	29	14	21	18	15	14	4	8	5	24
Too Much Material	38	27	57	26	29	35	46	54	36	48	33
Adequate Test Guidance	59	46	21	66	82	65	50	38	38	33	57
Too Easy to Fall Behind	51	46	57	49	59	60	91	54	55	71	53
Class Could Not Keep Up	29	25	29	22	41	20	50	42	47	67	28
Broadcasts-More Interesting	51	54	14	44	71	15	41	33	35	29	45
Learned From Test Mistakes	59	46	29	67	94	60	55	29	46	48	58

Table 9
Mississippi Evaluation of Courses By Satellite
Summary Table Enabling Comparisons Among Courses
On Percentages of Students Responding to Selected Items

Items:	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7	Course 8	Course 9	Course 10	Average
	Course Number										
Percent Agreement											
Confidence-Same Course	42	40	29	51	65	65	59	29	48	48	47
Confidence-Next Course	33	20	29	28	29	40	32	21	29	38	29
Trouble Getting Answers	36	44	29	33	12	20	46	54	42	52	36
Learned From Computer	66	79	93	44	N/A	N/A	27	17	38	24	51
Uncomfortable About Calling	21	15	43	42	24	50	36	43	44	43	33
Equipment Problems	25	24	36	19	18	5	14	25	56	67	23
Teaching Partner-Order	4[illegible]	75	79	75	88	90	68	79	77	62	69
Different Teaching Methods	50	60	29	58	77	80	68	42	58	52	57
Go Slower, Learn More	42	42	79	52	6	55	50	58	56	67	50
There Is No One to Help You	29	34	36	18	18	5	27	35	33	48	25
Grading System Fair	57	74	71	63	82	85	77	42	58	52	64
Expected More Communication	42	59	57	49	24	20	27	63	58	52	47
Expected More Computer	58	30	36	48	24	0	64	65	54	67	47
Harder Than Non-Satellite	12	42	43	29	41	60	81	54	83	76	36
More Homework Than Non-Sat.	12	26	43	22	47	35	77	71	30	67	28
Learned As Much As Expected	69	45	77	59	82	70	41	25	53	29	57
Would Take Another Satellite	20	26	57	28	41	20	23	29	10	14	25
Software Once/Week or More	60	86	86	18	0	10	14	33	33	29	40
On-Air At Least Once/Month	48	41	43	56	82	45	73	49	43	43	43
Off-Air At Least Once/Month	44	52	50	37	71	25	52	38	60	33	44
Study Less Than 2 Hrs/Wk	58	59	29	61	53	40	50	37	35	33	55
Expecting an A in This Course	32	31	21	38	6	60	18	4	23	14	32
Typically Get A's	21	74	86	58	100	100	86	54	67	62	56

Table 9

Mississippi Evaluation of Courses By Satellite

Summary Table Enabling Comparisons Among Courses

On Percentages of Students Responding to Selected Items

	Course Number										
	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7	Course 8	Course 9	Course 10	Average
Among Best College Ability	15	38	29	30	59	80	36	37	38	38	31
Own Work Is Excellent	28	14	0	18	41	10	18	21	19	19	20
Very Certain of Own Ability	39	60	36	56	71	75	68	79	69	60	56
Definitely Recommend Course	42	36	56	71	75	68	79	25	60	52	40
Further Study of Subject	29	46	36	47	53	70	59	42	30	20	42
Percent Agreement											
Opportunity-Challenging	66	79	93	44	88	90	52	79	74	68	69
Opportunity-Learn Technology	21	15	43	42	71	75	54	67	67	65	65
Promotes School Interaction	25	24	36	19	71	70	77	63	46	35	57
Preview of College Work	46	75	79	75	82	95	95	71	73	70	59
Fortunate to Take This Course	50	60	29	58	65	50	86	46	46	25	62
Fine Instructors	42	42	79	52	65	40	68	38	35	15	44
Teachers Get New Ideas	29	34	36	18	77	70	77	54	44	30	55
Too Much Expected											
Self-Motivation	16	19	57	23	12	25	27	37	40	40	23
Study Skill	13	29	43	21	18	30	36	50	28	20	23
Memorization	16	32	64	32	27	35	19	42	20	15	28

Table 10
All Students

ITEM #1: Racial/Ethnic Background

Label	Percent	Cum %
American Indian	1.0	1.0
Asian/Pacific	.7	1.7
Black	52.1	54.2
Hispanic	2.4	56.6
White	42.9	99.8

ITEM #2: Mother-Highest Grade Completed

Label	Percent	Cum %
Eighth or less	3.9	4.0
Did not finish HS	21.9	26.1
HS Graduate	30.8	57.2
Started College	13.8	71.2
College Graduate	28.4	99.8

ITEM #3: Father-Highest Grade Completed

Label	Percent	Cum %
Eighth or less	6.8	7.0
Did not finish HS	20.0	27.6
HS Graduate	28.0	56.5
Started College	12.1	69.0
College Graduate	29.6	99.5

ITEM #4: English Primary Language At Home

Label	Percent	Cum %
No	8.0	8.0
Yes	89.9	98.1

ITEM #5: Motivation For Enrolling

Label	Percent	Cum %
Interest	28.5	28.6
Prepare for college	32.6	61.4
No other course	5.6	67.1
Persuaded	10.8	77.9
Other	21.7	99.7

ITEM #6: Responsible For Your Enrollment In Course

Label	Percent	Cum %
Own decision	43.1	43.4
Family	4.8	48.2
Admin/Counselor	34.9	83.3
Teacher	11.6	95.0
Other students	4.4	99.5

ITEM #7: Rank In Graduating Class

Label	Percent	Cum %
Among best	39.8	40.1
Above average	20.1	60.2
Average	35.4	95.9
Below average	3.4	99.3
Poorest	.3	99.7

ITEM #8: Attribution When You Do Well

Label	Percent	Cum %
Worked hard	50.9	51.1
Good in that subject	29.1	80.3
Easy course	12.0	92.3
Lucky	7.2	99.5

ITEM #9: Attribution When You Do Poorly

Label	Percent	Cum %
Didn't work hard	65.8	66.2
Not good in subject	9.9	76.1
Difficult course	18.6	94.8
Bad luck	4.6	99.5

ITEM #10: Luck More Important Than Work

Label	Percent	Cum %
Strongly agree	5.6	5.7
Agree	7.9	13.8
Disagree	33.0	47.4
Strongly disagree	43.1	91.3
Not sure	8.2	99.7

ITEM #22: Enroll If Non-Satellite

Label	Percent	Cum %
Yes	61.9	63.0
No	15.4	78.6
Do not know	20.3	99.3

ITEM #23: Plan To Attend College

Label	Percent	Cum %
Yes	84.6	85.1
No	6.3	91.4
Do not know	8.2	99.7

ITEM #24: Need For College

Label	Percent	Cum %
Yes	31.3	31.5
No	47.9	79.7
Do not know	16.2	96.0

ITEM #25: Broadcasts Held Attention

Label	Percent	Cum %
Strongly agree	5.1	5.1
Agree	30.8	36.0
Neither	24.3	60.4
Disagree	24.3	84.7
Strongly disagree	12.3	97.1
Not sure	2.7	99.8

ITEM #26: Prefer Satellite

Label	Percent	Cum %
Strongly agree	8.5	8.5
Agree	15.2	23.8
Neither	18.8	42.6
Disagree	25.3	67.9
Strongly disagree	23.1	90.9
Not sure	9.1	100.0

ITEM #27: Too Much Material

Label	Percent	Cum %
Strongly agree	13.9	13.9
Agree	19.0	32.9
Neither	21.7	54.7
Disagree	33.2	88.0
Strongly disagree	7.5	95.5
Not sure	4.3	99.8

ITEM #28: Adequate Guidance To Prepare For Tests

Label	Percent	Cum %
Strongly agree	21.4	21.4
Agree	35.4	56.9
Neither	17.9	75.0
Disagree	12.6	87.7
Strongly disagree	8.4	96.1
Not sure	3.9	100.0

ITEM #29: Too Easy To Fall Behind

Label	Percent	Cum %
Strongly agree	22.4	22.4
Agree	30.3	52.7
Neither	15.7	68.5
Disagree	19.0	87.5
Strongly disagree	8.0	95.5
Not sure	4.3	99.8

ITEM #30: Could Not Keep Up With TV Instructor

Label	Percent	Cum %
Strongly agree	12.1	12.2
Agree	15.7	27.9
Neither	21.7	49.7
Disagree	33.2	82.9
Strongly disagree	11.5	94.3
Not sure	5.6	100.0

ITEM #31: Broadcasts Made It More Interesting

Label	Percent	Cum %
Strongly agree	16.1	16.1
Agree	28.7	44.9
Niether	20.2	65.1
Disagree	17.4	82.5
Strongly disagree	13.3	95.9
Not sure	3.9	99.8

ITEM #32: Learned From Mistakes On Tests

Label	Percent	Cum %
Strongly agree	15.6	15.6
Agree	42.4	57.9
Neither	19.1	77.1
Disagree	10.4	87.5
Strongly disagree	8.5	96.1
Not sure	3.8	99.8

ITEM #33: Confidence To Take Same Course In College

Label	Percent	Cum %
Strongly agree	13.2	13.2
Agree	33.7	46.9
Neither	16.6	63.5
Disagree	12.8	76.4
Strongly disagree	15.0	91.4
Not sure	8.5	100.0

ITEM #34: Confidence To Take Next Level Course In College

Label	Percent	Cum %
Strongly agree	7.7	7.7
Agree	20.9	28.6
Neither	19.1	47.9
Disagree	21.9	69.8
Strongly disagree	17.8	87.7
Not sure	12.3	100.0

ITEM #35: Trouble Getting Questions Answered

Label	Percent	Cum %
Strongly agree	12.0	12.0
Agree	24.1	36.1
Neither	21.4	57.5
Disagree	30.3	87.8
Strongly disagree	10.4	98.3
Not sure	1.7	100.0

ITEM #36: I Learned From The Computer Drills

Label	Percent	Cum %
Strongly agree	18.5	18.7
Agree	32.1	51.3
Neither	21.5	73.1
Disagree	9.7	83.0
Strongly disagree	11.5	94.6
Not sure	5.3	100.0

ITEM #37: Uncomfortable Calling TV Instructor

Label	Percent	Cum %
Strongly agree	12.5	12.5
Agree	20.5	33.1
Neither	25.3	58.5
Disagree	22.7	81.3
Strongly disagree	11.1	92.5
Not sure	7.4	99.8

ITEM #38: Equipment Problems

Label	Percent	Cum %
Strongly agree	10.6	10.6
Agree	12.8	23.4
Neither	18.8	42.2
Disagree	34.9	77.1
Strongly disagree	16.6	93.7
Not sure	6.0	99.7

ITEM #39: Order Maintained By Teaching Partner

Label	Percent	Cum %
Strongly agree	28.9	28.9
Agree	40.3	69.2
Neither	14.0	83.2
Disagree	7.4	90.6
Strongly disagree	7.2	97.8
Not sure	2.1	99.8

ITEM #40: Different Teaching Methods

Label	Percent	Cum %
Strongly agree	12.8	12.9
Agree	43.8	56.8
Neither	19.0	75.8
Disagree	11.3	87.7
Strongly disagree	7.0	94.7
Not sure	5.0	99.7

ITEM #41: Pacing Too Fast

Label	Percent	Cum %
Strongly agree	19.5	19.5
Agree	30.3	49.8
Neither	20.5	70.4
Disagree	17.4	87.8
Strongly disagree	7.5	95.4
Not sure	4.6	100.0

ITEM #42: There Is No One To Help You

Label	Percent	Cum %
Strongly agree	9.9	10.0
Agree	14.9	24.9
Neither	19.7	44.7
Disagree	31.6	76.5
Strongly disagree	18.8	95.4
Not sure	4.6	100.0

ITEM #43: Grading System Fair

Label	Percent	Cum %
Strongly agree	21.0	21.0
Agree	43.1	64.1
Neither	17.1	81.2
Disagree	7.0	88.2
Strongly disagree	7.5	95.7
Not sure	4.1	99.8

ITEM #44: Expected More Communication With Instructor

Label	Percent	Cum %
Strongly agree	15.6	15.6
Agree	31.8	47.4
Neither	25.6	73.1
Disagree	17.3	90.4
Strongly disagree	3.9	94.3

ITEM #45: Expected More Computer Use

Label	Percent	Cum %
Strongly agree	23.4	23.6
Agree	23.1	46.8
Neither	23.6	70.6
Disagree	17.6	88.3
Strongly disagree	5.1	93.5
Not sure	6.5	100.0

ITEM #46: Difficulty Compared To Same Course, Non-Satellite

Label	Percent	Cum %
Harder	35.9	36.0
About same	26.5	62.6
Easier	19.7	82.3
Uncertain	16.8	99.1

ITEM #47: Homework Compared To Same Course, Non-Satellite

Label	Percent	Cum %
More	27.5	27.6
About same	28.9	56.5
Less	29.2	85.8
Uncertain	15.1	99.5

ITEM #48: Learned Compared To Expectations

Label	Percent	Cum %
A great deal	29.7	29.7
As expected	26.8	56.6
Not as expected	30.3	86.8
Not much	9.7	96.6
Nothing	3.4	100.0

ITEM #49: Would Take Another Satellite Course

Label	Percent	Cum %
Yes definitely	25.3	25.3
Yes as last resort	13.7	39.0
No	21.9	60.9
Depends on course	37.4	98.3
Uncertain	1.5	99.8

ITEM #50: How Often Did You Use Software

Label	Percent	Cum %
Never	19.5	19.6
Once a month	16.2	35.8
2-3 times a month	16.1	52.0
Once a week	13.2	65.2
2-3 times a week	26.8	92.1
Not applicable	7.9	100.0

ITEM #51: How Often Did You Use Electronic Mailbox

Label	Percent	Cum %
Never	45.1	45.8
Once a month	3.8	49.7
2-3 times a month	4.3	54.0
Once a week	2.2	56.3
2-3 times a week	1.2	57.5
Not applicable	41.7	99.8

ITEM #52: Call In Questions During Broadcast

Label	Percent	Cum %
Never	45.1	45.8
Once a month	3.8	49.7
2-3 times a month	4.3	54.0
Once a week	2.2	56.3
2-3 times a week	1.2	57.5
Not applicable	41.7	99.8

ITEM #53: Call In Questions At Other Times During The School Day

Label	Percent	Cum %
Never	51.6	52.2
Once a month	21.2	73.6
2-3 times a month	9.2	82.9
Once a week	9.6	92.6
2-3 times a week	3.6	96.2
Not applicable	3.8	100.0

ITEM #54: Call In Questions From Home At Night

Label	Percent	Cum %
Never	75.0	75.8
Once a month	9.7	85.7
2-3 times a month	4.1	89.8
Once a week	3.4	93.3
2-3 times a week	2.1	95.3
Not applicable	4.6	100.0

ITEM #55: How Often Did You Use Voice Recognition Unit

Label	Percent	Cum %
Never	43.2	43.9
Once a month	9.9	54.0
2-3 times a month	5.6	59.7
Once a week	5.6	65.5
2-3 times a week	3.8	69.3
Not applicable	30.1	99.8

ITEM #56: Hours Studying Per Week

Label	Percent	Cum %
Less than 2	54.9	55.0
2-3 hours	25.8	80.8
4-5 hours	13.2	94.0
6-7 hours	4.1	98.1
More	1.5	99.7

ITEM #57: Expected Grade In This Course

Label	Percent	Cum %
A	31.6	61.8
B	35.0	67.0
C	21.8	88.8
D	6.5	95.4
F	4.1	99.5

ITEM #58: Grades Capable Of Getting

Label	Percent	Cum %
A	56.4	56.5
B	26.0	82.7
C	13.2	95.9
D	2.6	98.5
F	1.2	99.7

ITEM #59: Your Ability To Complete College

Label	Percent	Cum %
Among the best	30.9	31.0
Above average	35.2	66.4
Average	29.1	95.5
Below average	3.2	98.8
Poorest	1.2	100.0

ITEM #60: Your Opinion Of Your Work

Label	Percent	Cum %
Excellent	19.8	19.9
Good	50.3	70.4
Average	24.4	95.0
Below average	3.4	98.5
Very poor	1.2	99.7

ITEM #61: Certainty About Own Ability

Label	Percent	Cum %
Very certain	55.2	55.7
Somewhat certain	32.8	88.8
Uncertain	5.8	94.7
Very uncertain	3.1	97.8
Unsure	2.1	99.8

ITEM #62: Recommend Course To Other Students

Label	Percent	Cum %
Yes	39.7	40.1
No	21.9	62.2
Depends on student	31.5	94.0
Uncertain	5.1	99.5

ITEM #63: Further Study Of Subject

Label	Percent	Cum %
Yes	41.4	41.9
No	28.5	70.9
Uncertain	26.5	97.7

ITEM #64: Opportunity To Take More Challenging Courses

Label	Percent	Cum %
Strongly agree	27.0	27.5
Agree	40.2	68.5
Neither	17.1	85.9
Disagree	5.5	91.5
Strongly disagree	1.7	93.2
Not sure	6.2	99.5

ITEM #65: Opportunity To Learn The Latest Technology

Label	Percent	Cum %
Strongly agree	19.3	19.5
Agree	44.6	64.6
Neither	20.3	85.1
Disagree	7.9	93.1
Strongly disagree	2.1	95.2
Not Sure	4.8	100.0

ITEM #66: Promotes Interaction Among Schools

Label	Percent	Cum %
Strongly agree	16.1	16.3
Agree	40.5	57.3
Neither	20.5	78.0
Disagree	10.9	89.1
Strongly disagree	4.4	93.6
Not sure	6.2	99.8

ITEM #67: Preview of College Work

Label	Percent	Cum %
Strongly agree	19.8	20.0
Agree	38.3	58.7
Neither	19.0	77.9
Disagree	10.3	88.3
Strongly disagree	5.0	93.3
Not sure	6.5	99.8

ITEM #68: Fortunate To Take This Course

Label	Percent	Cum %
Strongly agree	28.2	28.5
Agree	33.0	61.9
Neither	20.2	82.4
Disagree	9.4	91.9
Strongly disagree	3.8	95.7
Not sure	4.1	99.8

ITEM #69: Fortunate To Have Such Fine Instructors

Label	Percent	Cum %
Strongly agree	13.3	13.5
Agree	30.6	44.4
Neither	28.7	73.4
Disagree	12.8	86.4
Strongly disagree	9.4	95.9
Not sure	4.1	100.0

ITEM #70: Teachers Get New Ideas

Label	Percent	Cum %
Strongly agree	17.3	17.5
Agree	37.4	55.4
Neither	21.2	76.8
Disagree	10.4	87.4
Strongly disagree	6.0	93.4
Not sure	6.2	99.7

ITEM #71: Too Much Self-Motivation Expected

Label	Percent	Cum %
Too much	23.1	23.4
About right	58.1	82.2
Too little	8.2	90.5
Do not know	7.7	98.3

ITEM #72: Too Much Study Skill Expected

Label	Percent	Cum %
Too much	22.2	22.7
About right	60.7	84.8
Too little	6.2	91.1
Do not know	8.0	99.3

ITEM #73: Too Much Memorization Expected

Label	Percent	Cum %
Too much	26.3	28.0
About right	51.6	82.9
Too little	6.2	89.5
Do not know	9.4	99.5

Table 11
Teaching Partner

ITEM #1: Attended Distance Learning Conference

Label	Percent	Cum %
Yes	80.0	80.0
No	20.0	100.0

ITEM #2: Teaching Responsibility

Label	Percent	Cum %
Mathematics	9.1	9.1
Vocational/Business	3.6	12.7
Social Science	7.3	20.0
Special Education	1.8	21.8
PE, Music, Art	3.6	25.5
Foreign Language	7.3	32.7
English/Comm.	20.0	52.7
Science	16.4	69.1
Guidance/Librarian	18.2	87.3
Other	12.7	100.0

ITEM #3: Number of Years You Have Been Teaching

Label	Percent	Cum %
1 year or less	1.8	1.8
2-3 years	1.8	3.6
4-6 years	10.9	14.5
7-9 years	9.1	23.6
10-12 years	18.2	41.8
More than 12	52.7	94.5
Not applicable	5.5	100.0

ITEM #4: Grade Levels in Your School

Label	Percent	Cum %
Junior High	1.8	1.8
10-12	10.9	12.7
9-12	36.4	[illegible]
All secondary	27.3	
K-12	23.6	

ITEM #5: Was Satellite Course Part Of Your Teaching Load

Label	Percent	Cum %
Yes	87.3	87.3
No	12.7	100.0

ITEM #6: Where Were The Programs Viewed

Label	Percent	Cum %
Regular classroom	25.5	25.5
Another classroom	45.5	70.9
Library/media center	20.0	90.9
Other	9.1	100.0

ITEM #7: Enrollment In Your Class

Label	Percent	Cum %
1-5	12.7	12.7
6-10	50.9	63.6
11-15	27.3	90.9
16-20	3.6	94.5
31-35	1.8	96.4
36-40	1.8	98.2
More than 41	1.8	100.0

ITEM #9: Reason For Initiating Course By Satellite

Label	Percent	Cum %
No certified teacher	5.5	6.0
Cost of hiring	10.9	18.0
State requirements	1.8	20.0
Increase offerings	56.4	82.0
Other	16.4	100.0

ITEM #10-20: Courses Offered By Satellite In Your Building

Label	Percent
Basic English/Reading	20.0
German I	16.4
German II	1.8
Spanish	30.9
Russian	3.6
Economics	5.5
American Government	7.3
Physics	5.5
Chemistry	7.3
Calculus	3.6
Trigonometry	5.5

ITEM #21: Recommend Courses

Label	Percent	Cum %
Yes	92.7	92.7
Uncertain	7.3	100.0

ITEM #22: Proportion Of Students Who Receive Chapter I In Class

Label	Percent	Cum %
0-9%	76.4	76.4
10-19%	1.8	78.2
20-29%	5.5	83.6
30-39%	1.8	85.5
50-59%	3.6	89.1
80-89%	1.8	90.9
90-100%	9.1	100.0

ITEM #23: Proportion Of Minority Students In Class

Label	Percent	Cum %
0-9%	32.7	33.3
10-19%	9.1	42.6
20-29%	5.5	48.1
30-39%	1.8	50.0
40-49%	7.3	57.4
50-59%	5.5	63.0
60-69%	3.6	66.7
80-89%	9.1	75.9
90-100%	23.6	100.0

ITEM #24: Proportion Of Students Behind In Reading In Class

Label	Percent	Cum %
0-9%	67.3	68.5
10-19%	1.8	70.4
20-29%	5.5	75.9
30-39%	1.8	77.8
40-49%	3.6	81.5
50-59%	3.6	85.2
60-69%	1.8	87.0
80-89%	7.3	94.4
90-100%	5.5	100.0

ITEM #25: Proportion Of Students Behind In Math In Class

Label	Percent	Cum %
0-9%	70.9	72.2
10-19%	1.8	74.1
20-29%	5.5	79.6
30-39%	1.8	81.5
40-49%	1.8	83.3
50-59%	3.6	87.0
60-69%	1.8	88.9
70-79%	3.6	92.6
80-89%	3.6	96.3
90-100%	3.6	100.0

ITEM #26: Proportion Of Students Likely To Finish High School In Class

Label	Percent	Cum %
0-9%	9.1	9.1
50-59%	3.6	12.7
60-69%	1.8	14.5
70-79%	5.5	20.0
80-89%	5.5	25.5
90-100%	74.5	100.0

ITEM #27: Overall Quality Of Satellite Course

Label	Percent	Cum %
Very satisfied	45.5	45.5
Satisfied	41.8	87.3
Neither	9.1	96.4
Dissatisfied	3.6	100.0

ITEM #28: Technical Or Production Quality

Label	Percent	Cum %
Very satisfied	69.1	69.1
Satisfied	27.3	96.4
Neither	3.6	100.0

ITEM #29: Quality Compared To Own Teaching

Label	Percent	Cum %
Very satisfied	43.6	44.4
Satisfied	38.2	83.3
Neither	9.1	92.6
Dissatisfied	5.5	98.1
Not applicable	1.8	100.0

ITEM #30: Level Of Difficulty

Label	Percent	Cum %
Very satisfied	23.6	24.1
Satisfied	55.6	79.6
Neither	12.7	92.6
Dissatisfied	7.3	100.0

ITEM #31: Content

Label	Percent	Cum %
Very satisfied	40.0	40.0
Satisfied	50.9	90.9
Neither	5.5	96.4
Dissatisfied	3.6	100.0

ITEM #32: Knowledge Gained

Label	Percent	Cum %
Very satisfied	23.6	23.6
Satisfied	50.9	74.5
Neither	9.1	83.6
Dissatisfied	7.3	90.9
Very dissatisfied	7.3	98.2
Not applicable	1.8	100.0

ITEM #33: Access To Technical Support

Label	Percent	Cum %
Very satisfied	40.0	40.0
Satisfied	50.9	90.9
Neither	9.1	100.0

ITEM #34: Access To Content Support

Label	Percent	Cum %
Very satisfied	45.5	45.5
Satisfied	38.2	83.6
Neither	10.9	94.5
Dissatisfied	5.5	100.0

ITEM #35: Computer-Assisted Learning

Label	Percent	Cum %
Very satisfied	38.2	38.9
Satisfied	29.1	68.5
Neither	14.5	83.3
Dissatisfied	5.5	88.9
Very dissatisfied	3.6	92.6
Not applicable	7.3	100.0

ITEM #36: Interactive Component

Label	Percent	Cum %
Very satisfied	21.8	21.8
Satisfied	47.3	69.1
Neither	18.2	87.3
Dissatisfied	9.1	96.4
Very dissatisfied	1.8	98.2
Not applicable	1.8	100.0

ITEM #37: Training You Received

Label	Percent	Cum %
Very satisfied	18.2	18.2
Satisfied	52.7	70.9
Neither	16.4	87.3
Dissatisfied	1.8	89.1
Not applicable	10.9	100.0

ITEM #38: Being A Teaching Partner Was A Good Experience

Label	Percent	Cum %
Very good	47.3	47.3
Good	34.5	81.8
Bad	5.5	87.3
Undecided	12.7	100.0

ITEM #39: Did You Volunteer To Be A Teaching Partner

Label	Percent	Cum %
Yes	40.0	40.0
No	58.2	98.2

ITEM #40: Was A Phone Available

Label	Percent	Cum %
Yes	74.5	74.5
No	10.9	85.5
Sometimes	10.9	96.4
Not applicable	3.6	100.0

ITEM #41: Phone Location

Label	Percent	Cum %
Where we viewed	80.0	80.0
Main office	7.3	87.3
Other	7.3	94.5
No phone available	5.5	100.0

ITEM #42: Did the Office of Distance Learning Provide Computers?

Label	Percent	Cum %
Yes, all of them	21.8	21.8
Yes, some of them	25.5	47.3
No	52.7	100.0

ITEM #43: Type Of Computers

Label	Percent	Cum %
All Apple II	60.0	60.0
IBM	14.5	74.5
Apple & IBM	10.9	85.5
Mac & Apple	1.8	87.3
Not applicable	12.7	100.0

ITEM #44: Ratio Of Students To Computers

Label	Percent	Cum %
One per computer	12.7	14.0
Two	32.7	50.0
Three	14.5	66.0
Four	7.3	74.0
Five	21.8	98.0

ITEM #45: How Often Did You Use Software

Label	Percent	Cum %
Never	7.3	7.3
About once/month	27.3	34.5
2-3 times/month	14.5	49.1
Once a week	10.9	60.0
2-3 times/week	29.1	89.1
Not applicable	10.9	100.0

ITEM #46: How Often Did You Use Electronic Mailbox

Label	Percent	Cum %
Never	54.5	54.5
2-3 times/month	1.8	56.4
Not applicable	43.6	100.0

ITEM #47: Call In Questions During Broadcast

Label	Percent	Cum %
Never	29.1	29.1
About once/month	41.8	70.9
2-3 times/month	18.2	89.1
Once a week	3.6	92.7
2-3 times/week	1.8	94.5
Not applicable	5.5	100.0

ITEM #48: Call In Questions At Other Times During The School Day

Label	Percent	Cum %
Never	34.5	35.2
About once/month	30.9	66.7
2-3 times/month	25.9	92.6
Once a week	5.5	98.1
2-3 times/week	1.8	100.0

ITEM #49: Call In Questions From Home At Night

Label	Percent	Cum %
Never	56.4	59.6
About once/month	21.8	82.7
2-3 times/month	12.7	96.2
Once a week	1.8	98.1
Not applicable	1.8	100.0

ITEM #50: How Often Did You Use The Voice Recognition Unit

Label	Percent	Cum %
Never	23.6	23.6
About once/month	50.9	74.5
2-3 times/month	18.2	92.7
Once a week	7.3	100.0

ITEM #51: Opportunity To Take More Challenging Courses

Label	Percent	Cum %
Strongly agree	69.1	69.1
Agree	27.3	96.4
Neither	3.6	100.0

ITEM #52: Opportunity To Learn The Latest Technology

Label	Percent	Cum %
Strongly agree	52.7	52.7
Agree	41.8	94.5
Neither	1.8	96.4
Disagree	3.6	100.0

ITEM #53: Promotes Interaction Among Schools

Label	Percent	Cum %
Strongly agree	25.5	25.5
Agree	43.6	69.1
Neither	14.5	83.6
Disagree	12.7	96.4
Not sure	3.6	100.0

ITEM #54: Preview Of College Work

Label	Percent	Cum %
Strongly agree	45.5	45.5
Agree	34.5	80.0
Neither	16.4	96.4
Disagree	3.6	100.0

ITEM #55: Fortunate To Have Such Fine Instructors

Label	Percent	Cum %
Strongly agree	27.3	27.8
Agree	50.9	79.6
Neither	16.4	96.3
Disagree	1.8	98.1
Not sure	1.8	100.0

ITEM #56: Teachers Get New Ideas

Label	Percent	Cum %
Strongly agree	32.7	32.7
Agree	43.6	76.4
Neither	20.0	96.4
Disagree	1.8	98.2
Not sure	1.8	100.0

ITEM #57: Benefit From Networking

Label	Percent	Cum %
Strongly agree	23.6	23.6
Agree	50.9	74.5
Neither	18.2	92.7
Disagree	7.3	100.0

ITEM #58: Too Much Self-Motivation Expected

Label	Percent	Cum %
Too much	16.4	16.4
About right	76.4	92.7
Too little	1.8	94.5
Do not know	5.5	100.0

ITEM #59: Too Much Study Skill Expected

Label	Percent	Cum %
Too much	14.5	14.5
About right	74.5	89.1
Too little	3.6	92.7
Do not know	7.3	100.0

ITEM #60: Too Much Memorization Expected

Label	Percent	Cum %
Too much	14.5	14.5
About right	78.2	92.7
Too little	1.8	94.5
Do not know	5.5	100.0

ITEM #61: Motivation Required Was A Problem

Label	Percent	Cum %
Serious problem	21.8	21.8
Problem not serious	45.5	67.3
Not a problem	27.3	94.5
Not applicable	5.5	100.0

ITEM #62: Instructor Response Speed Was A Problem

Label	Percent	Cum %
Serious problem	18.2	18.2
Problem not serious	47.3	65.5
Not a problem	34.5	100.0

ITEM #63: Lack Of Feedback Was A Problem

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	45.5	52.7
Not a problem	47.3	100.0

ITEM #64: Lack Of Interaction With TV Instructor

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	38.2	45.5
Not a problem	54.5	100.0

ITEM #65: Inadequate Technical Training Was A Problem

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	23.6	30.9
Not a problem	69.1	100.0

ITEM #66: Inadequate Content Training Was A Problem

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	25.5	32.7
Not a problem	63.6	96.4
Not applicable	3.6	100.0

ITEM #67: Roles Uncomfortable For Teaching Partners

Label	Percent	Cum %
Serious problem	3.6	3.6
Problem not serious	18.2	21.8
Not a problem	72.7	94.5
Not applicable	5.5	100.0

ITEM #68: Unforeseen Costs Of Course Were A Problem

Label	Percent	Cum %
Serious problem	10.9	10.9
Problem not serious	25.5	36.4
Not a problem	52.7	89.1
Not applicable	10.9	100.0

ITEM #69: Equipment Malfunctions Were A Problem

Label	Percent	Cum %
Serious problem	3.6	3.6
Problem not serious	30.9	34.5
Not a problem	61.8	96.4
Not applicable	3.6	100.0

ITEM #70: Scheduling Was A Problem

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	43.6	50.9
Not a problem	49.1	100.0

ITEM #71: Inflexibility Of Courses Was A Problem

Label	Percent	Cum %
Serious problem	7.3	7.3
Problem not serious	20.0	27.3
Not a problem	67.3	94.5
Not applicable	5.5	100.0

ITEM #72: Disappointment With Course Quality

Label	Percent	Cum %
Serious problem	3.6	3.7
Problem not serious	5.5	9.3
Not a problem	81.8	92.6
Not applicable	7.4	100.0

Table 12
Principals

ITEM #1: Attended Distance Learning Conference

Label	Percent	Cum %
Yes	51.0	51.0
No	46.9	98.0

ITEM #2: Building Enrollment

Label	Percent	Cum %
200-299	8.2	8.5
300-399	28.6	38.3
400-599	2.0	40.4
700-799	36.7	78.7
800-999	8.2	87.2
1000 or more	12.2	100.0

ITEM #3: Years As Principal

Label	Percent	Cum %
1 or less	6.1	6.1
2-3	22.4	28.6
4-6	24.5	53.1
7-9	14.3	67.3
10-12	6.1	73.5
13-15	6.1	79.6
15 or more	20.4	100.0

ITEM #4: Grade Levels In Your Building

Label	Percent	Cum %
Middle school	2.0	2.0
Junior high	4.1	6.1
10-12	16.3	22.4
9-12	49.0	71.4
All secondary	12.2	83.7
K-12	16.3	100.0

ITEM #5: Staff In Building

Label	Percent	Cum %
5 or less	2.0	2.0
6-10	2.0	4.0
11-20	8.2	12.2
21-40	55.1	67.3
41-80	30.6	98.0
81-100	2.0	100.0

ITEM #6: Students Per Grade

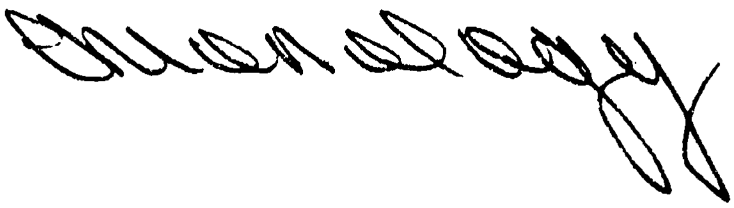
Label	Percent	Cum %
21-40	8.2	8.2
41-60	10.2	18.4
61-80	14.3	32.7
81-100	22.4	55.1
101-200	36.7	91.8
201-400	8.2	100.0

ITEM #7: Satellite Signal Reception

Label	Percent	Cum %
C-Band	10.2	11.9
KU-Band	8.2	21.4
Both	40.8	69.0
Not sure	24.5	97.6

ITEM #8: Reason For Initiating Course By Satellite

Label	Percent	Cum %
No certified teacher	4.1	4.1
Cost of hiring	16.3	20.4
Rejected joint hire	2.0	22.4
State requirements	2.0	24.5
Satisfy student	57.1	83.7
Increase offerings	16.3	100.0



ITEM #9: Learn About Satellite

Label	Percent	Cum %
Dist. Learning Office	55.1	55.1
Producer	10.2	65.3
Technology conference	6.1	71.4
Another district	6.1	77.6
Your superintendent	20.4	98.0
Other	2.0	100.0

ITEM #10: Would Recommend Courses By Satellite

Label	Percent	Cum %
Yes	98.0	98.0
No	2.0	100.0

ITEM #11: Proportion Of Students Who Receive Chapter 1 In Building

Label	Percent	Cum %
0-9%	40.8	41.7
10-19%	8.2	50.0
20-29%	20.4	70.8
30-39%	8.2	79.2
40-49%	6.1	85.4
50-59%	6.1	91.7
70-79%	2.0	93.8
80-89%	2.0	95.8
90-100%	4.1	100.0

ITEM #12: Proportion Of Minority Students In Building

Label	Percent	Cum %
0-9%	6.1	6.3
10-19%	8.2	14.6
20-29%	12.2	27.1
30-39%	16.3	43.8
40-49%	12.2	56.3
50-59%	4.1	60.4
60-69%	6.1	66.7
70-79%	6.1	72.9
80-89%	6.1	79.2
90-100%	20.8	100.0

ITEM #13: Proportion Of Students Behind In Reading In Building

Label	Percent	Cum %
0-9%	20.4	20.8
10-19%	22.4	43.8
20-29%	26.5	70.8
30-39%	10.2	81.3
40-49%	2.0	83.3
50-59%	4.1	87.5
60-69%	2.0	89.6
80-89%	6.1	95.8
90-100%	4.1	100.0

ITEM #14: Proportion Of Students Behind In Math In Building

Label	Percent	Cum %
0-9%	20.4	20.8
10-19%	14.3	35.4
20-29%	32.7	68.8
30-39%	10.2	79.2
40-49%	4.1	83.3
50-59%	8.2	91.7
60-69%	6.1	97.9
80-89%	6.1	97.9
90-100%	2.1	100.0

ITEM #15: Proportion Of Students Likely To Finish High School In Building

Label	Percent	Cum %
0-9%	2.0	2.1
20-29%	2.0	4.3
30-39%	2.0	6.4
50-59%	4.1	10.6
60-69%	4.1	14.9
70-79%	16.3	31.9
80-89%	38.8	72.3
90-100%	26.5	100.0

ITEMS 16-26: Courses By Satellite In Your Building

Label	Percent
Basic English/Reading	14.3
German I	18.4
German II	2.0
Spanish I	36.7
Russian	4.1
Applied Economics	8.2
American Goverment	12.2
Physics	10.2
Chemistry	12.2
Calculus	6.1
Trigonometry	6.1

ITEM #27: Enrollment Restriction By Grade Level

Label	Percent	Cum %
Yes	65.3	65.3
No	34.7	100.0

ITEM #28: Enrollment Restriction By Ability Level

Label	Percent	Cum %
Yes	71.4	71.4
No	28.6	100.0

ITEM #29: Enrollment Restriction By Class Size

Label	Percent	Cum %
Yes	65.3	65.3
No	34.7	100.0

ITEM #30: Did You Modify School Calendar

Label	Percent	Cum %
Yes	14.3	14.3
No	85.7	100.0

ITEM #31: Did You Modify Class Schedule

Label	Percent	Cum %
Yes	26.5	26.5
No	73.5	100.0

ITEM #32: Quality Of Instruction By Satellite

Label	Percent	Cum %
Very satisfied	57.1	57.1
Satisfied	40.8	98.0
Dissatisfied	2.0	100.0

ITEM #33: Technical Or Production Quality

Label	Percent	Cum %
Very satisfied	55.1	55.1
Satisfied	44.9	100.0

ITEM #34: Cost Compared To Non-Satellite

Label	Percent	Cum %
Very satisfied	34.7	34.7
Satisfied	38.8	73.5
Neither	16.3	89.8
Dissatisfied	8.2	98.0
Very dissatisfied	2.0	100.0

ITEM #35: Level Of Difficulty

Label	Percent	Cum %
Very satisfied	36.7	36.7
Satisfied	46.9	83.7
Neither	14.3	98.0
Dissatisfied	2.0	100.0

ITEM #36: Content

Label	Percent	Cum %
Very satisfied	46.9	46.9
Satisfied	53.1	100.0

ITEM #37: Fit With Your Curriculum

Label	Percent	Cum %
Very satisfied	55.1	55.1
Satisfied	42.9	98.0
Neither	2.0	100.0

ITEM #38: Knowledge Gained

Label	Percent	Cum %
Very satisfied	49.0	49.0
Satisfied	40.8	89.8
Neither	4.1	93.9
Dissatisfied	6.1	100.0

ITEM #39: Access To Technical Support

Label	Percent	Cum %
Very satisfied	46.9	46.9
Satisfied	44.9	91.8
Neither	6.1	98.0
Dissatisfied	2.0	100.0

ITEM #40: Access To Content Support

Label	Percent	Cum %
Very satisfied	40.8	40.8
Satisfied	55.1	95.9
Neither	4.1	100.0

ITEM #41: Motivation Required Was A Problem

Label	Percent	Cum %
Serious problem	8.2	8.2
Problem not serious	40.8	49.0
Not a problem	51.0	100.0

ITEM #42: Instructor Response Speed Was A Problem

Label	Percent	Cum %
Serious Problem	4.1	4.1
Problem not serious	57.1	61.2
Not a problem	36.7	98.0
Not applicable	2.0	100.0

ITEM #43: Lack of Feedback Was A Problem

Label	Percent	Cum %
Serious problem	6.1	6.1
Problem not serious	53.1	59.2
Not a problem	40.8	100.0

ITEM #44: Lack Of Interaction With TV Instructor

Label	Percent	Cum %
Serious problem	2.0	2.0
Problem no serious	42.9	44.9
Not a problem	51.0	95.9
Not applicable	4.1	100.0

ITEM #45: Inadequate Technical Training Was A Problem

Label	Percent	Cum %
Serious problem	4.1	4.1
Problem not serious	30.6	34.7
Not a problem	65.3	100.0

ITEM #46: Inadequate Content Training Was A Problem

Label	Percent	Cum %
Serious Prnblem	4.1	4.1
Problem not serious	26.5	30.6
Not a problem	65.3	95.9
Not applicable	4.1	100.0

ITEM #47: Roles Uncomfortable For Teacher

Label	Percent	Cum %
Serious problem	2.0	2.0
Problem not serious	24.5	26.5
Not a problem	61.2	87.8
Not applicable	12.2	100.0

ITEM #48: Unforeseen Costs Of Course Were A Problem

Label	Percent	Cum %
Serious problem	10.2	10.2
Problem not serious	26.5	36.7
Not a problem	61.2	98.0
Not applicable	2.0	100.0

ITEM #49: Equipment Malfunctions Were A Problem

Label	Percent	Cum %
Serious problem	6.1	6.1
Problem not serious	28.6	34.7
Not a problem	65.3	100.0

ITEM #50: Scheduling Was A Problem

Label	Percent	Cum %
Serious problem	2.0	2.0
Problem not serious	36.7	38.8
Not a problem	61.2	100.0

ITEM #51: Inflexibility of Courses Was A Problem

Label	Percent	Cum %
Serious problem	2.0	2.0
Problem not serious	34.7	36.7
Not a problem	57.1	93.9
Not applicable	6.1	100.0

ITEM #52: Disappointment With Course Quality

Label	Percent	Cum %
Problem not serious	12.2	12.2
Not a problem	85.7	98.0
Not applicable	2.0	100.0

Table 13
Superintendent

ITEM #1: District Location

Label	Percent	Cum %
Urban	2.2	2.2
Suburban	2.2	4.4
Rural	95.6	100.0

ITEM #2: District Enrollment

Label	Percent	Cum %
300-499	4.4	4.4
500-750	4.4	8.9
751-999	6.7	15.6
1000-1999	28.9	44.4
2000-4999	51.1	95.6
5000-10,000	4.4	100.0

ITEM #3: Years As Superintendent

Label	Percent	Cum %
1 or less	33.3	40.0
2-3	8.9	48.9
4-6	17.8	66.7
7-9	17.8	84.4
10-12	2.2	86.7
13-15	13.3	100.0

ITEM #6: District Achievement Compared To National Average

Label	Percent	Cum %
Much above	4.4	4.4
Slightly above	6.7	11.1
At national average	35.6	46.7
Slightly below	40.0	86.7
Much below	13.3	100.0

ITEM #7: Where You First Learned Of Instruction By Satellite

Label	Percent	Cum %
Ole Mississippi	68.9	68.9
Program producer	4.4	73.3
Employee of school	6.7	80.0
Another district	4.4	84.4
Other	15.6	100.0

ITEM #8: Attended Distance Learning Conference

Label	Percent	Cum %
Yes	40.0	40.0
No	60.0	100.0

ITEM #9: Would Recommend Courses By Satellite

Label	Percent	Cum %
Yes	93.3	93.3
Uncertain	6.7	100.0

ITEM #10: School Board Attitude Toward Satellite Courses

Label	Percent	Cum %
Very favorable	48.9	48.9
Favorable	46.7	95.6
Very unfavorable	4.4	100.0

ITEM #11: Teacher Attitude Toward Satellite Courses

Label	Percent	Cum %
Very favorable	37.8	37.8
Favorable	53.3	91.1
Very unfavorable	8.9	100.0

ITEM #12: Proportion Of Students Who Receive Chapter I Services In District

Label	Percent	Cum %
0-9%	4.7	4.7
10-19%	13.3	18.6
20-29%	24.4	44.2
30-39%	15.6	60.5
40-49%	15.6	76.7
50-59%	6.7	83.7
60-69%	6.7	90.7
70-79%	8.9	100.0

ITEM #14: Proportion Of Minority Students In District

Label	Percent	Cum %
0-9%	8.9	8.9
10-19%	2.2	11.1
20-29%	11.1	22.2
30-39%	22.2	44.4
40-49%	4.4	48.9
50-59%	11.1	60.0
60-69%	13.3	73.3
70-79%	8.9	82.2
80-89%	2.2	84.4
90-100%	15.6	100.0

ITEM #15: Proportion Of Students Behind In Reading In District

Label	Percent	Cum %
0-9%	6.7	6.8
10-19%	22.2	29.5
20-29%	15.6	45.5
30-39%	17.8	63.6
40-49%	15.6	79.5
50-59%	8.9	88.6
60-69%	4.4	93.2
80-89%	2.2	95.5
90-100%	4.4	100.0

ITEM #16: Proportion Of Students Behind In Math In District

Label	Percent	Cum %
0-9%	6.7	7.0
10-19%	17.8	25.6
20-29%	17.8	44.2
30-39%	22.2	67.4
40-49%	8.9	76.7
50-59%	8.9	86.0
60-69%	4.4	90.7
70-79%	2.2	93.0
80-89%	4.4	97.7
90-100%	2.2	100.0

ITEM #17: Proportion Of Students Likely To Finish High School In District

Label	Percent	Cum %
0-9%	2.2	2.3
10-19%	2.2	4.5
50-59%	8.9	13.6
60-69%	17.8	31.8
70-79%	22.2	54.5
80-89%	37.8	93.2
90-100%	6.7	100.0

ITEM #18-28: Courses Offered By Satellite In Your District

Label	Percent
Basic English/Reading	22.2
German I	20.0
German II	0
Spanish	42.2
Russian	6.7
Economics	6.7
American Government	8.9
Physics	11.1
Calculus	6.7
Trigonometry	13.3

ITEM #29: Quality Of Instruction By Satellite

Label	Percent	Cum %
Very satisfied	35.6	35.6
Satisfied	57.8	93.3
Neither	6.7	100.0

ITEM #30: Technical Or Production Quality

Label	Percent	Cum %
Very satisfied	35.6	35.6
Satisfied	64.4	100.0

ITEM #31: Cost Compared To Non-Satellite

Label	Percent	Cum %
Very satisfied	13.3	13.6
Satisfied	57.8	72.7
Neither	13.3	86.4
Dissatisfied	13.3	100.0

ITEM #32: Level Of Difficulty

Label	Percent	Cum %
Very satisfied	13.3	13.3
Satisfied	68.9	82.2
Neither	13.3	95.6
Dissatisfied	2.2	97.8
Not applicable	2.2	100.0

ITEM #33: Content

Label	Percent	Cum %
Very satisfied	13.3	13.3
Satisfied	80.0	93.3
Neither	4.4	97.8

ITEM #34: Fit With Your Curriculum

Label	Percent	Cum %
Very satisfied	24.4	24.4
Satisfied	73.3	97.8
Neither	2.2	100.0

ITEM #35: Knowledge Gained

Label	Percent	Cum %
Very satisfied	22.2	22.2
Satisfied	62.2	84.4
Neither	13.3	97.8
Dissatisfied	2.2	100.0

ITEM #36: Access To Technical Support

Label	Percent	Cum %
Very satisfied	26.7	26.7
Satisfied	57.8	84.4
Neither	13.3	97.8
Dissatisfied	2.2	100.0

ITEM #37: Access To Content Support

Label	Percent	Cum %
Very satisfied	17.8	17.8
Satisfied	57.8	75.6
Neither	22.2	97.8
Not applicable	2.2	100.0

ITEM #38: Student Motivation Will Limit Satellite

Label	Percent	Cum %
Very likely	13.3	14.0
Somewhat likely	55.6	72.1
Not likely	26.7	100.0

ITEM #39: Course Difficulty Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	4.5
Somewhat likely	37.8	43.2
Not likely	51.1	95.5
Not applicable	4.4	100.0

ITEM #40: Expense Will Limit Satellite

Label	Percent	Cum %
Very likely	35.6	35.6
Somewhat likely	37.8	73.3
Not likely	22.2	95.6
Not applicable	4.4	100.0

ITEM #41: State Department Regulations Will Limit Satellite

Label	Percent	Cum %
Very likely	6.7	6.7
Somewhat likely	37.8	44.4
Not likely	48.9	93.3
Not applicable	6.7	100.0

ITEM #42: Equipment Maintenance Costs Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	4.4
Somewhat likely	24.4	28.9
Not likely	68.9	97.8
Not applicable	2.2	100.0

ITEM #43: Teachers Dissatisfaction Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	4.4
Somewhat likely	8.9	13.3
Not likely	82.2	95.6
Not applicable	4.4	100.0

ITEM #44: Students Dissatisfaction Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	4.4
Somewhat likely	11.1	15.6
Not likely	80.0	95.6
Not applicable	4.4	100.0

ITEM #45: Consolidation Will Eliminate Need

Label	Percent	Cum %
Somewhat likely	11.1	11.6
Not likely	57.8	72.1
Not applicable	26.7	100.0

ITEM #46: Local Teachers Begin Teaching Course Instead

Label	Percent	Cum %
Very likely	4.4	4.5
Somewhat likely	20.0	25.0
Not likely	62.2	88.6
Not applicable	11.1	100.0

ITEM #47: Scheduling Problems Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	4.5
Somewhat likely	26.7	31.8
Not likely	60.0	93.2
Not applicable	6.7	100.0

ITEM #48: Inflexibility Of Courses Will Limit Satellite

Label	Percent	Cum %
Very likely	2.2	2.3
Somewhat likely	31.1	34.1
Not likely	53.3	88.6
Not applicable	1.1	100.0

ITEM #49: Disappointment With Quality Will Limit Satellite

Label	Percent	Cum %
Very likely	4.4	2.3
Somewhat likely	8.9	6.8
Not likely	82.2	86.4
Not applicable	4.4	100.0

ITEM #50: Realistic Preview Of College Work

Label	Percent	Cum %
Strongly agree	22.2	22.2
Agree	42.2	64.4
Neither	26.7	91.1
Disagree	4.4	95.6
Strongly agree	2.2	97.8
Not applicable	2.2	100.0

ITEM #51: Interaction With Other Schools

Label	Percent	Cum %
Strongly agree	22.2	22.2
Agree	48.9	71.1
Neither	26.7	97.8
Disagree	2.2	100.0

ITEM #52: Opportunity To Take More Challenging Courses

Label	Percent	Cum %
Strongly agree	53.3	53.3
Agree	40.0	93.3
Neither	6.7	100.0

ITEM #53: Fortunate To Take These Courses

Label	Percent	Cum %
Strongly agree	42.2	42.2
Agree	33.3	75.6
Neither	17.8	93.3
Disagree	4.4	97.8
Strongly disagree	2.2	100.0

ITEM #54: Teachers Get New Ideas

Label	Percent	Cum %
Strongly agree	28.9	28.9
Agree	48.9	77.8
Neither	17.8	95.6
Disagree	2.2	97.8
Not applicable	2.2	100.0

ITEM #55: Opportunity To Learn The Latest Technologies

Label	Percent	Cum %
Strongly agree	42.2	42.2
Agree	55.6	97.8
Neither	2.2	100.0

ITEM #56: Fortunate To Have Such Fine Instructors

Label	Percent	Cum %
Strongly agree	33.3	33.3
Agree	42.2	75.6
Neither	17.8	93.3
Disagree	4.4	97.8
Strongly disagree	2.2	100.0

Table 14
Comparison of Teaching Partners, Principals, Superintendents
Percent Agreement on Selected Variables

	Teaching Partners (Class Level)	Principals (School Level)	Superintendents (District Level)
Attended Conference	80	51	40
Would recommend satellite	93	98	93
	In That Class	**In That Building**	**In That District**
Proportion of Each Group Who Said Over 10% of "Their" Students Are In Each Category			
Students Receiving Chapter 1	24	58	95
Minority Students	67	94	91
Behind 1 Year in Reading	28	79	93
Behind 1 Year in Math	28	79	93
Proportion of Each Group Who Said Over 50% of "Their" Students Are In Each Category			
Students Receiving Chapter 1	11	8	16
Minority Students	37	40	40
Behind 1 Year In Reading	15	12	11
Behind 1 Year In Math	13	8	14
Percent Satisfied			
Overall Course Quality	87	98	93
Technical, Production Quality	96	100	100
Level of Difficulty	80	84	82
Content	91	100	93
Knowledge Gained	75	90	84
Access to Technical Support	91	92	84
Access to Content Support	84	96	76

Table 15

Comparison of Students, Teaching Partners, Principals and Superintendents Percent Agreement on Selected Variables

	Students	Teaching Partners	Principals	Superintendents
Opportunity to				
Take More Challenging Courses	69	96		93
Learn the Latest Technology	65	96		98
Promote Interaction Among Schools	57	69		71
Preview of College Work	59	80		64
Fortunate to				
Take This Course	62			76
Have Such Fine Instructors	44	80		76
Teachers Get New Ideas	55	76		78
Too Much Expected				
Self-Motivation	23	16	8	14
Study Skill	23	15		
Memorization	28	15		

Figure 1

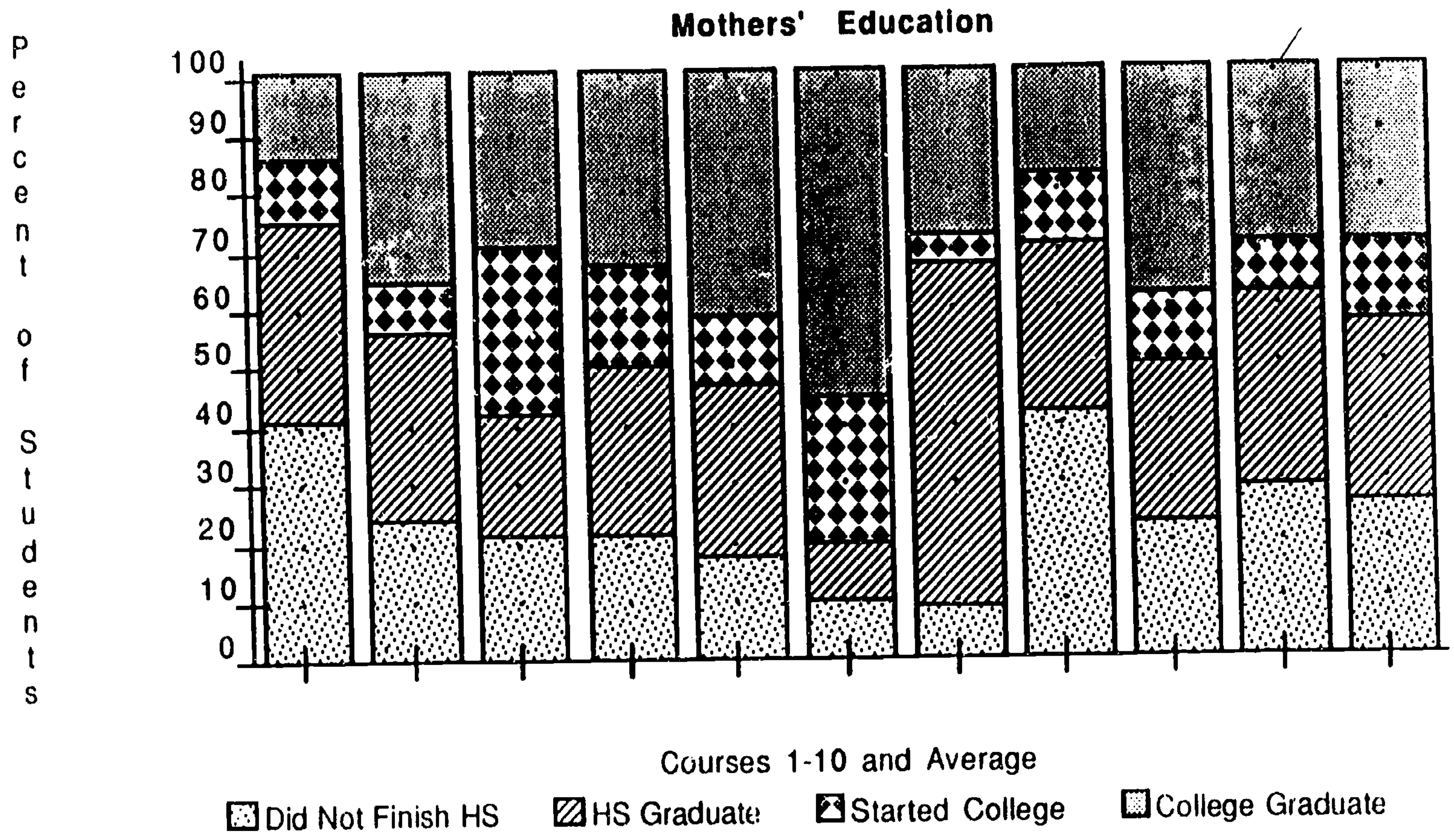

Mothers' Education
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Did Not Finish HS
HS Graduate
Started College
College Graduate

Figure 2

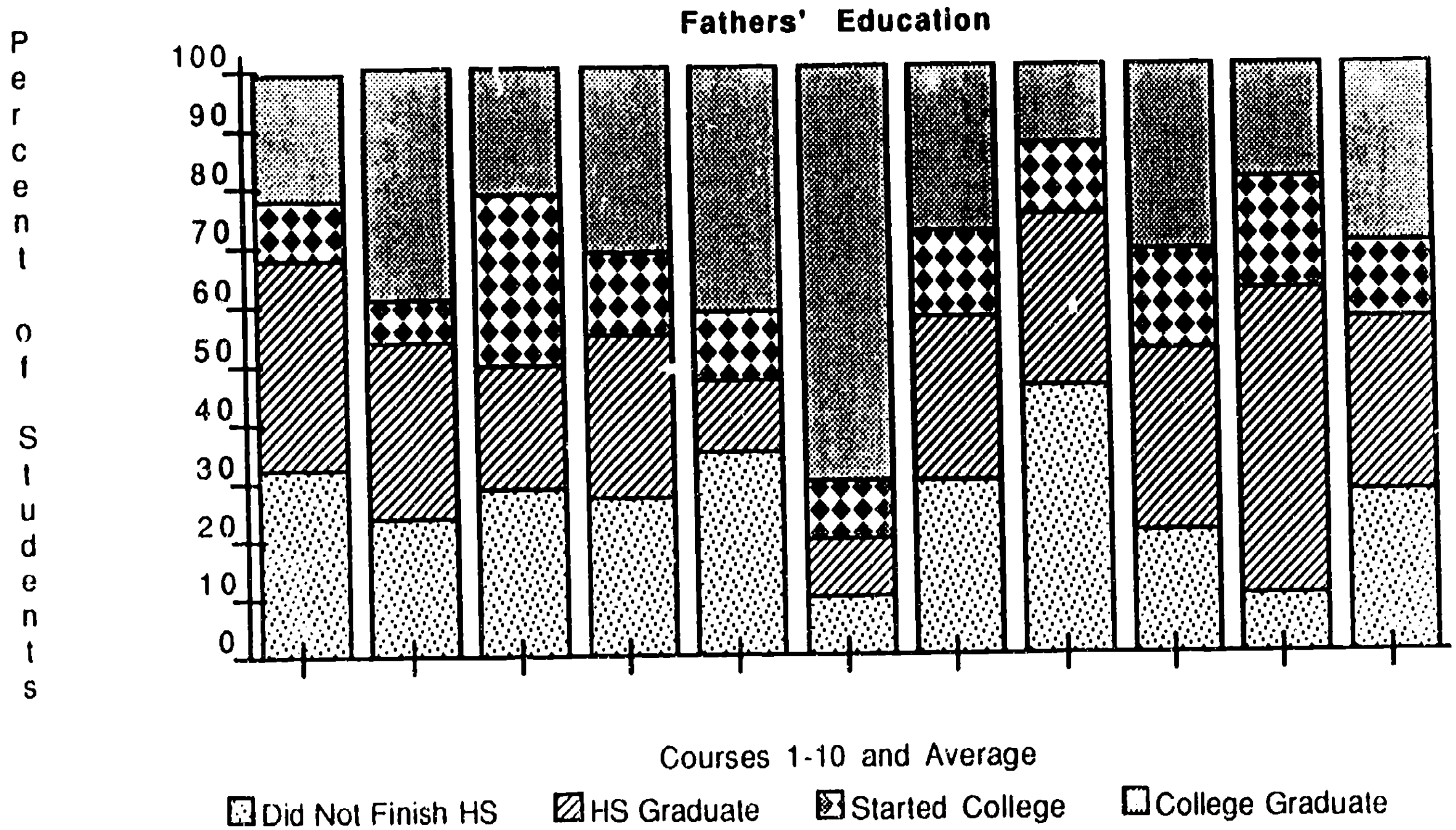

Fathers' Education
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Did Not Finish HS
HS Graduate
Started College
College Graduate

Figure 3

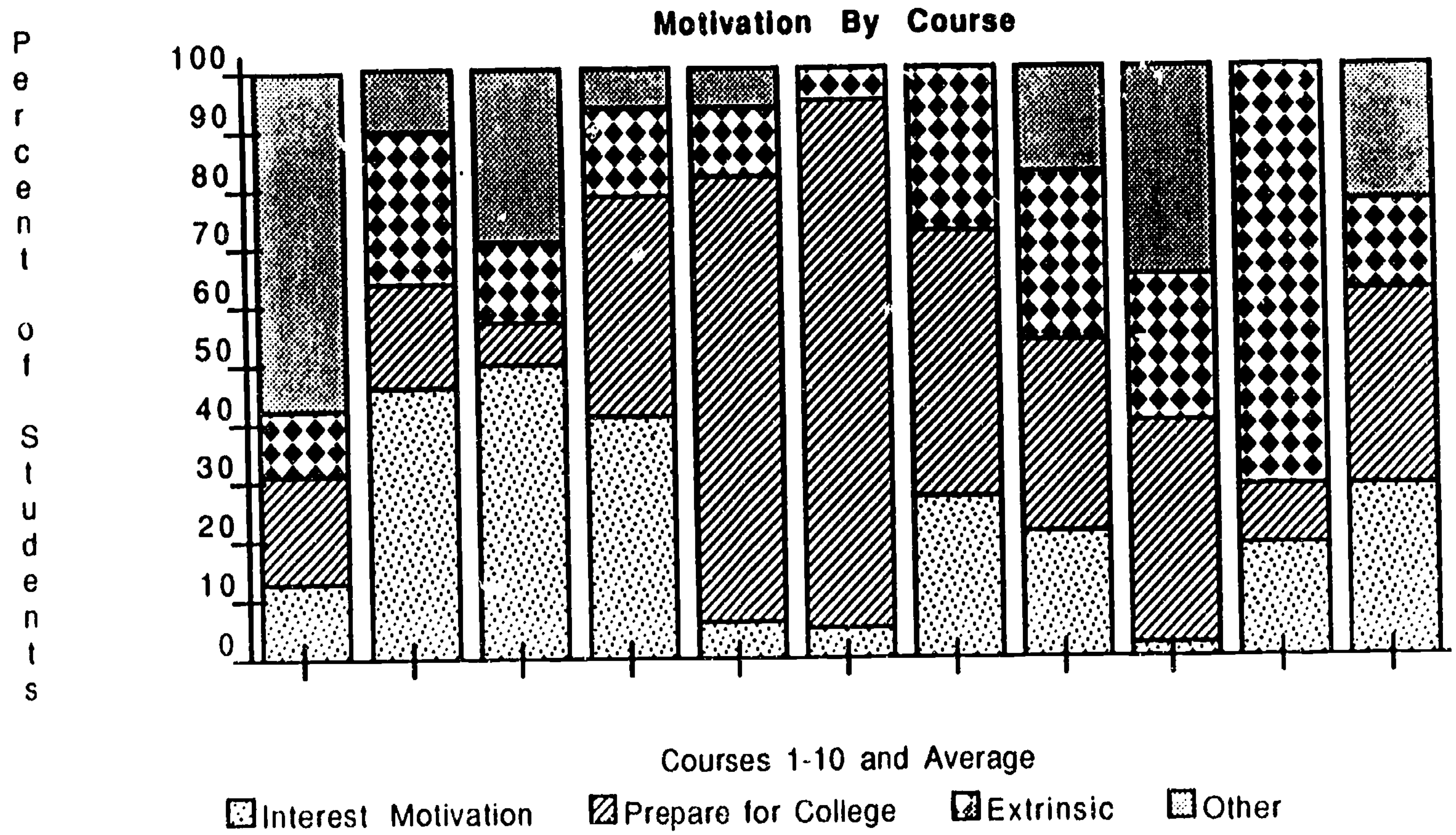

Motivation By Course
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Interest Motivation
Prepare for College
Extrinsic
Other

Figure 4

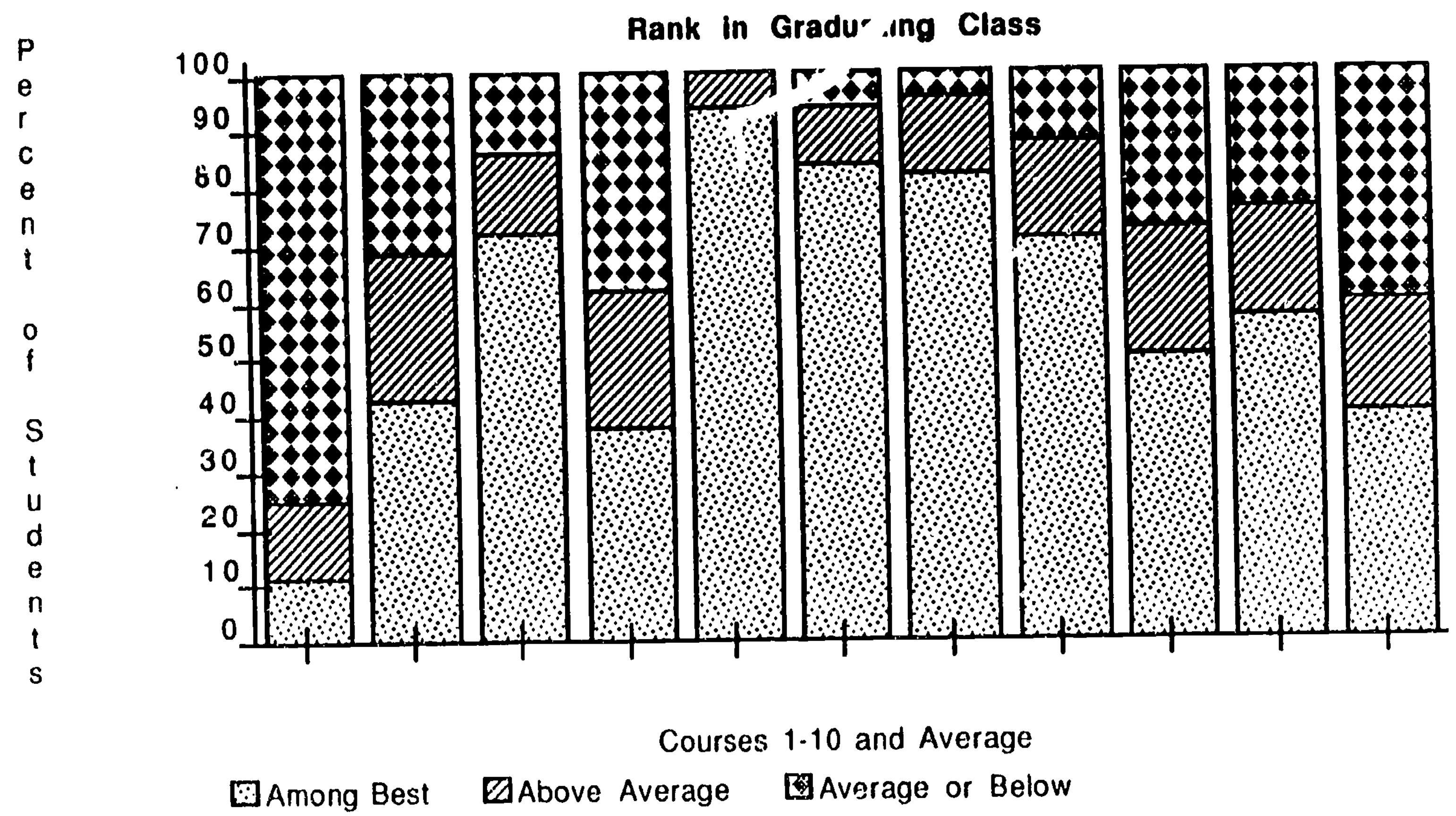

Rank in Gradu'.ing Class
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Among Best
Above Average
Average or Below

Figure 5

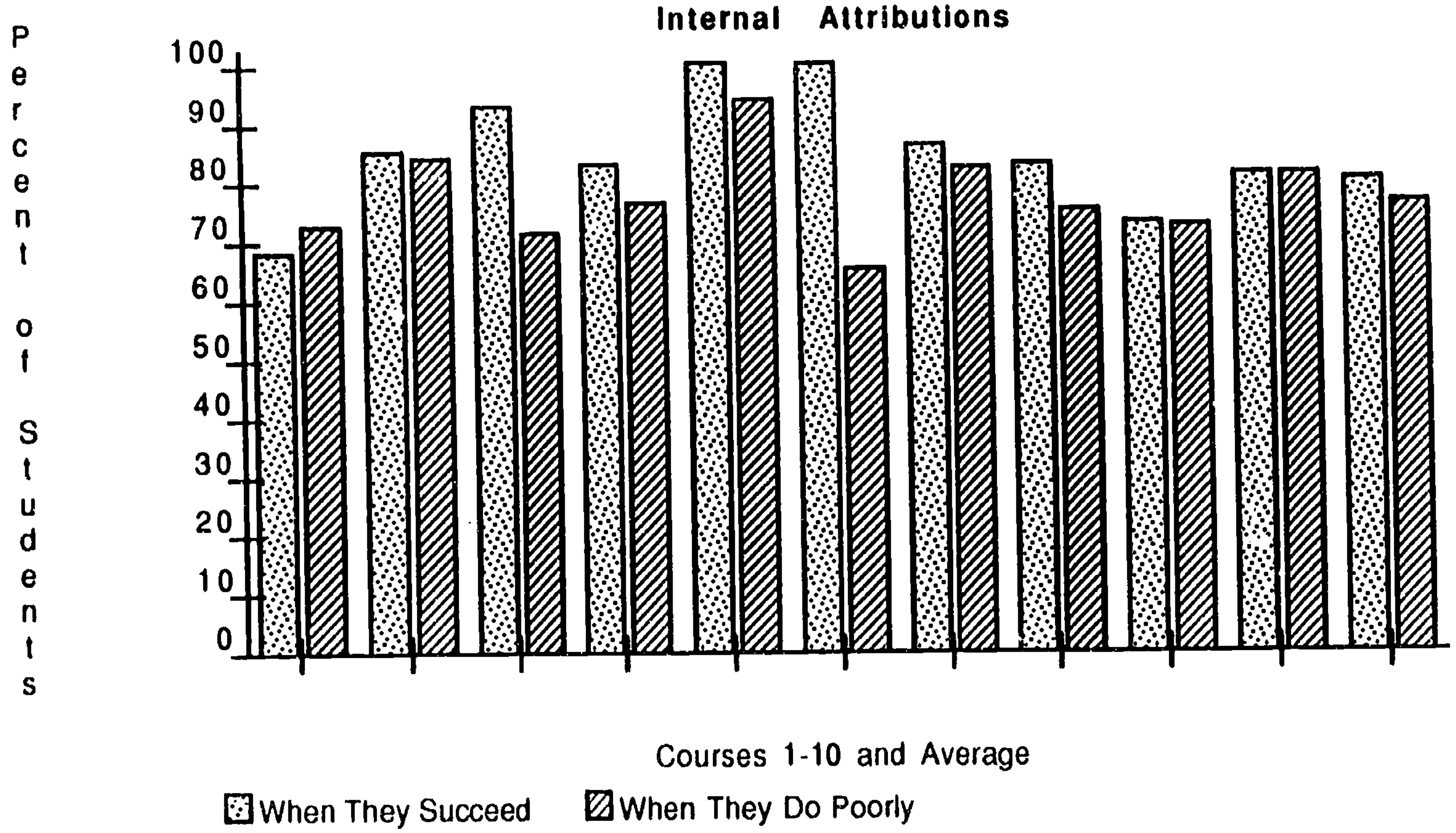

Internal Attributions
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
When They Succeed
When They Do Poorly

Figure 6

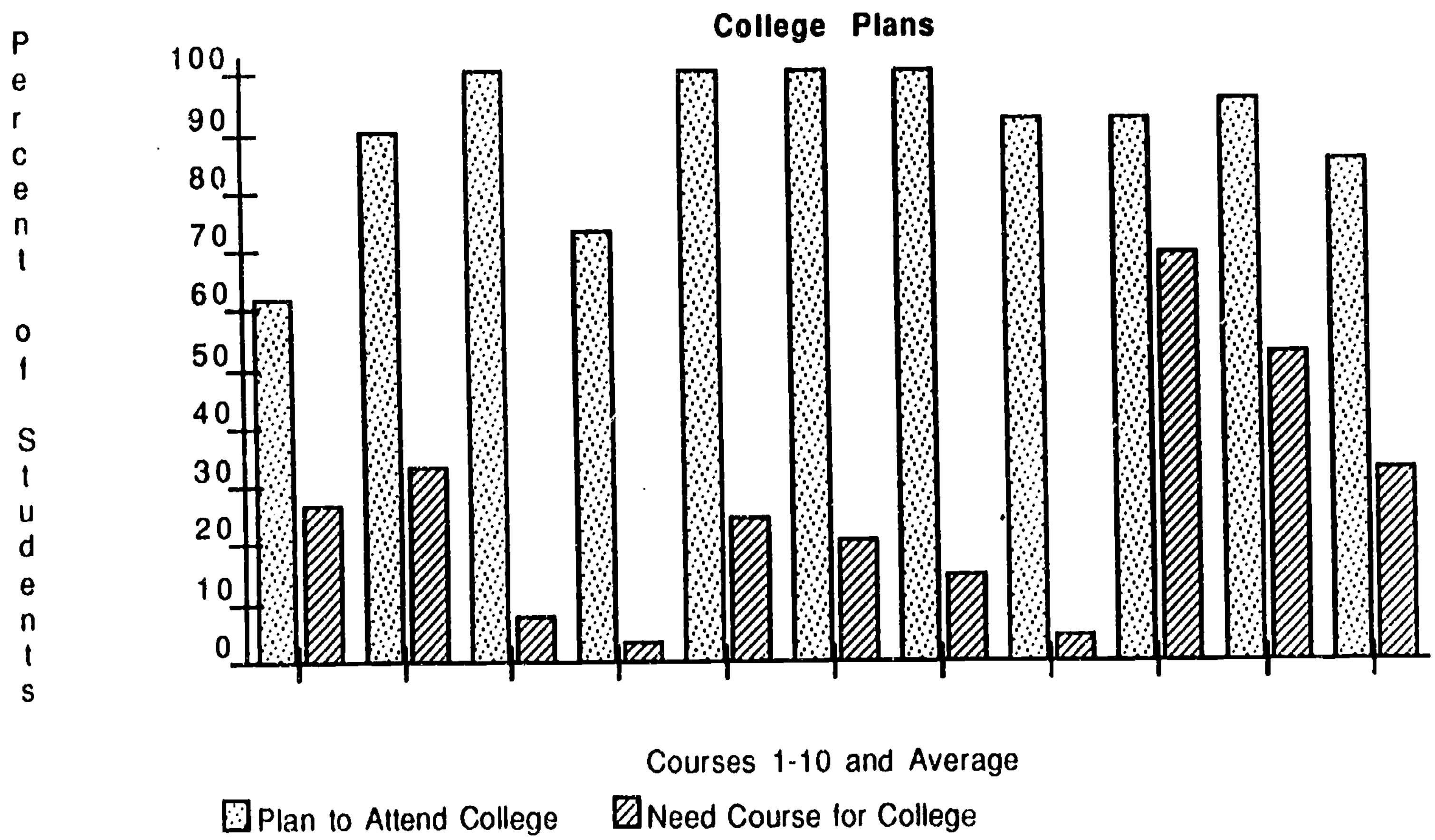

College Plans
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Plan to Attend College
Need Course for College

Figure 7

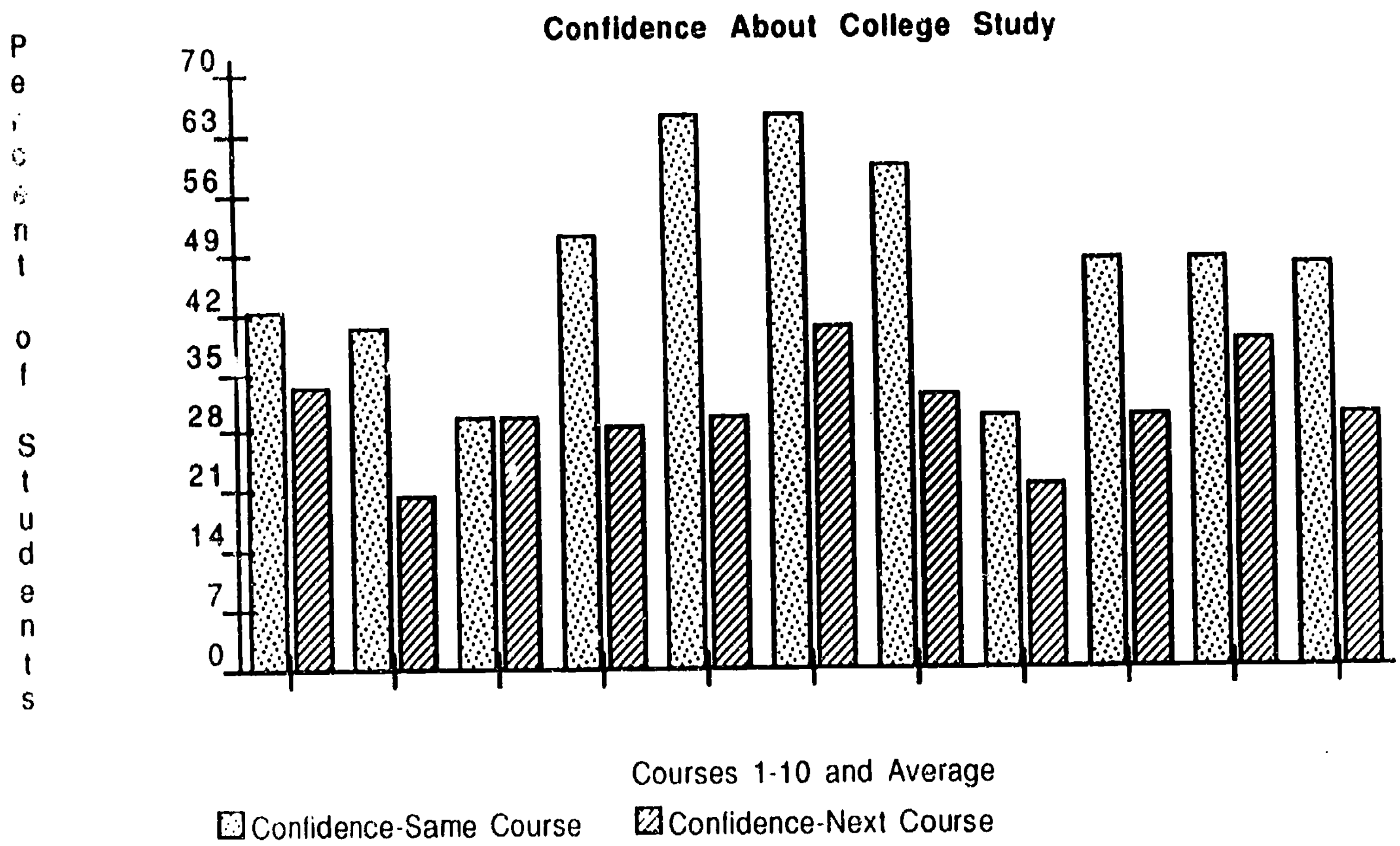

Confidence About College Study
Percent of Students
70
63
56
49
42
35
28
21
14
7
0
Courses 1-10 and Average
Confidence-Same Course
Confidence-Next Course

Figure 8

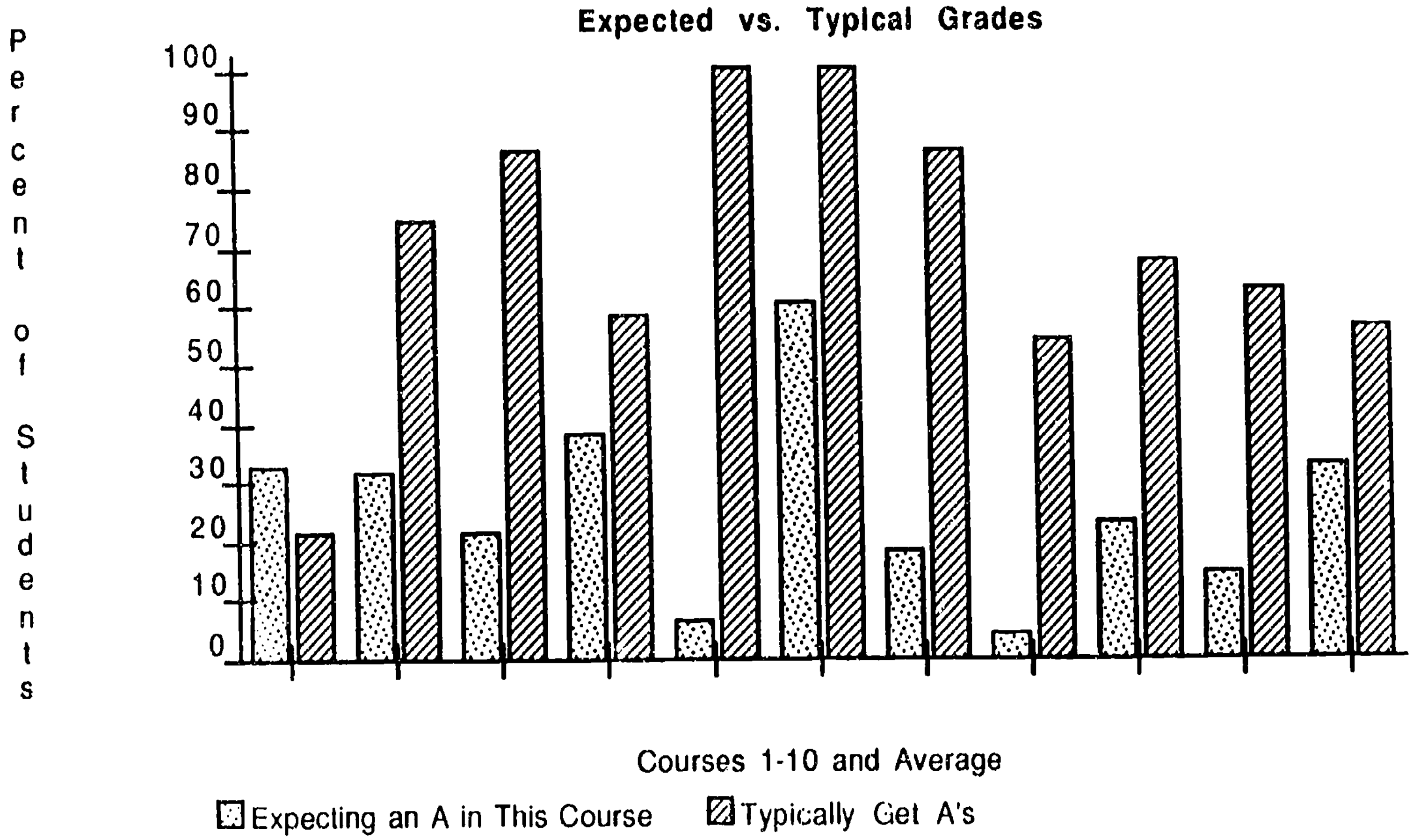

Expected vs. Typical Grades
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Expecting an A in This Course
Typically Get A's

Figure 9

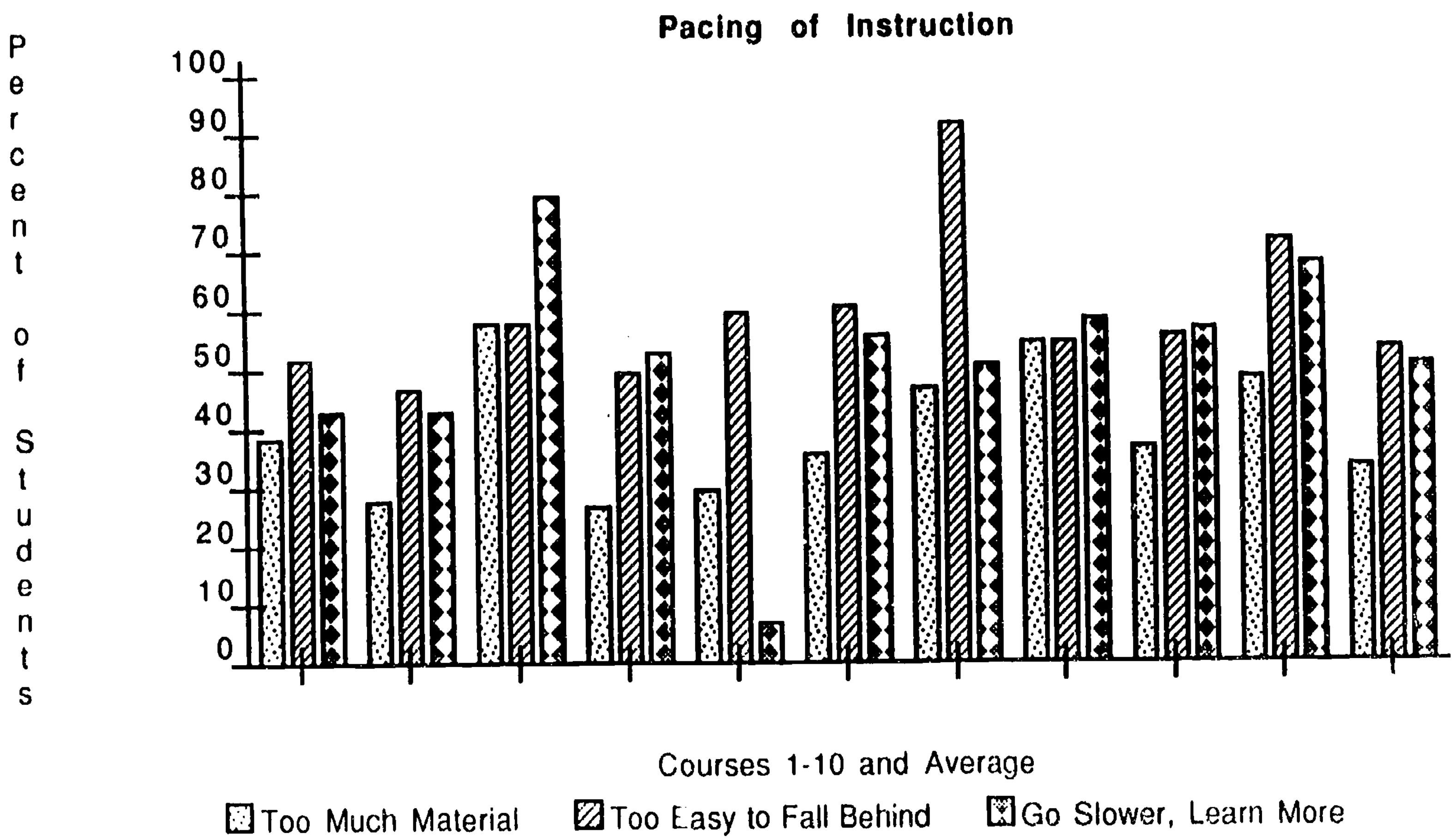

Pacing of Instruction
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Too Much Material
Too Easy to Fall Behind
Go Slower, Learn More

Figure 10

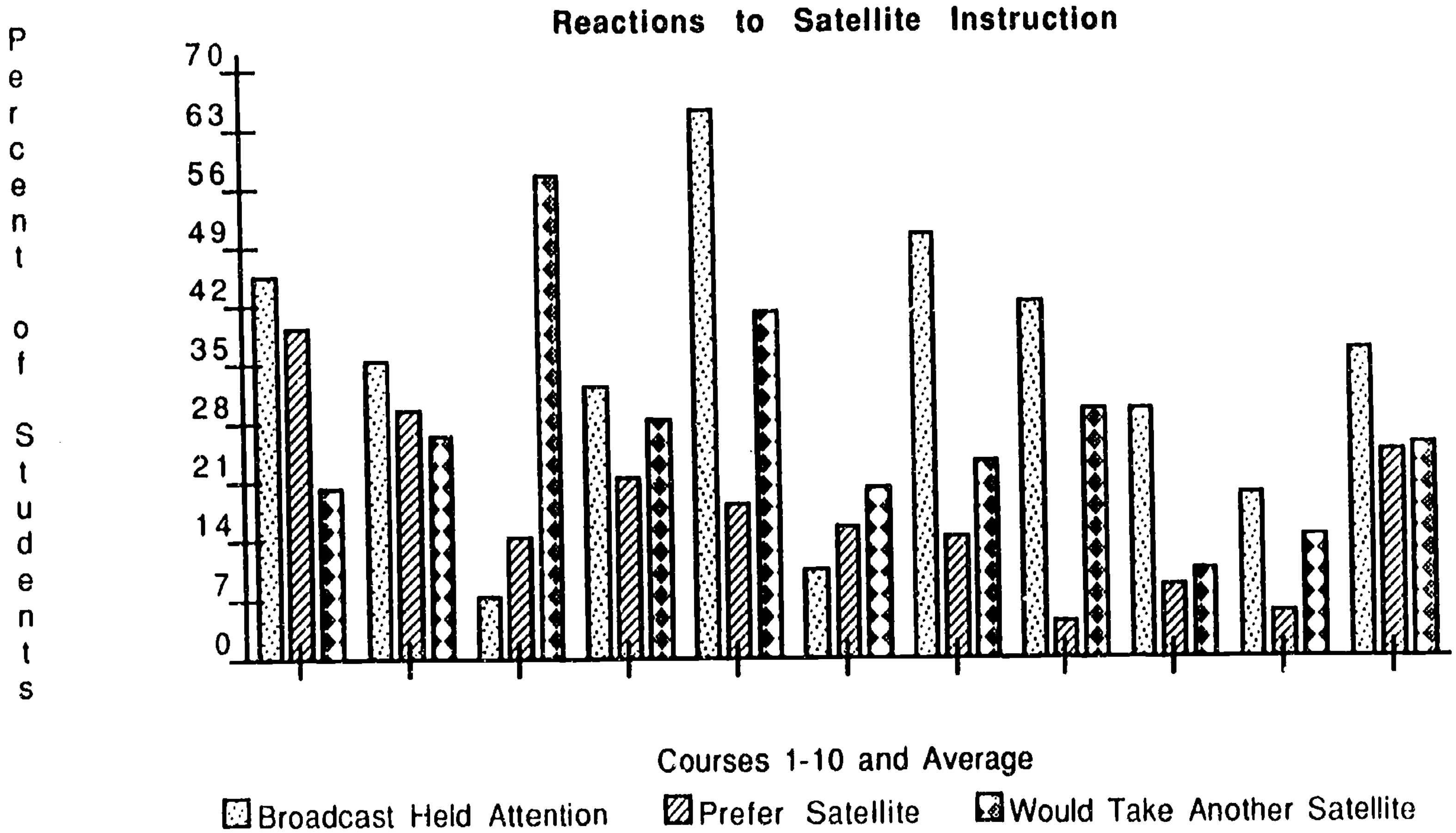
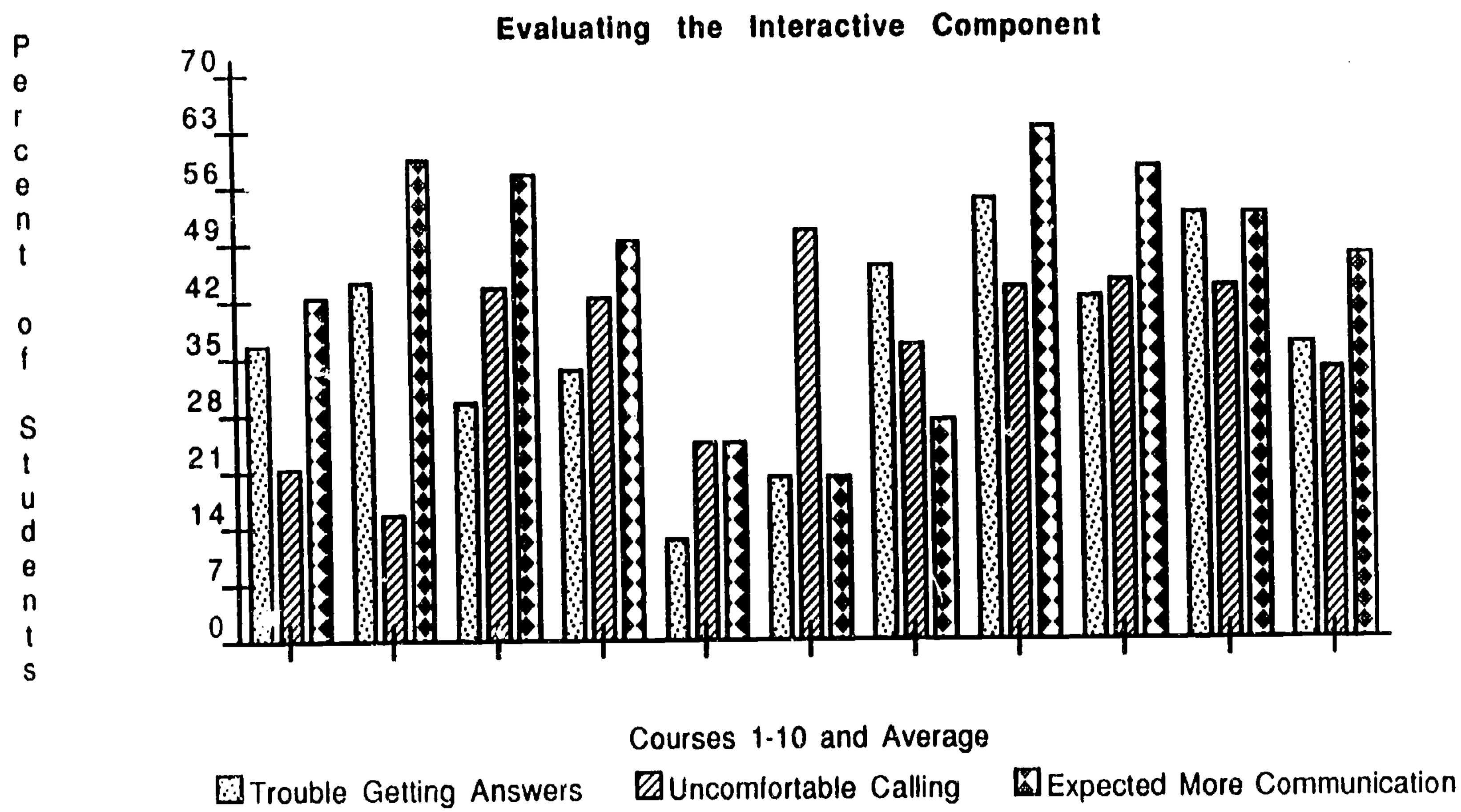

Reactions to Satellite Instruction
Percent of Students
70
63
56
49
42
35
28
21
14
7
0
Courses 1-10 and Average
Broadcast Held Attention
Prefer Satellite
Would Take Another Satellite

Figure 11



Evaluating the Interactive Component
Percent of Students
70
63
56
49
42
35
28
21
14
7
0
Courses 1-10 and Average
Trouble Getting Answers
Uncomfortable Calling
Expected More Communication

Figure 12

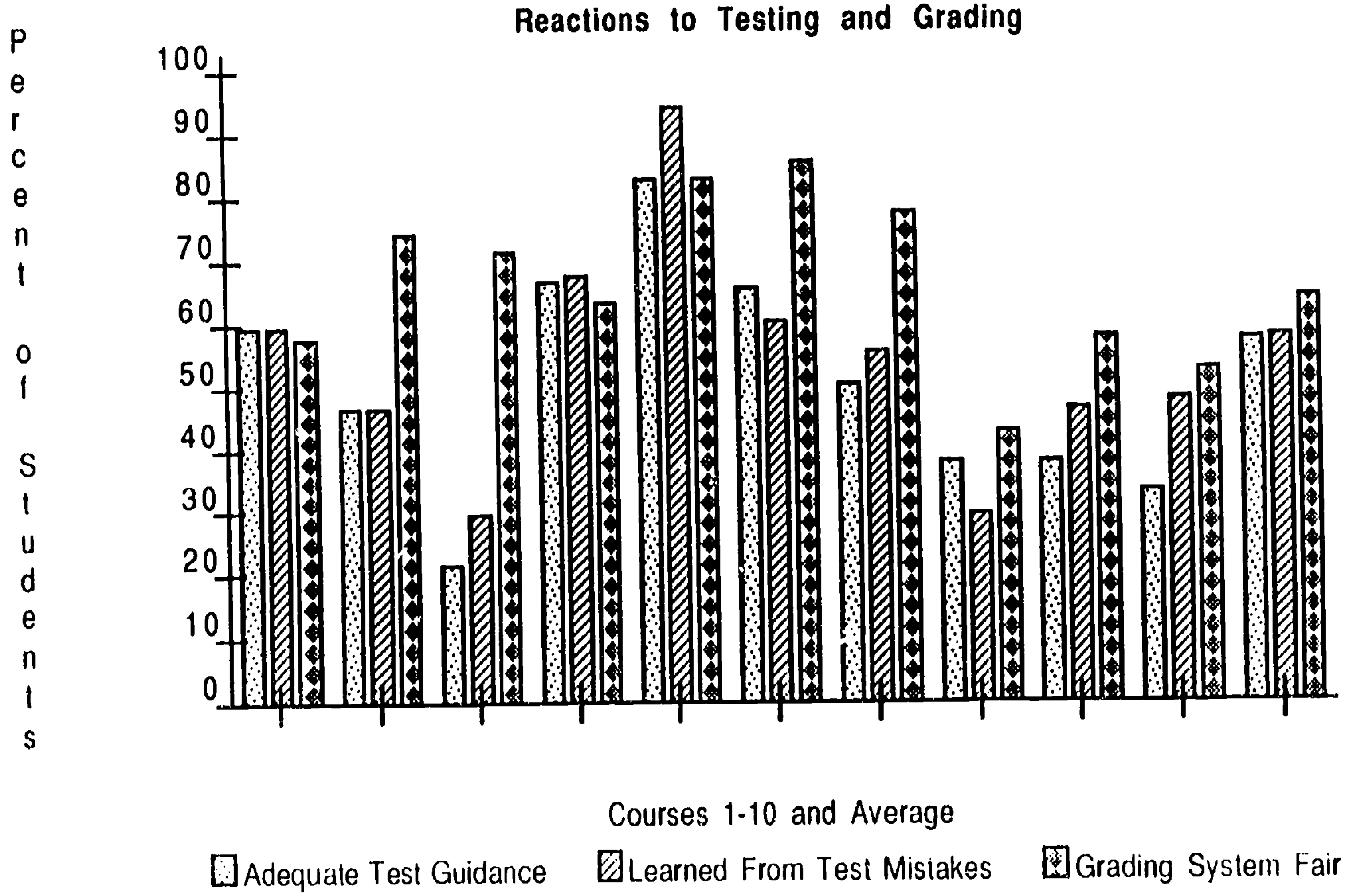

Reactions to Testing and Grading
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Adequate Test Guidance
Learned From Test Mistakes
Grading System Fair

Figure 13

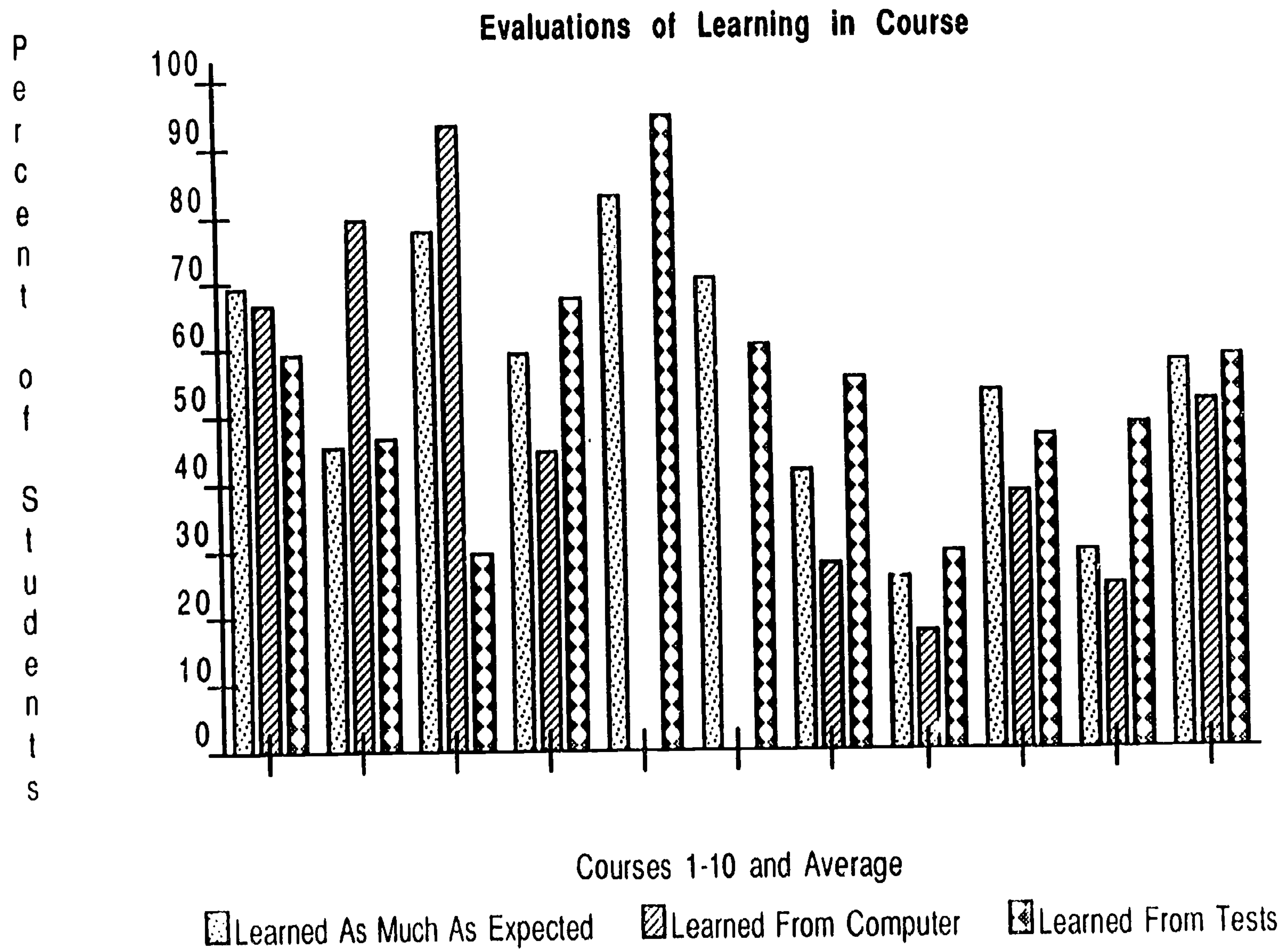

Evaluations of Learning in Course
Percent of Students
100
90
80
70
60
50
40
30
20
10
0
Courses 1-10 and Average
Learned As Much As Expected
Learned From Computer
Learned From Tests

Figure 14

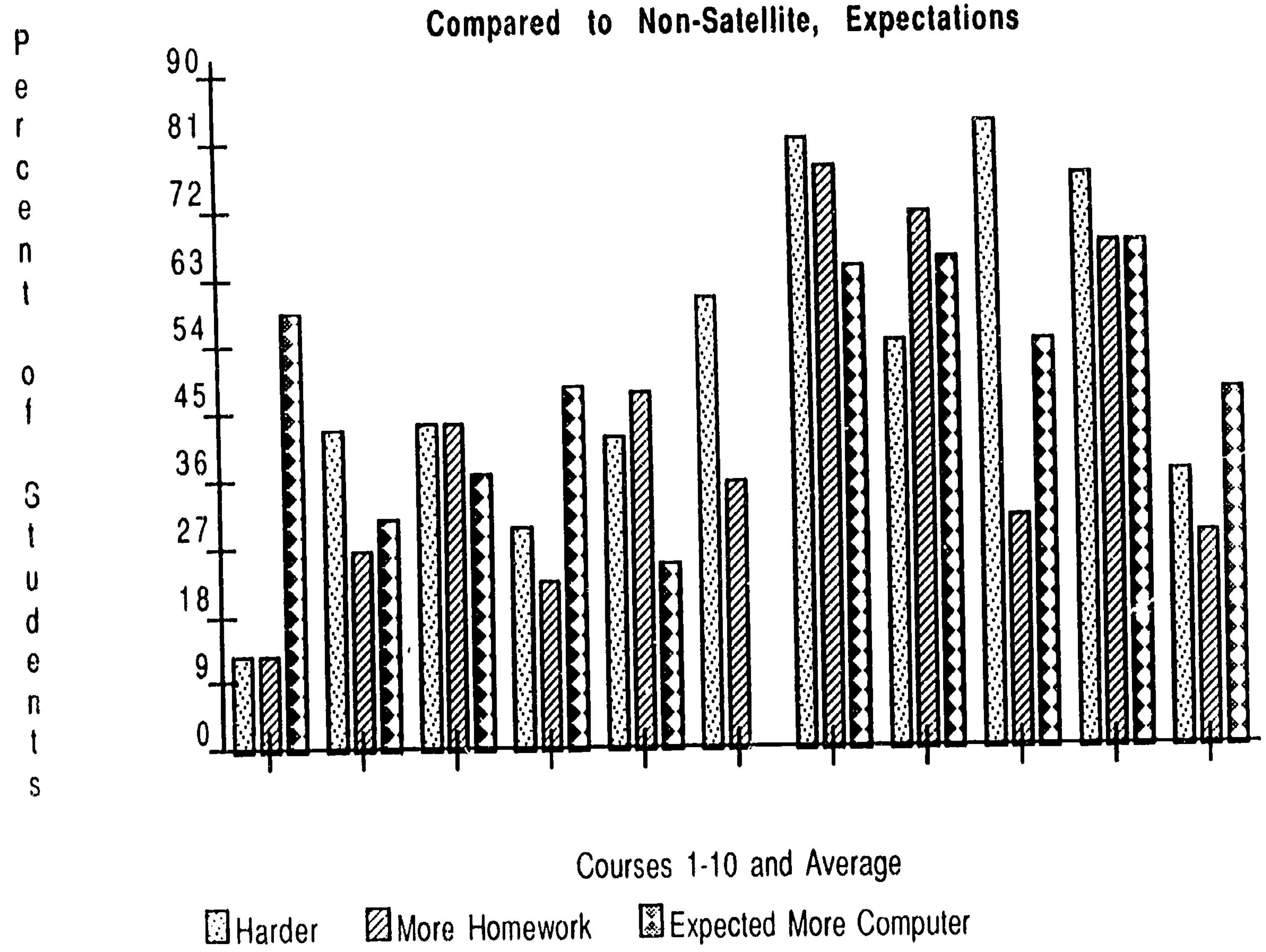

Compared to Non-Satellite, Expectations
Percent of Students
90
81
72
63
54
45
36
27
18
9
0
Courses 1-10 and Average
Harder
More Homework
Expected More Computer

Figure 15

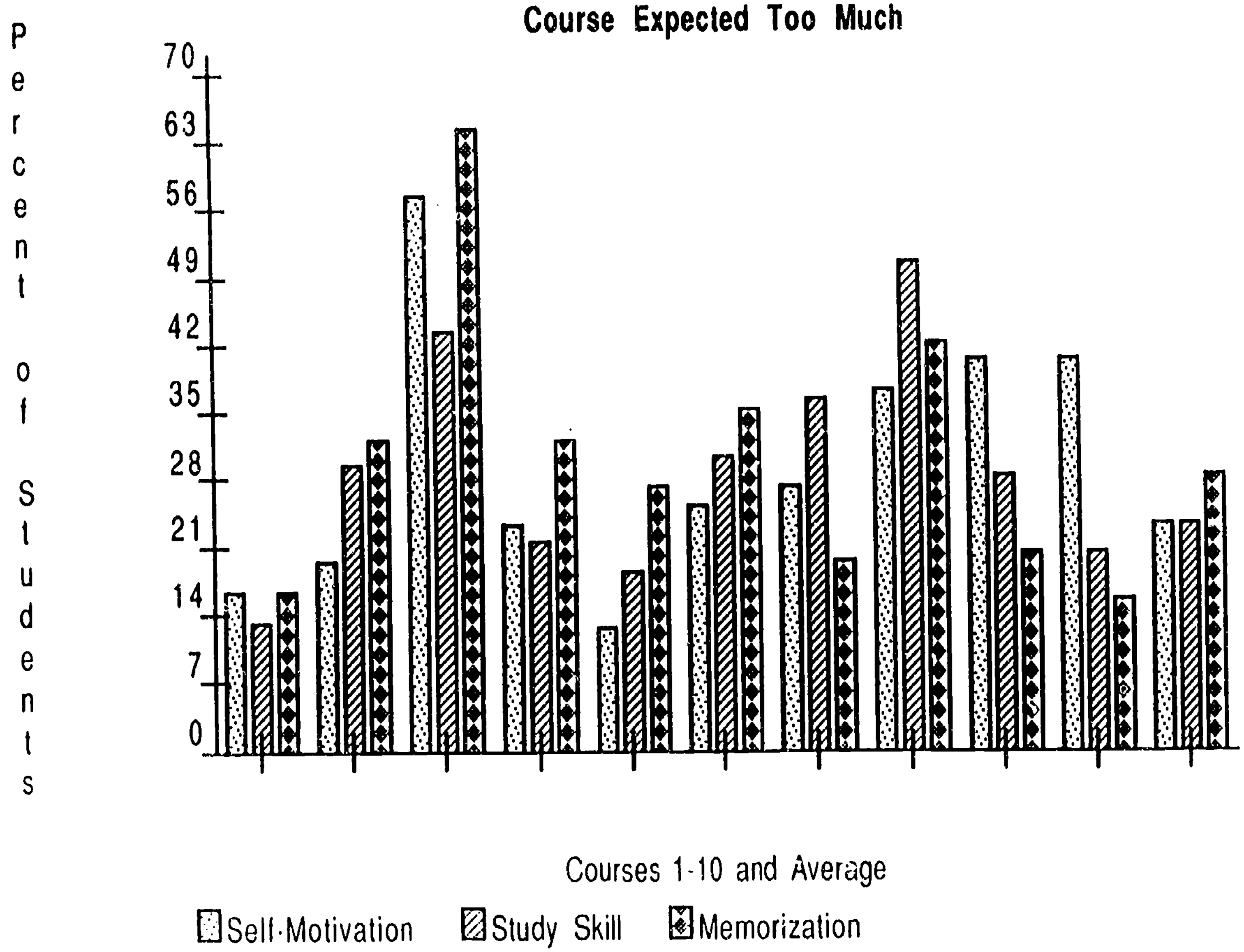

Course Expected Too Much
Percent of Students
70
63
56
49
42
35
28
21
14
7
0
Courses 1-10 and Average
Self-Motivation
Study Skill
Memorization

Figure 16

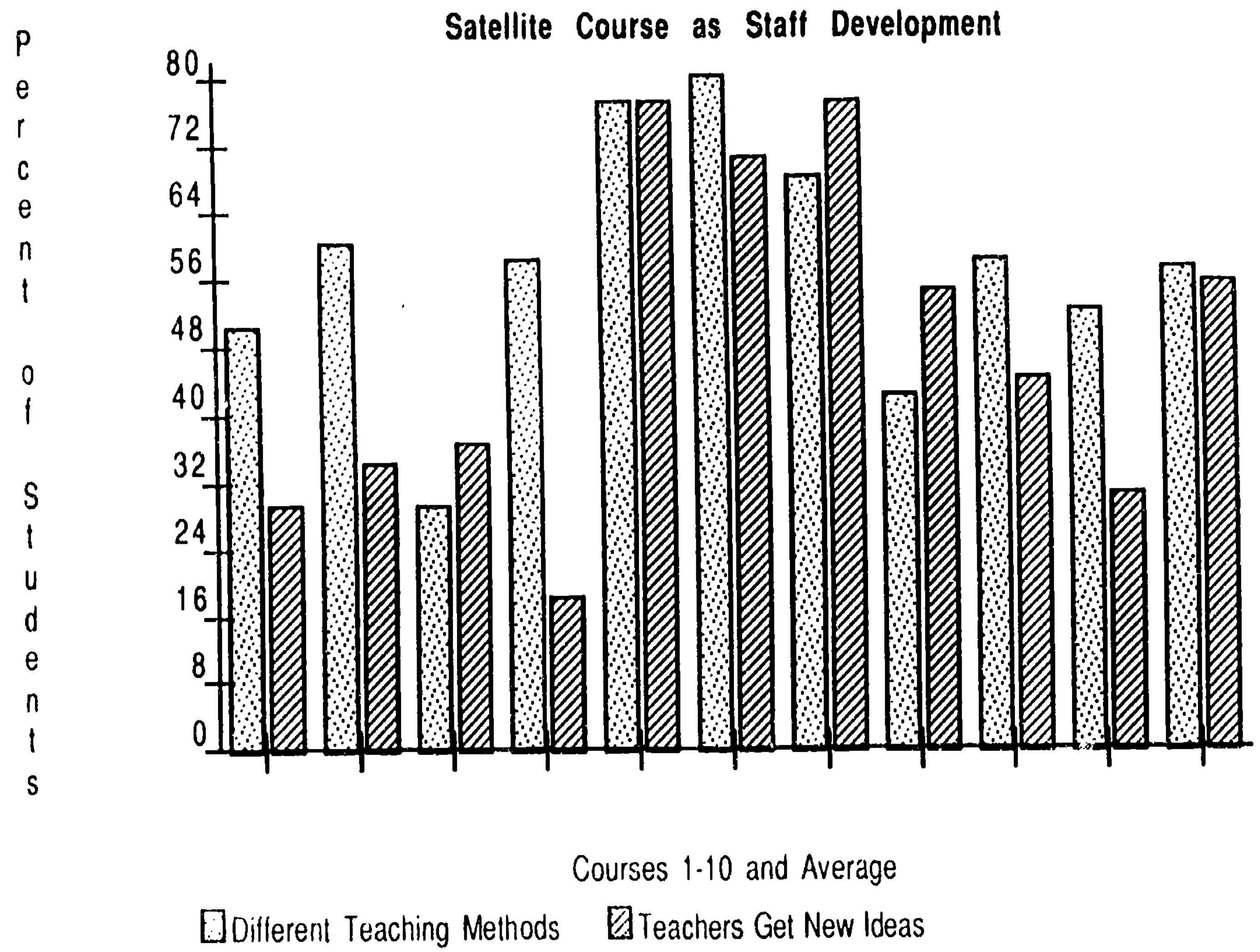

Satellite Course as Staff Development
percent of Students
80
72
64
56
48
40
32
24
16
8
0
Courses 1-10 and Average
Different Teaching Methods
Teachers Get New Ideas

Figure 17

Course Perceived as an Opportunity

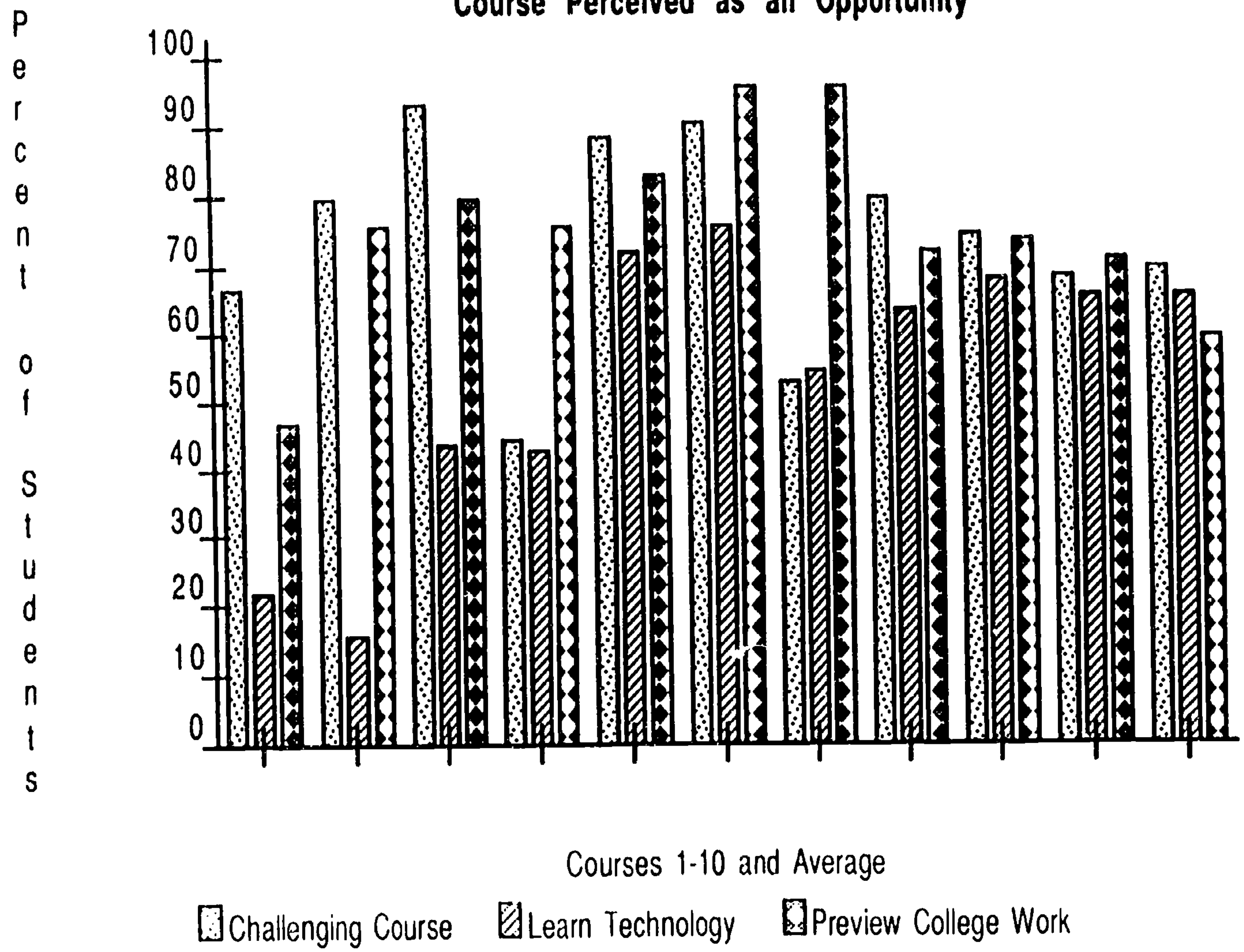


Figure 18

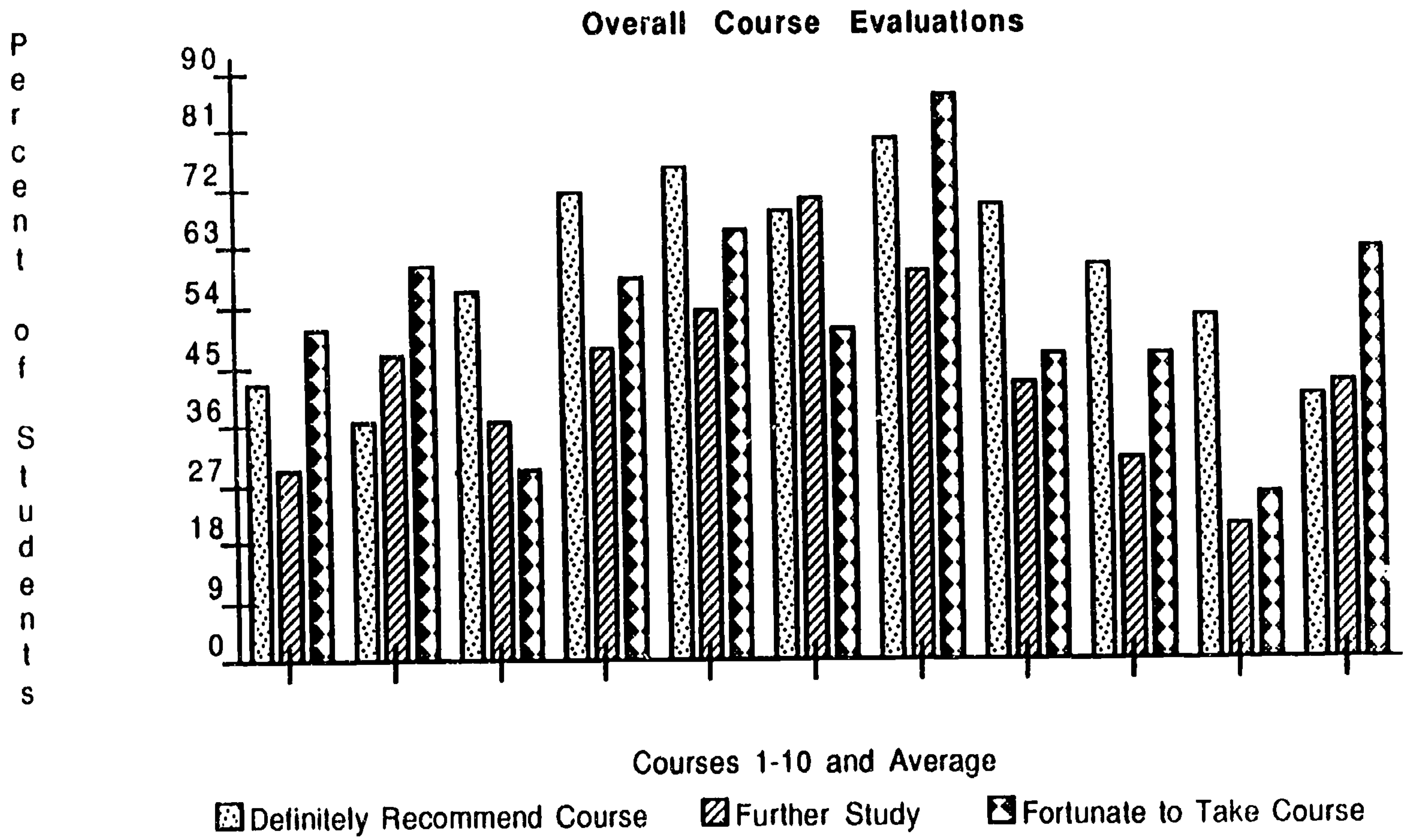

Overall Course Evaluations
Percent of Students
90
81
72
63
54
45
36
27
18
9
0
Courses 1-10 and Average
Definitely Recommend Course
Further Study
Fortunate to Take Course

Figure 19

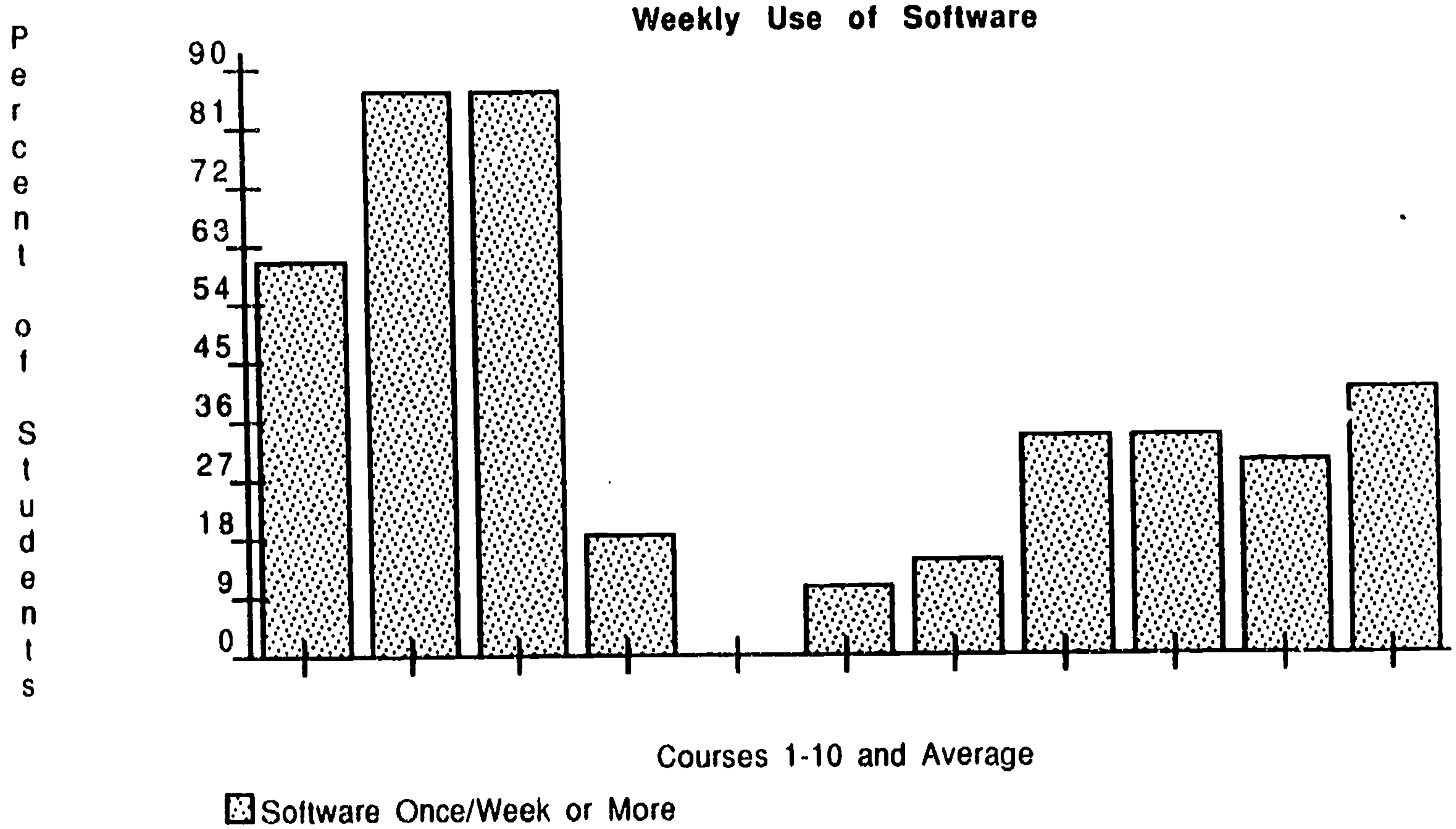
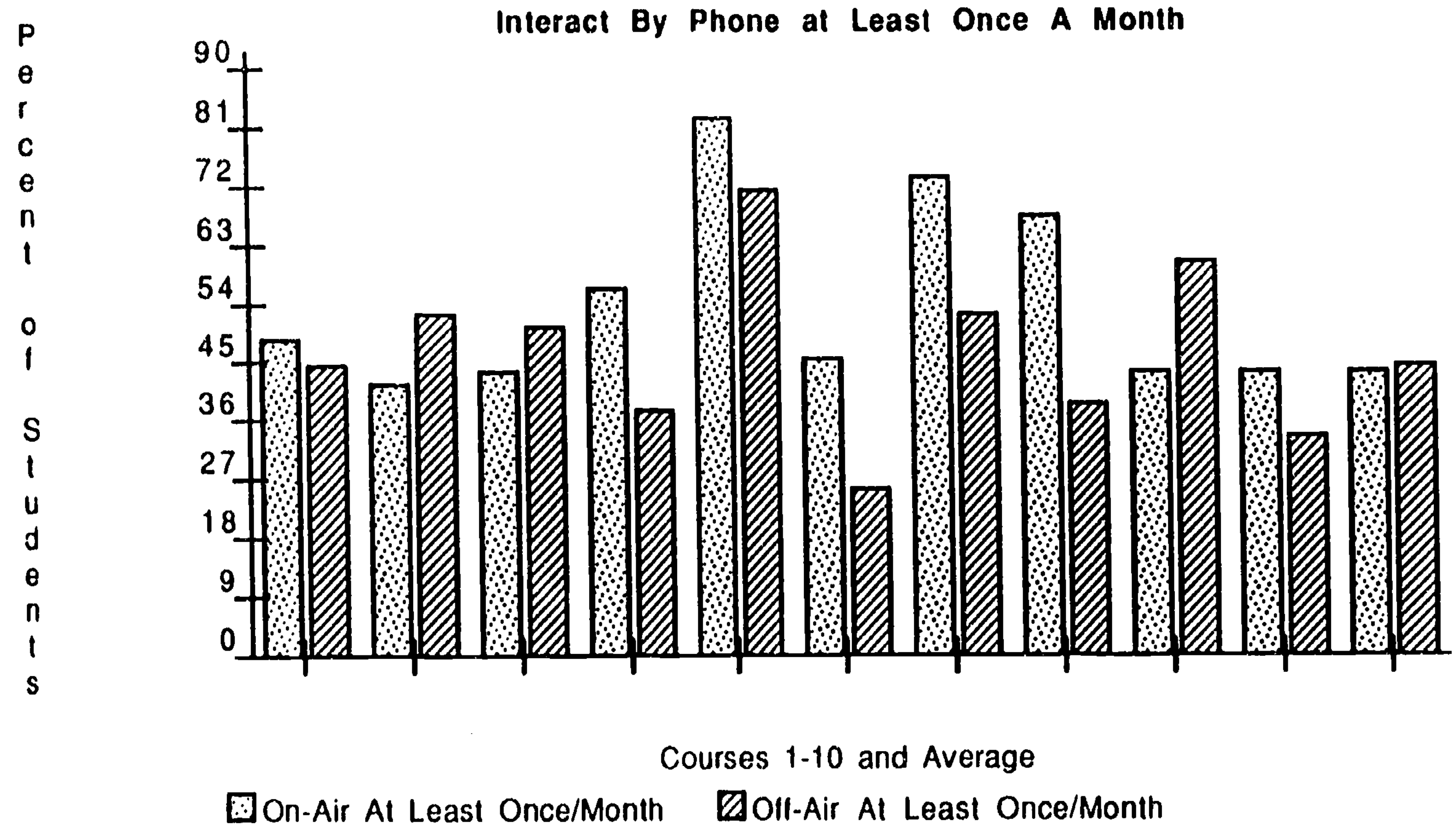

Weekly Use of Software
Percent of Students
90
81
72
63
54
45
36
27
18
9
0
Courses 1-10 and Average
Software Once/Week or More

Figure 20


Interact By Phone at Least Once A Month
Percent of Students
90
81
72
63
54
45
36
27
18
9
0
Courses 1-10 and Average
On-Air At Least Once/Month
Off-Air At Least Once/Month

III. RESEARCH

III. RESEARCH

The Midlands Consortium Research and Evaluation Center had a two-part mission related to research: (1) to sponsor and support investigations by others, and (2) to undertake a significant program investigating the effectiveness of satellite instruction. The investigations by other researchers will be described first in this section. That will be followed by a description of the comprehensive research program based at the Center for Educational Testing and Evaluation at the University of Kansas and sub-sections describing each investigation's design and findings.

Sponsoring and Supporting Research by Others

The Midlands Consortium Research and Evaluation Committee, acting through the offices of the state directors, issued a request for proposals for small grants to faculty and graduate students to do research on instruction by satellite. A sample of the call for proposals is included in **Appendix F**. In June 1989, the Midlands Consortium Research and Evaluation Committee members read 13 mini-grant proposals and decided to fund five of them. Proposals were evaluated on the basis of their potential contribution to a theoretical understanding or model of distance education delivered by satellite. The five studies were conducted in the 1989-90 academic year. Brief summaries immediately follow, and complete reports are included in **Appendices G through H**.

Project Title: Interaction analysis of Spanish by satellite
Principal Investigator: Loren Alexander
Institution: Kansas State University

A study of classroom interaction in Spanish by Satellite, by Loren Alexander and Kye Attaway, found in **Appendix G**, investigated the accuracy and usefulness of the "Teacher and Student Linguistic Interaction Tally Sheet" in ten schools receiving the Spanish I course provided by Kansas State University. The Kansas State University Spanish I by satellite course was taught by live television two days a week with no studio class present. The teaching partners in the schools received training prior to and during the course, and were treated as full-fledged professional educators capable of classroom management and interaction. Although few began the course with skills in the Spanish language, their work included helping students with Spanish speaking exercises. This paper reports on an analysis of oral language interactions in several classrooms throughout the academic year. Its focus reflected a major concern of experts in the field of language learning/acquisition: Whether and to what extent the mother tongue should be used in second-language instruction. The authors employed an interaction analysis tool to answer such questions as the following: (1) How much English vs. Spanish does the teaching partner use? (2) How much English vs. Spanish do the students use? (3) To what degree are these utterances actual communication vs. drill? Students and teaching partners in the schools, university students and faculty carried out the recording of data or "tallying." Seven schools, representing approximately 10% of the schools taking Spanish I completed the study. When tallies were summed and averaged to obtain the percentage of English and Spanish in the classroom and by television, the authors found an average of 51% English. The amount of English used by the teaching partners averaged 59%. Alexander and Attaway concluded that the interaction analysis tool had been successfully employed by several talliers, and had generated data with sufficient inter-rater reliability. One finding was that students used more of the target language in class than the teaching partners. Subsequent analyses revealed that the relative amounts of English and Spanish used in a particular classroom were not related to student achievement.

Project Title: Survey of the Kansas distance learning/teaching partner and principal
Principal Investigator: Rosemary Talab
Institution: Kansas State University

Rosemary Talab and Robert Newhouse studied the role and task perceptions, training and receptivity to technological change on the part of Kansas teaching partners. Their complete report is found in **Appendix H**. This study used survey and interview methods to collect information from 33 teaching partners. The survey and the interview schedule were pilot-tested on a similar group of distance educators not participating in this study. A seven-item phone survey of 12 principals collected information on performance, colleagues' perceptions of the role of teaching partner, likelihood that the teaching partner would use technology in other classes as a result of the satellite program, and whether the teaching partner actually did make more use of technology. Principals were also asked what criteria they had used to decide which teacher should serve as a teaching partner. Demographic data were used to construct a profile of the typical teaching partner as a female with a master's degree, who had been a teacher for 6-10 years, was 35-44 years old, had five other preparations besides the satellite class, and did not speak another language besides English.

Talab and Newhouse found that the degree to which teaching partners perceived themselves to be change agents correlated with their perceptions of the value of the experience and training they had received, and with a positive attitude toward the introduction of new technology. Talab and Newhouse found that teaching partners believed networking with other teaching partners was critical to success of the satellite course. For a new technology to be successful, there must be hands-on training that involves a high degree of interaction; an opportunity during the televised lessons for regular interaction between the students, the on-air instructor and the teaching partner. There should be a compelling reason for adopting this technology, if possible, one that benefits the teaching partner as well as the students.

Project Title: "The introduction of satellite television in Kansas rural schools: Two intensive case studies"
Principal Investigator: Robert Hohn
Institution: University of Kansas

Using a case study approach, Robert Hohn and Mark Byrne compared two classrooms in two rural schools during their first year of satellite television. Four students, categorized as high or low in motivation, and using television to learn either science or language, were targeted for specific profiling. An account of their adaptation to the new technology was based on their grades, their satisfaction with the course, information from a personal diary kept by each of the four students, and observations of their behavior in the classroom. Second, a detailed description of the setting was developed based on comments by the teacher and other members of the class. Organizational variables pertinent to using the new technology, such as allocation of resources and changes in scheduling were also investigated. The complete report, found in **Appendix I**, includes recommendations on how to achieve a successful adaptation to satellite instruction on the part of students, teaching partners and production staff.

Hohn and Byrne looked at two satellite courses in two subject areas by two different producers (one being Midlands Consortium). Since Hohn and Byrne did not include any conventional classes, they could not draw conclusions about the effectiveness of satellite instruction as compared to conventional instruction. But they did draw several conclusions based on comparing the two models of satellite instruction, differing in the number of days per week when on-air instruction was provided; the role and training of the teaching partner or facilitator; and the skills of the on-air instructor. They concluded that learning by satellite can be effective in terms of student performance and attitude if certain preparatory steps are taken, namely: (1) defining the role and responsibilities of the facilitator or teaching partner; (2) organizing the classroom; and (3) choosing a program not simply on its content, but also with regard to the on-air instructor and the support system to be used. Hohn and Byrne went on to say that a balance must be achieved between the on-air instructor and the facilitator or teaching partner. A monopoly by either one in terms of content, student interaction, or grading "will result in a dysfunctional and unproductive class." They also concluded that the classroom facilitator or teaching partner must support the use of technology in the classroom; disinterest or disdain will usually result in poor learning. They also said that enrollment should not exceed ten students, otherwise students cannot see the television well enough. Hohn and Byrne also warn that school personnel should obtain sample tapes and as much information about the program and the on-air instructor as possible, and notify the program producer when they detect problems. Nevertheless, the introduction of satellite instruction can offer students opportunities for exposure to subject areas, expert teachers and expensive instructional support materials otherwise unavailable.

Project Title: Isolating effective computer-aided instruction approaches in a distance learning environment
Principal Investigator: James D. Wells
Institution: Oklahoma State University

James D. Wells' study, found in **Appendix J**, documents the incorporation of a "transparent monitoring program" to the existing record-keeping software in the Russian by Satellite course in order to increase the amount of statistical data recorded for each student. The Russian by Satellite personnel hoped comparison of data thus obtained could be compared to similar data from college and high school students using software as an adjunct to normal instruction. The Russian by Satellite staff planned for the expanded Student Records System to facilitate answering such questions as: Which questions did students answer correctly? How many times did they attempt the question before succeeding? Did learners improve from first to last attempt? What was the relationship between primacy and recency in the retention of grammatical morphemes? However, many problems were encountered while attempting to implement this innovation. In the long run, this paper may be most memorable as a case study in the adaptation of computer-assisted language instruction.

Wells reported that students' scores on computer drills improved by 30-50% with practice. Because early in the semester, teachers reported that students were copying answers off their neighbors' screens, the Russian by Satellite instructional staff felt compelled to randomize the drill questions. There was a significant drop in the use of the computer drills in Chapter II. Students' failure to master those drills led to problems in later lessons. The staff developed a separate verb diskette, independent of Chapter II, which was widely used by students and solved many problems. Evaluation data collected concerning the newly adopted software indicated that the computer component of the program was received positively and was considered helpful to the majority of students. Some 72% said the computer component was their favorite part of the course, and 73% said they learned the most from the computer drills, compared to 14% for the homework, and 13% for the broadcast. Wells concluded that the computer can and should be an integral part of any distance learning language program since it can to some degree substitute for a live teacher who can interact on an individual basis with students.

Project Title: Innovation and instructional telecommunications: The integration of satellite technology and the professional development of public school teachers
Principal Investigator: Connie Dillon
Institution: University of Oklahoma

Connie Dillon's study of the integration of satellite technology and the professional development of public school teachers is found in **Appendix K**. A questionnaire was distributed to 282 teaching partners; 95 responses were returned. A educational profile of the respondents indicated that 88.5% had completed work beyond the bachelor's degree, and nearly two-thirds had been employed as a teacher for over 10 years. A majority said their training was "not applicable" to their role as a teaching partner. Teaching partners indicated that the activities that are most important in the satellite class are mailing exams, and facilitating student communication with the satellite instructor and staff. The activities which are least important in the satellite class are preparing and grading exams, leading discussion, answering questions, organizing class activities, lecturing and curriculum design. Activities of about the same importance included maintaining discipline, providing computer support, motivation, mentoring, and keeping students on task. Open-ended items assessed teaching partners' perceptions of the contributions of the experience to their personal and professional development. The most common response related to the opportunity to learn about and acquire confidence in a new content area. Others discussed the opportunity to learn about new technologies and teaching methods. Many participants mentioned the opportunity to mentor with other teachers, and said they valued their relationship with the satellite instructor.

Dillon concluded that the professional development opportunities provided by the satellite teaching experience are very positive. The opportunity to network with other teaching partners had in some cases helped rejuvenate their enthusiasm for teaching. The relationship between the teaching partner and the satellite instructor can make a unique contribution to professional development. However, for a minority of individuals, the exact role that teaching partners should play was problematical, leading to comments such as: "I feel like a baby sitter," and "the teacher needs only to be a strict disciplinarian." Another concern raised by Dillon was the discrepancy between what teaching partners actually do and what they feel is important that they do. Dillon also said that "teacher education programs should investigate the possibility of offering study in the techniques of distance teaching."

One might hazard a few generalizations about these four studies, together with the interaction study (reported below) by the University of Kansas Research and Evaluation Center. Each study provided a different kind of evidence that the level and quality of interaction, whether between satellite instructor and students, between satellite instructors and teaching partners, between teaching partners and students, among teaching partners or among students, makes a major contribution to all participants' affective experience with satellite learning. The contribution to achievement is harder to pin down, perhaps because interaction influences individual motivation, which in turn affects achievement, which co-varies with prior achievement. Another generalization concerns the collaborative or cooperative nature of the satellite instructional model adopted by the Midlands Consortium courses, and how the teaching partner's role is defined within that model. Ideally, the local teacher working with a satellite course serves as a true partner. Anything less might be perceived as an insult, because the studies by Dillon and by Talab and Newhouse found that the average teaching partner has several years of experience and education well beyond the bachelor's degree. Studies of satellite instruction by Dillon (Midlands courses) and by Hohn and Byrne (one Midlands course and one course by another producer using a different model of satellite instruction) indicated that if local teachers do not play a role which is carefully defined and professionally challenging, student learning suffers, and the quality of the learning experience suffers for both students and teachers.

The University of Kansas Research and Evaluation Center Studies

The Research and Evaluation Center at the University of Kansas also undertook an active as well as ambitious program of investigations. Four research studies of the effectiveness of Midlands Consortium courses for students--using several different definitions of effectiveness--were designed, approved by MCREC in June 1989, and carried out with the cooperation of Oklahoma State and Kansas State University satellite instructors and hundreds of local school teachers. All studies were planned to offer reasonable research design controls relying on measurements and statistical methods that heighten the precision and power of analyses. Each inquiry was designed to achieve maximum generalization of findings.

One criterion of effectiveness is how well satellite students do on standardized subject-matter achievement tests compared to students in conventional classes. Such comparisons were possible in five of the eleven subjects taught by Midlands Consortium producers. Other measures of student learning and course outcomes were solicited, including grades, self-reported learning, expected grade and overall rating of the course.

Another criterion of effectiveness is whether satellite instruction only benefits select students, for example, those who are high in ability or motivation, or whether average students can also learn from it. Student characteristics considered for this research included learning style, type or level of motivation, prior achievement, self-rated academic ability, racial/ethnic group, and parents' educational level.

A third criterion of effectiveness related to students' perceptions of learning environments. Components of perceived learning environment include the extent to which the class was cohesive or goal-directed; teacher support and control; the extent to which teachers or teaching partners help develop students' skills in studying and learning on their own; and other teacher skills (organizing, simplifying and relating ideas) and characteristics (enthusiasm). The design of this part of the research recognized the possibility that students with different entering abilities and attitudes may perceive the same course experience quite differently. For example, a highly-motivated and self-confident student might find almost any environment supportive while a less motivated or less-confident student might find a lack of support which interfered with their learning.

A fourth criterion of effectiveness addresses the comparative question of whether students instructed via satellite learn at rates equal to their peers in conventional classes. To allow the comparative question to be evaluated, conventional comparison classes were always recruited from the same collection of small rural schools that were subscribing to courses by satellite. For example, a school might be taking Physics by Satellite but offering Spanish as a conventional class. Students in the Spanish class contributed data to the conventional Spanish experimental group, which would be compared to students taking Spanish by Satellite. It would not be appropriate to compare a conventional class in a big urban or suburban school to a satellite class in a small school in a rural area. This recruiting process was an attempt to identify equivalent groups.

Two other set of issues related to effectiveness concern the contribution of live interaction to students' learning and their reactions to the satellite course, and secondly, the relationship of parents' educational backgrounds to students' learning and to the frequency of their self-reported phone interactions with the satellite instructors.

The following research questions were investigated:

1. How important is the live, interactive feature of instruction in influencing cognitive and affective outcomes? Is the opportunity for live interaction related to achievement? Do students whose parents had more education tend to interact more or learn more? What is the relationship between district characteristics, interaction and achievement at the class level?

Study 1 compared student achievement in classes viewing satellite instruction live vs. those watching it on tape; and in more vs. less interactive learning populations. The role of interaction was analyzed at the class level in one satellite course, and at the individual student level for all courses. The class-level analyses of interaction and achievement in one course by satellite, to be reported first, make use of a log of phone interactions maintained by one satellite course's instructional staff, along with data on district characteristics. After that first investigation of interaction at the class and district level, a second set of analyses, including all the satellite courses, at the level of the individual student will be reported. Those analyses make use of the same individual achievement data as Studies 2-4, along with students' survey responses concerning their phone interactions with course instructors and concerning the levels of education attained by their parents. The two sets of analyses are separate because some schools furnished data for the class-level analyses but did not participate in the larger data collection effort. In other words, these two sets of analyses of the role of interaction are based on separate and distinct data bases, so the tables reported for the second interaction study should not be used to understand the first interaction study.

2. How much and how well do students learn in satellite courses? Is satellite instruction effective for all students or only the most highly-motivated or highly-skilled learners? Which students benefit most? (In other words, what role do individual differences play?)

Study 2 compared students characterized by different learning styles, skills and motivations on cognitive outcomes measured by grades, standardized tests and overall course rating.

3. How effective are satellite courses compared to conventional courses?

Study 3 compared students in courses taught conventionally to courses taught by satellite with broadcasts two or three days a week and supplemental activities the other days in terms of student achievement on standardized tests, and other outcomes.

4. What influence do contextual features such as classroom climate, satellite instructor or teaching partner characteristics have on student outcomes?

Study 4 examined how contextual features contribute to different kinds and levels of student outcomes.

When schools subscribed for Midlands courses, they were notified by the producing institution (either Oklahoma State or Kansas State University) that evaluative information would be gathered from students enrolled in the satellite courses. In a novel, and what proved to be an effective methodology, conventional comparison classes were obtained by identifying and selecting a comparable course offered at a site that was receiving another satellite course. District superintendents, building principals and teachers at schools subscribing to Midlands courses by satellite were contacted by mail and invited to participate. Superintendents, principals and teachers at over 200 schools in 14 states volunteered to participate in these investigations. At the end of the year, 246 teachers were still participating. Information from the satellite instructors gave reason to believe that this volunteer sample was fairly representative of schools that subscribe to courses by satellite--not weighted in favor of schools doing well, schools doing poorly, schools who were trying a course by satellite for the first time, or schools who had subscribed to satellite courses in previous years.

Complete data were not made available for all students, classes or courses. Some teachers returned the first survey but did not send a roster giving students' racial/ethnic background or their incoming grade point averages. Some schools decided to provide only portions of the data sought. Some teachers administered the first survey but not the second, or the second survey but not the first. Some agreed initially to give standardized tests but returned them unfinished. Approximately 3400 students participated in some phase of the research program, but because of missing data obtained from students and schools, the number of usable cases did vary widely by analysis.

Since one of the major purposes of the Star Schools legislation was to extend new educational opportunities to students "at-risk," economically disadvantaged or racial/ethnic minority students, some analyses pay particular attention to these kinds of student, class or district characteristics. Research on distance education at the post-secondary level has long indicated that adult students who are highly motivated and have good study skills have little difficulty learning at a distance. But the professional research literature had given few examples of the successful or unsuccessful implementation of satellite instruction K-12 education in general or specifically for students "at-risk." For the purpose of the studies described below, "at-risk" status was defined in terms of an absence of motivation; a lack of interest in schoolwork; and tendencies to think simplistically, emphasize short-term memorization, and invest little time or effort in studying.

Description of research samples: Comparing students in satellite to those in conventional courses

Educators sometimes wonder if courses by satellite attract a different mix of students than conventional courses in the same subjects at comparable schools. At the beginning of each course, data were collected from students in each class section participating in the research investigations on various student characteristics including: incoming grade point averages and self-rated academic ability (typical grades, class rank), racial/ethnic group, gender, and parents' educational level, type of motivation for taking the course, persons who encouraged them to take the course, whether English is the primary language spoken in the home, and typical attributions for success or failure in a course. The following statistics describe students who participated in this study, not the total population of Midlands Consortium course by satellite students.

Table 1 summarizes the racial/ethnic background data for satellite students participating in the research studies.. A cross-tabulation of racial/ethnic background by satellite course indicated that 81% of the students in this sample of 1447 students were classified by their teachers as being White, 1.7% American Indian, .4% Asian/Pacific Islander, 15.5% African American, 1.4% Hispanic and .3% other. White studen were enrolled in all eleven courses, African American students in ten courses, while A ican Indian students were enrolled in Physics (4), Basic English and Reading (3), Ge n I (15), German II (2) and Russian (1). In this sample, 33% of the AP Calculus by satellite students were African American, compared to 65% White and 2% other. African American students comprised 53% of the enrollment in Basic English and Reading by satellite. The percentage of African American students in other satellite courses ranged from a low of 2% in Applied Economics and AP American Government to 17% in Spanish and 18% in Physics. Four Hispanic students took Spanish, nine Basic English and Reading, five German I, one Russian and one American Government by satellite.

Table 2 summarizes data from a cross-tabulation of racial/ethnic backgrounds for the 1188 students participating in the research who were taking conventional courses--taught entirely by a local teacher without any televised instruction. White students, comprising 78% of this sample, enrolled in all 11 courses. However, African American students, comprising 19% of all conventional course students, were enrolled in only six courses: 99 in Spanish, 8 in Trigonometry, 16 in Chemistry, 56 in Economics, 38 in American Government, and only 12 in Basic English and Reading.

There was no significant difference between the racial compositions of the satellite sample and the conventional sample, with a chi-square of 10.48 ($p > .10$).

Table 3 shows the number and percent of the satellite students in each course who were viewing the programs live, on tape, or some combination of live and taped viewing. Cross-tabulations of viewing by course indicated that 828 students viewed the satellite courses live, while 576 saw them on tape, and 55 saw some mixture of live and tape. Across all satellite courses, an average of 39% always viewed the programs on tape. Only three courses had students who sometimes saw the program live and sometimes saw it on tape: Applied Economics (13), Basic English and Reading (23) and German I (19). The three courses with the highest percentage of students viewing the satellite course on tape were German II with 72%, Basic English and Reading with 49%, and American Government with 48%. The courses with the lowest percentage of students viewing the satellite course on tape were Chemistry (15%), Trigonometry (22%) and Physics (21%). Across all courses, 57% of the 1459 satellite students for whom this information was available see the programs live, while just over one-third usually watch them on tape This information was furnished by the teaching partners rather than by the students.

In the satellite sample, 4% or 55 students came from homes where English was not the primary language spoken, while only 2% or 29 of the conventional students came from such homes. However, there was no significant difference between the satellite sample and the conventional sample in the proportion of students from homes where English was the only language, with a chi-square of 7.14 ($p > .13$). Eight of the satellite students from non-English speaking homes were in the Spanish class, 17 in Basic English and Reading and 16 in German I; seven conventional students were taking Spanish, six Economics, eight Basic English and Reading, and two German I. **Table 4** provides a comparison of the percentages of students from homes where English is the primary language for all courses in both the satellite and conventional delivery treatment groups. The satellite Basic English and Reading course had over 10% of its students coming from homes where English was not the primary language, while only 5% of the conventional students came from such homes.

Table 5 summarizes the data on typical grades reported by satellite and conventional students. In this sample, students in the satellite courses report having received higher grades in prior courses than students in the conventional classes. Based on students' self-reports, 58% of the satellite and 37% of the conventional students said their entering grades were mostly A's and B+'s; 25% of the satellite and 29% of the conventional students said their grades were mostly B's and a few B+'s. Twice as many conventional (24%) as satellite (12%) students said they typically get C or C+ grades; 8% conventional compared to 3% satellite students said they usually get C's and a few D's; and 1.5% satellite and 2.1% conventional students said they usually get D's and a few F's. As **Table 6** indicates, another measure of self-rated academic ability was asking students how they ranked in their class the previous semester: 39% of the satellite and 24% of the conventional students said "among the best"; 29% of the satellite and 43% of the conventional said "average"; less than 3% of the satellite and 7% of the conventional students said their rank was "below average." There was a significant difference between the typical grades of the satellite sample and the conventional sample, with a chi-square of 160.84 ($p > .01$). This confirms the widespread impression that students coming into the satellite courses had slightly higher grade averages than those in the conventional courses.

Students were asked why they took that particular course, and the differences in motivation between the satellite and conventional groups were rather striking as well as being statistically significant, with a chi square of 321.44 ($p < .01$). For example, 24% of the satellite students but only 9% of the conventional students said they were intrinsically motivated--"very interested in the subject." An external or extrinsic motivation was chosen by 14% of the satellite and 42% of the conventional students, saying "Someone made me take it. It was required." There were fewer differences on the vocational or instrumental motivation, "To prepare for college or a career," which was chosen by 45% of the satellite and 37% of the conventional students. "There was no other course I wanted to take," was chosen by 5.3% of the satellite and 4.8% of the conventional students. "Other" reasons were cited by 12% and 6% of the conventional students. **Table 7** summarizes students' responses concerning their motivations for taking the course.

As **Table 8** indicates, there were some observed differences between satellite and conventional students on the question of who was most responsible for their taking the course. "No one, I decided on my own" was chosen by 58% of the satellite and 46% of the conventional students. "My parents or other family members" was the reason chosen by 5.4% of the satellite and 3.4% of the conventional students. "A school administrator or guidance counselor" was chosen by 23% of the satellite and 43% of the conventional students. "A teacher" was chosen by 9% of the satellite and 4% of the conventional students. "Other students" was the answer chosen by 3.8% of the satellite and 3.5% of the conventional students. The biggest difference between the satellite and conventional groups was in the third category, with almost twice as many conventional students saying a guidance counselor or administrator had encouraged them to take that particular course. The differences between the satellite and conventional groups were statistically significant, with a chi square of 129.47 ($p < .01$). One possible explanation might be that conventional students were taking courses which were required or which they were urged or expected to take; while satellite students were taking the courses as electives, by their own choice.

One item administered early in the academic year asked students "When you do really well in a course, which of the following explanations do you usually give?" There was a slight tendency for satellite students to give more internal attributions for success (chi-square = 14.77, $p < .01$), namely: "You worked hard," and "Your are good in that subject." There was no significant difference between satellite and conventional students in their attributions when they do poorly in a course (chi-square = 1.9, $p > .75$). There was a slightly greater tendency for satellite students to disagree that luck is more important than hard work in success (chi-square = 13.24, $p > .01$). **Tables 9-11** summarize the attribution data for the satellite and conventional students. Over 80% in each group indicated that success is due to hard work rather than luck.

Interaction, Socioeconomic Status and Achievement in One Course By Satellite: Analyses at the Class Level

What is the relationship between district characteristics, interaction and achievement at the class level?

In Midlands Consortium courses, live instruction is provided two or three days a week. A classroom teaching partner monitors student viewing and directs planned activities on non-broadcast days. During satellite transmissions, several schools are audio-bridged directly into the studio so students can interact with the instructor (without having to dial in) as the other schools listen. Some classes only interact on those occasions when they are designated host schools, while some call in more often during the programs, or take advantage of other opportunities for telephone interactions, for example, by using the toll-free number to talk to the instructor or assistants. Classes which were expected to call during that program were randomly selected and identified at the beginning of the broadcast, and each class was supposed to be bridged once in every eight-day period.

When whole classes are audio-bridged into the studio and interact with the instructor as a group, it becomes possible to evaluate the relationship between interactivity and achievement outcomes, using the class, rather than the individual student, as the unit of analysis. Since a major goal of federal Star Schools legislation was to enable economically disadvantaged, rural, Chapter 1, and ethnic minority students to take foreign languages and advanced courses in mathematics and sciences, this investigation also explores the relationship of socioeconomic status and proportion of minority students within a district to interaction and achievement outcomes. The proportion of students in the district who are eligible for free or subsidized lunches was used as a proxy for socioeconomic status, since a district where 90% of the students are eligible was assumed to be less affluent than one where only 15% are eligible. It was hypothesized that schools in the most disadvantaged districts might interact to a lesser extent because of their traditional technological and cultural isolation (not because of cost, because the calls were toll-free).

An issue for school personnel to consider is whether the re-scheduling necessary to allow students to have satellite instruction live is really justified, compared to taping the programs for viewing at a more convenient time. Course producers also wonder if the expense of providing opportunities for live interaction is justified in terms of student achievement or makes a difference in the quality of students' learning experience. One complication for investigating the role of interaction is due to the fact that some classes did view the satellite instruction on a tape-delay basis. Although the instructor in this particular satellite course encouraged students viewing the course on tape to call in at other times, those contacts were usually initiated by the school, rather than by the instructor. It was found that classes viewing tapes had significantly fewer interactions than classes viewing the live instruction, but there were no significant differences in achievement between the live and tape groups. Since taped viewing in and of itself was not related to achievement at the class level, for this set of analyses, the small number of classes viewing taped instruction was combined with the other classes with fewer interactions.

Midlands Consortium satellite course instructors and their staffs maintain logs of telephone calls received both during and between broadcasts. This study made use of one such log from a foreign language class, along with achievement data obtained from the instructor, and district-level data obtained from superintendents concerning the dropout rates in their district, and the percent of students who receive Chapter 1 services, receive free or subsidized lunch, or are racial or ethnic minority. Achievement data were in the form of a composite score representing both tests and daily work. The purpose of this study was to answer such questions as the following: Do students in less affluent districts learn in a course by satellite? Do they take advantage of interactive opportunities to the same extent as students in more affluent districts? Do students in districts with a high proportion of Chapter 1 students interact and achieve to the same extent as students in districts with a smaller proportion of such students? Is the number of interactions related to achievement?

Procedures

The log of interactions by phone was carefully analyzed and converted to a standard format, coding each interaction by name of school; type of caller (teacher or student); type of interaction (equipment problems, question about course content, question about the course structure or requirements, class participation in response to instructor, or other); and, whether the call was during the satellite broadcast or at another time.

This study made intensive use of interaction data made available by one satellite instructor rather than making cross-course comparisons. No models for handling this kind of data had been found in the research literature, and developing a new procedure was a trial and error process. It was difficult to quantify these interactions consistently enough to permit comparisons among schools. Finally, a subjective judgment was made to count the number of days rather than the number of speakers on a particular day, which would have been weighted in favor of schools with higher enrollments in the class. Another quantitative issue concerned those days when a school called in but did not get on the air. Such calls were not included in the count.

So few calls were logged on non-broadcast days that the distinction between on-air and off-air calls was dropped for this analysis. Teaching partner and student interactions were not separated for this analysis. Some classes only interacted when they were designated host schools, others called far more often, and this, rather than type of interaction or caller seemed to be the most important distinction emerging from the log data. All interactions from one school on a given day were counted as one interaction, and all categories of interaction were collapsed together into a simple count of recorded calls by school. Correlations were calculated with other variables of interest.

Results

Data were obtained for 64 schools subscribing to this satellite course, representing approximately two thirds of the schools subscribing during the 1989-90 academic year. The average class enrollment was 8.67. The number of interactions per class ranged from 0 to 19. The mean was 5.375, the mode was 6. The percentage of students in a district who were eligible for free or subsidized lunches ranged from 4% to 93%. The mean was 47%, the median was 45%, but the mode was 60%. The achievement variable represented the class average composite score including both tests and daily work. These scores ranged from 639.7 to 948.3, with a mean of 801.0. Incoming class mean grade point averages were made available for 27 classes, and ranged from 1.959 to 3.71, with a mean of 2.937. Classes with higher mean grade point average at the beginning of the course had significantly higher achievement at the end.

The data were subjected to a series of correlational analyses. The correlations of mean class achievement with interactions, and of class average incoming grade point averages with interactions were not statistically different from zero ($p > .05$).

Content analysis of the logs led us to investigate whether larger classes needed interactions on more broadcast days than smaller classes to give everyone a chance to speak. Based on data from 64 schools, the correlation between class size and interaction was in the predicted direction but extremely small. Especially in a foreign language class in which learner-learner interactions between broadcasts would seem to be important, and in a course by satellite in which the teaching partner is not expert in that language, one wonders if the smallest classes would not be at a disadvantage in terms of achievement because there are so few people with whom to talk. The correlation between enrollment and achievement was not statistically significant. Apparently, explanations for differences in achievement and interaction must be sought elsewhere.

Using data from 50 districts, correlations of the number of interactions with the proportion of Chapter 1 students in the district--reflecting both comparative economic disadvantage and patterns of low achievement--were not significant.

Using data from 51 districts, correlations using the proportion of students receiving free or subsidized lunch as a way to compare the socioeconomic status of districts were interesting. There was a non-significant negative correlation of "Lunch" to "Achievement" (-.27), while the only significant correlation of the group was between "Lunch" and "Interaction" (-.53). Apparently students in the poorer districts did interact significantly less, but the relationship of "Lunch" to "Achievement" was weaker.

The same data were subjected to other types of analyses to yield different kinds of insights. Perhaps the difference between eight and nine interactions is not so important and there is no reason to expect higher achievement with nine than with eight interactions. Perhaps it is more important to distinguish classes whose interactions were above or below average and compare those two groups on the achievement variable. An analysis of variance with achievement as the dependent variable, and high or low interaction as the independent variable, showed that classes interacting more than the average of six times had significantly higher achievement than those interacting less than six times ($p < .05$). However, and this point should be underscored, this effect disappeared when the analysis was repeated controlling for incoming grade point average.

An analysis of variance with interaction as the dependent variable and proportion of students eligible for free or subsidized lunches (high=above 50%, low=below 50%) showed that classes in the low group--assumed to be more affluent districts had significantly more interactions ($p < .001$) than classes in the high group--assumed to be less affluent. However, once again, this effect disappeared when the analysis was repeated controlling for incoming grade point average.

Discussion

It was hypothesized that classes whose interactions predominantly concerned equipment problems might have lower achievement than classes whose interactions concerned content issues. A careful reading of the logs suggested that even when teaching partners were calling primarily about equipment problems during the broadcast, their students were better off than if there were no interactions at all. Some schools experienced more equipment problems than others, which may have affected their students' achievement and motivations. However, these districts experiencing more equipment problems tended to have a lower proportion of students eligible for the subsidized lunch program. One such school had a mean class achievement of almost 90%, but others reporting frequent equipment problems had below-average achievement. It should be remembered that teaching partners' abilities and general skills play a role here, because some teaching partners had better technical coping skills than others. It should also be remembered that school-level decisions concerning placement of equipment sometimes inhibit students' interactive capabilities. For example, ignoring all advice to the contrary, some schools keep the phone in the principal's office instead of in the classroom.

Although the instructor encouraged students viewing the course on tape to call in at other times, those contacts were usually initiated by the school, and that group of classes had significantly fewer recorded interactions than those classes that viewed the programs live. However there was no significant difference in achievement between the live and tape groups for this course.

The disadvantages of satellite instruction (for example, occasional problems with equipment, differences in vacation schedules, and school closings due to bad weather in different districts and different states) are concrete and specific and can make a quantitative difference in students' opportunities to interact with the TV instructor. But it would be a mistake to overlook the advantages of satellite instruction--which may be more abstract and intangible and which affect the quality of interactions. Other technologies provide reliable communication, and even the possibility of two-way video, within a smaller geographical area. But this course by satellite brought together students and teachers as far apart as eastern Montana and the gulf coast of Mississippi. Interaction logs for the Friday teaching partner programs provided evidence of the course's intangible benefits. Students in districts with a history of low achievement and cultural isolation were challenged and inspired by the instructor and by their fellow students. Some classes began corresponding with each other across the miles, using the new language they were learning. The highest composite score in this course was earned by a student in a class where all the students were black, at a district where 40% of the students are eligible for Chapter 1 services, 93% are eligible for subsidized lunches, 92% are minority, and the district dropout rate is 35%.

The original research question asked: "How important is the live interactive feature in influencing cognitive and affective outcomes?" This set of analyses did not indicate that interaction made much of a contribution to achievement at the class level. But that result is not a satisfactory stopping place. Clearly many complex factors are involved with interaction, achievement, and course effectiveness, so that the kind of data used, the way variables are quantified, and the level of analyses can make a great deal of difference in results of the study. This investigation found that students in less-affluent districts interacted significantly less, but that significant difference disappears when incoming grade point average is entered as a covariate. A Kansas State University doctoral student collected dissertation data in the state of Louisiana, in classes using courseware from other producers. Ford (1990) found significantly fewer phone interactions by classes in less affluent districts. Differences in how classes react to the interactive component of satellite instruction appear to be a worthwhile issue for further research, if satellite instruction supplemented by phone interactions is to continue to extend educational opportunities to economically and geographically disadvantaged areas and students with low prior achievement. While the differences in the total number of interactions did not affect achievement on the class level, there may be other effects that should be investigated, perhaps using other methodologies.

To repeat a caution mentioned earlier, this investigation of the relationship of interaction, district characteristics and achievement made use of a different data-base than the following studies, a data-base including district level data collected for OERI (see **Tables 1-6** in the **Evaluation Section**), the log of interactions and class-level achievement data from one satellite instructor. In this particular satellite course, interactions served the purpose of recitation and participation more than as an exchange of open-ended questions and answers. There may be large differences among satellite courses in the nature of interactions as well as their frequency and importance. Although it requires some tolerance for ambiguity and subjective judgment, analysis of log data may be a fruitful avenue for future researchers, yielding different kinds of insights than the large-sample studies reported below.

Interaction, Parents' Educational Attainment and Student Achievement in Courses By Satellite: Analyses at the Individual Level

1. How important is the live, interactive feature of satellite instruction in influencing cognitive and affective outcomes? Is the opportunity for live interaction related to achievement? Do students whose parents had more education tend to interact more or achieve more in satellite courses than students whose parents had less education?

As indicated earlier, in Midlands Consortium courses by satellite, students can call the instructors individually or as a class, during the live broadcasts, or at other times. Near the end of the 1989-90 academic year, students were asked how often they called in with questions or to get information during the course. They could choose among the following responses: (1) never called, (2) called once or twice, (3) three to five times, (4) six to ten times, (5) more than ten times.

Along with data on the levels of interaction, the analyses reported below made use of students' responses concerning the levels of education attained by their parents. Near the beginning of the academic year, students were asked: What is the highest grade your mother achieved in school? and: What is the highest grade your father achieved in school? For each of those items, they could pick one of the following responses: (1) eighth grade or less, (2) started but did not finish high school, (3) high school graduate, (4) started college but did not graduate, (5) college graduate. The achievement data consisted of end-of-course grades in nine of the satellite courses, and subject-area achievement tests administered in five of the satellite courses.

Although some occupations requiring many years of formal education are not very highly rewarded in this society, and some individuals with relatively little formal education manage to earn high incomes, across all occupations, sociological research tends to show a strong positive correlation between education and income. So the analyses reported in this section relate, at least indirectly, to the effectiveness of satellite courses in providing educational opportunities to students from lower income families. The research questions addressed in this section include the following: Did students whose parents had more or less education tend to perform differently in satellite or conventional courses? Did students whose parents had more education tend to do better in terms of end-of-course grades or achievement test scores? Other research questions relate only to the satellite group: Did students who called in more frequently get better grades or higher test scores? Did students whose parents had more education tend to call in more often? That finding would resemble the result found at the previously-reported district-level study. Presumably these students might be more self-assured or more comfortable with long-distance phone communication. In the class-level analyses reported above, districts where more than half the students were eligible for the subsidized lunch program did call or interact significantly less than classes in districts where less than half were eligible. Would a similar relationship between interaction and parents' educational levels (as an indication of socioeconomic status) be found across courses, using data from individual students?

Other research questions to be addressed in this section concern the issue of live vs. taped viewing. Did students who watched the instruction on tape call in significantly less than students who watched the programs live? Did students who saw taped instruction get lower grades or test scores than those who watched the live telecasts? Did students who watched the live broadcasts give significantly better overall ratings to their satellite courses than those who viewed the same instruction on tape?

Results

Grade point averages at the beginning of the year and end-of-course grades were made available for 775 students who had supplied information about their fathers' education. That 775 included 476 students in satellite and 299 students in conventional classes. To allow for combining data from nine different subject areas, end-of-course grades were converted to standard scores. The rationale for this conversion is that, in contrast to "raw scores," standard scores indicate how far each student's score, grade or grade point average is from the group mean. A negative z score indicates that particular student scored below the group mean; a positive z score indicates that a student scored above the mean. When working with test scores, one advantage of conversion to standard scores is being able to compare tests with different means and different numbers of items. Each student's grade can be described in terms of its distance from the group mean rather than as a raw score or proportion of the number of correct items on a particular test.

Students' Achievement in Relation to Their Parents' Education

Tables 12-13 and **Figures 1-2** illustrate relationships between the educational levels attained by satellite and conventional students' parents and their achievement in terms of grades. The dependent variable, end-of-course grade was submitted to a two-factor analysis of variance with the independent variables being satellite vs. conventional delivery (or "treatment"), and the level of education attained by students' fathers. **Table 12** shows the grades obtained by students in each treatment group (satellite, conventional) whose fathers attained each level of education, controlling for students' prior achievement. The average standardized grade for all 476 students in the satellite group was -.02, which was lower than the average standardized grade of .17 for the 299 students in the conventional group. That difference was statistically significant ($p < .01$), but this analysis of variance revealed no main effect for the level of education attained by the father ($p > .05$). **Figure 1** illustrates the data in **Table 12**. For students in conventional classes, there was a consistent upward trend: as the fathers' education increased, students' grades got higher. Although satellite students whose fathers graduated from college had higher grades than the other groups, there was no consistent upward trend of improvement in grades with the increasing level of education attained by the father. Conventional students tended to get higher grades than satellite students, but the effect of the level of education attained by the fathers (which often has a high positive correlation to income) did not reach statistical significance.

The dependent variable, end-of-course grade, was submitted to a two-factor analysis of variance with the independent variables delivery and mothers' educational levels. **Table 13** shows the grades obtained by students in each treatment group whose mothers attained each level of education, controlling for students' prior academic achievement. The average standard grade for all 477 students in the satellite group was -.02, while the average standard grade for the 307 students in the conventional treatment group was .16. Once again, there was a main effect for delivery or treatment ($p < .001$), but not for the level of education attained by students' mothers. Looking at the difference among educational levels only in terms of trend because the differences were not statistically significant, **Figure 2** indicates that, except for the small number of students whose mothers did not start high school, in both satellite and conventional treatments, as the mothers' education increased, students' grades got higher.

In five subject areas, nationally standardized subject-area tests were administered at the end of the academic year. Since the tests in these five subject areas had different means and different numbers of items, within each subject area, students' raw scores on these tests were converted to standard (z) scores, making it possible to compare scores obtained in different subject areas. **Tables 14-15** and **Figures 3-4** illustrate relationships between the educational levels attained by satellite and conventional students' parents and their achievement in terms of test scores. The dependent variable, achievement test score, converted to a standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being delivery and the level of education attained by students' fathers. **Table 14** shows that the average z score for all 297 satellite students was .11, while the average for all 244 conventional students was -.14. There were no main effects for either fathers' education or delivery. Because there were no main effects, **Figure 3**, based on the data in **Table 14**, should not be over-interpreted. Keeping that in mind, **Figure 3** shows that the small number of satellite students whose fathers dropped out before high school did better on the standardized tests. Conventional students whose fathers started but dropped out of high school did slightly better than the satellite students on the standardized tests, but at all other levels of education, the satellite students' had higher scores.

The dependent variable, achievement test score, converted to a standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being delivery and the level of education attained by students' mothers. **Table 15** shows that the average z score for all 297 satellite students was .12, while the average for all 245 conventional students was -.14. There were no main effects for either mothers' education or for delivery. Since there were no main effects, **Figure 4** should not be over-interpreted, but it suggests little difference between the satellite and conventional treatment groups at the lowest educational level or at the level of college graduate. Satellite students whose mothers started high school, completed high school or started college did better but the differences were not statistically significant.

Achievement in Relation to Interaction and Parents' Education

Tables 16-17 and **Figures 5-6** illustrate relationships between the educational levels attained by satellite students' parents, their achievement in terms of grades, and the frequency of their interactions. The dependent variable, end-of-course grade, converted to a standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by students' fathers and the number of times students reported calling the satellite instructor. Two levels of interaction, calling one or two times, and calling three to five times, were collapsed together for this analysis. So, four levels of interaction were analyzed: (1) never called, (2) called one to five times, (3) called six to ten times, and (4) called more than ten times. There was a significant main effect for interaction frequency ($p > .01$), but not for the fathers' educational level ($p < .05$). As **Table 16** indicates, a total of 148 satellite students out of the 366 who could be included in this analysis never called their instructors (40%). Another 168 students called from one to five times (46%), and 50 students (14%) called six or more times. Students who said they never called had an average z score of -.22, compared to .50 for those who interacted at the highest level. **Figure 5** indicates that the most interactive students usually got better grades than the less interactive students whose fathers attained the same level of education.

The dependent variable, end-of-course grade, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by students' mothers and the number of times students reported calling. There was a significant main effect for the number of calls ($p > .01$) but not for the mothers' educational level ($p < .05$). **Table 17** is similar to **Table 16** in suggesting that students who interacted at the highest level usually got better grades than other students whose parents attained the same level of education. Other combinations of student interaction and mothers' educational levels, shown on **Figure 6**, were not consistent.

Tables 18-19 and **Figures 7-8** illustrate relationships between the educational levels attained by satellite students' parents, their achievement test scores, and the frequency of their interactions. The dependent variable, achievement test standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by students' fathers and the number of times students reported calling. As indicated in **Table 18**, a total of 246 satellite students could be included in this analysis. There was only one student whose father had the lowest level of education and who called in more than ten times, and that student performed at an exceptionally high level, as shown by **Table 18** and **Figure 7**. There were no main effects for frequency of calling or for the fathers' educational level ($p < .05$). **Figure 7** indicates a general tendency for students who interacted at the highest level to have better test scores.

Finally, the same test-performance variable was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by the mothers and the number of times students reported calling. This analysis also included 246 satellite students. There were no main effects. But in contrast to **Tables 16 and 17** depicting performance in terms of grades, **Tables 18 and 19** show a consistent tendency for test performance to improve as the level of phone interaction increased.

<u>The Effectiveness of Live vs. Taped Satellite Instruction</u>

The comparative effectiveness of viewing satellite instruction live as opposed to viewing it on a tape-delay basis is an issue with important economic and administrative implications. Analyses of variance were used to investigate this issue in terms of three types of effectiveness, focusing on grades, test scores and overall rating for the course.

The dependent variable, end-of-course grade, was submitted to an analysis of variance, controlling for prior achievement, with the independent variable being live or taped viewing. The average grade, converted to a standard score, for the 470 satellite students who could be included in this analysis was -.04; the average for the 295 students who viewed the instruction live was .03; the average for the 175 students who viewed the instruction on tape was -.17. That difference was not statistically significant ($p > .05$). Evidently watching the programs live did not give students an advantage in terms of grades.

The dependent variable, achievement test score, was submitted to a one-factor analysis of variance, controlling for prior achievement, with the independent variable being live or taped viewing. The average test score, converted to a standard score, for the 286 satellite students who could be included in this analysis was .09; the average for the 149 students who viewed the instruction live was .02; the average for the 137 who viewed the instruction on tape was .17. The difference between the achievement test scores for the live and tape groups was statistically significant ($p < .05$) with the tape group having the advantage. But because of the relatively smaller number of courses and students who could be included in this analysis, we should view these results with caution.

Finally, to find out whether students who watched the live telecasts gave satellite instruction a higher overall rating than those who viewed the same programs on tape, that dependent variable was submitted to a one-factor analysis of variance, controlling for prior achievement, with the independent variable being live or taped viewing. On this dependent variable, a lower number indicates a more favorable rating. The average overall rating for all 788 satellite students who could be included in this analysis was 2.47; the average for the 499 students who viewed the live telecasts was 2.40; the average for the 289 who viewed the instruction on tape was 2.59. That difference was statistically significant ($p < .05$). Students who viewed the instruction live, who had the option of participating in live, simultaneous two-way audio interaction with the instructor and with students at other locations gave significantly better ratings to their satellite courses.

Discussion

On the issue of live vs. taped viewing, this investigation yielded no indication that satellite students' achievement in terms of grades or test scores suffers when they cannot participate in two-way interaction during the live broadcasts. However the significant difference between the overall ratings given by the live and taped groups suggests that students perceive a qualitative difference.

In this society, the traditional model of children living with both parents is no longer so common. Even if the surveys administered at the beginning of the year would have asked students whether their household was headed by their mothers or their fathers, having that additional information available would not have contributed very much toward understanding their home environments. While some of the young people who participated in this study were living in two-parent families, others were living with one parent all, most or some of the time. Non-resident parents might have been an extremely strong influence in the lives of some of these young people, but had almost no influence on others. Some students might have been living with a grandparent or other care-giver, but the level of education attained by their mothers and fathers might still have had a bearing on their economic and social circumstances. For all students, whether they were living with one parent, two parents, or in some other type of family unit, the educational level of the father might be more related to their economic circumstances, while the education of the mother might have had more effect on child-rearing practices, socialization or cultural standards in the home. Large-sample studies using relatively short surveys devoted primarily to other issues are not well-suited for making those kinds of distinctions. Other researchers might profitably tackle issues of parental influence and home environment. We simply asked students about the educational level attained by each parent, analyzed their responses for mothers and fathers separately or independently.

The underlying purpose of the analyses just described was to shed some light upon an issue debated by Jere Brophy and Beau Fly Jones (see the **Monograph Section** of this report) as to whether the benefits of mediated instruction are confined to the self-confident sons and daughters of the well-educated and well-off, while disadvantaged students have a greater need for direct, teacher-led instruction. Throughout this **Research Section**, several types of evidence will be presented suggesting that students with various types of educational, social, or economic disadvantages are no worse off getting part of their instruction in a mediated form--in this case, by means of satellite--than they are in classes which are entirely teacher-led.

The data illustrated by **Table 12** and **Figure 1** sugg[illegible] that the level of education attained by fathers made more of a difference in conventio[illegible] [illegible]an in satellite courses. That at least suggests that satellite courses do not aggrava[illegible] [illegible]ting social inequities. However, before making too much of these results, it w[illegible] [illegible] best to design a new study focusing precisely on these issues, and obtain more near[illegible] [illegible]al samples of students whose fathers or mothers attained each level of education. [illegible]o, the analyses reported in this section did not include the course or subject-area variable, largely because the number of students in some subject areas who participated in this study was not large enough to bear further subdivision into parents' five educational levels and still maintain adequate cell sizes for all the various courses. In Study 3, reported below, course or subject-area differences were often more impressive than differences between the two delivery systems. In order to analyze subject-area differences, student achievement and parents' educational attainment, future researchers would naturally want to design a study with a narrower focus, and with more nearly equal samples of students in different courses. Until such a study is carried out, we can draw some tentative conclusions by interpreting **Figures 1-8** in terms of trends.

Ignoring, for a moment, the small number of students whose mothers dropped out before high school, **Figure 2** indicates that as the level of education attained by the mothers increased, end-of-course grades increased for both the satellite and conventional students. Students whose mothers were college graduates appear to have had more of an advantage in the conventional classes than on the satellite classes.

The differences between **Figure 3** showing the fathers' educational attainment and **Figure 4** showing the mothers' educational attainment may be due to the size of student samples and to particular characteristics of the five subject areas that participated in this phase of the research. **Table 14** suggests that the satellite students who could be included in that analysis did better on the standardized tests than the conventional students who could be included in that analysis. **Figure 3** shows that the small number of students whose fathers did not even start high school did extremely well on the standardized tests in relation to all other groups. It is possible that students whose fathers dropped out of school so early had extra motivation or worked extra hard and obtained better scores than students whose parents started high school but did not graduate. On the other hand, their unusually high average score may be because that group was smaller, so that one outstanding student could have had a disproportionate influence on that group's mean. It would be ill-advised to make too much of this result without further research including the course variable, with more equal samples, and focusing uniquely on these questions. The smaller number of courses that could be included in the analyses of test score as opposed to grades might also explain the unusually high average test score for satellite students whose fathers had the lowest educational level.

Some educators believe that students from disadvantaged backgrounds are less likely to learn from mediated instruction. The Midlands Consortium studies suggest that is not necessarily true, at least not at the secondary level and in the predominantly small rural schools being served by satellite instruction. Finding that students whose parents stayed in school longer (and who might thus be able to provide more economic and social advantages to their children) did not learn any more or get significantly higher grades is reassuring. This result suggests that satellite instruction was successful in providing achievement and learning opportunities to students whose parents did not have them.

In interpreting the results of all the Research and Evaluation Center studies, it must be remembered that this research design does not permit us to draw conclusions relating to causes and effects. Thus, while **Tables 16-19** and **Figures 5-8** indicate that students who interacted at the highest level tended to get the best grades and test scores, we do not know whether the tendency to interact was an individual characteristic or a response to the instructional situation, and we do not know whether or to what degree frequency of interaction actually contributed to achievement. This result is not surprising since interaction is a form of learner activity, and active students learn more than passive ones. After studying interactivity as a factor in learning from both television and computers, Chen (1986) said that researchers should consider the possibility that passivity and interactivity are qualities of learners, not just qualities of media (see the **Monograph Section** for further discussion of Chen's work). Furthermore, we can only wonder how the students who never called nevertheless managed to do as well as they did. Perhaps the results for the remaining three studies will offer some clues.

Individual Differences and Achievement in Satellite vs. Conventional Treatments

2. How much and how well do students learn in satellite courses? Is satellite instruction effective for all students or only the most highly-motivated or highly-skilled learners? Which students benefit most? (In other words, what role do individual differences play?)

This research question compared students characterized by different learning styles, skills and motivations on quantifiable outcomes measured by standardized tests. There are many different ways of defining and measuring individual differences, and the following section describes the one chosen for this study.

Perspectives or Theoretical Framework

Entwistle and Ramsden (1983) developed an inventory to measure several dimensions of study attitudes and behavior at the college level. Their "Approaches to Studying Inventory" included subscales assessing holistic and serialist learning styles, levels of cognitive processing--deep or surface, organized or disorganized study habits and type of motivation: interest, academic (competitive, grade-oriented), instrumental/vocational, fear of failure, and lack of motivation or interest in schoolwork. Based on factor analyses of that and subsequent instruments adapted for the secondary level (Kozeki and Entwistle, 1987), four general approaches to studying have been identified. Students using a Meaning Orientation are motivated by interest in what they are learning, are actively involved with what they are learning, and try to see relationships among ideas. Students using a Strategic Orientation are less interested in learning for its own sake and more interested in playing the system to get good grades and employment qualifications. They are competitive, self-confident, have a high need for achievement, and often are very organized and methodical in their study habits. Students using a Reproducing Orientation try to memorize or rote-learn disconnected pieces of information, are motivated by fear of failure, and are not especially good at picking up cues as to what is expected of them. Students using a Non-Academic Orientation are unmotivated, uninterested in their studies, and disorganized in their study habits.

Methodology

Two student survey instruments were developed specifically for this study, based on "About Me and My Schoolwork" and "About This School," developed by Kozeki and Entwistle (1987) to study interactions between student characteristics and secondary school climate. The first survey, administered in September-October 1989, also called "About Me and My Schoolwork," asked students about their learning style preferences, motivations and study habits, without special reference to the satellite or conventional class they were in. This survey provided a way to classify students into the four orientation subgroups described above. This survey used a scale of 1 to 5 (1=Strongly Agree, 2=Agree, 3=Neither Agree Nor Disagree, 4=Disagree, 5=Strongly Disagree); lower scores on an item indicated more agreement with that item, and the lowest scores on a subscale indicated the strongest agreement with the five items on each subscale. After computing a Meaning, Strategic, Reproducing and Non-Academic Orientation score for each student, the lowest of those four scores, was used to classify each student into one of the four groups. This classification was not meant as a permanent label, but only as an approximate description of how individual students saw themselves functioning as learners at that point in time. It should be noted that the word "orientation" will be used to distinguish the four scale names (Meaning, Strategic, Reproducing and Non-Academic) from the names of the subscales that are combined into those four orientations, such as Strategic Approach and Surface Approach.

End-of-course grades and incoming grade point averages were obtained for 448 satellite and 296 conventional students who took the first survey. The dependent variable, end-of-course grade, was quantified in the following manner. End-of-course grades obtained from satellite instructors, teaching partners or teachers, were converted to a 15-point scale (+A=15, A=14,-A=13, +B=12, B=11, -B=10, +C=9, C=8, -C=7, +D=6, D=5, -D=4, +F=3, F=2, -F=1). Grade point averages at the beginning of the year and end-of-course grades were converted to standard (z) scores for each subject area and for each treatment (satellite or conventional). In other words, there is an average end-of-course grade and test z score available for all students, all satellite students, all conventional students, all satellite students in each subject, and all conventional students in each subject area.

Near the end of the course, students were asked to give their overall rating of the course, with the possible answers being 1=among the best, 2=above average, 3=average, 4=below average, 5=among poorest.

Results

Grade point averages at the beginning of the 1989-90 academic year, and end-of-course grades were made available for 757 of the students who took the first survey assessing orientations to studying. This 757 included 462 satellite and 295 conventional students. Within the satellite treatment group, the scoring formulas and procedures mentioned above worked in such a way as to consider 202 students "Meaning-Oriented," 132 "Strategic," 100 "Reproducing," and 28 "Non-Academic." Within the conventional treatment group, this procedure identified 103 Meaning-Oriented, 79 Strategic, 77 Reproducing and 36 Non-Academic.

To allow for combining data across different courses, end-of-course grades were converted to standard scores. Standard scores indicate how far each student's score, grade or grade point average is from the group mean. A negative z score indicates that student scored below the group mean; a positive z score indicates that student scored above the mean. These standard scores were then submitted to a two-factor analysis of variance with the independent variables being delivery (satellite, conventional) and orientation to studying, controlling for incoming grade point average. Significant main effects were found for the independent variables, orientation to studying and delivery ($p < .001$). There was no interaction. The means for each of the eight subgroups and the number of students in each subgroup are shown in **Table 20**. In **Table 20** the row averages in the far right column show that the average end-of-course grade was higher for conventional students. The column averages indicate that students using a Strategic Orientation did better than students using a Meaning Orientation in satellite courses, but the same was true of conventional courses. **Figure 9** illustrates the patterns of achievement for the four student types or orientations subgroups are the same for satellite and conventional treatment groups.

Grade point averages at the beginning of the year and subject-matter achievement test scores were made available for 528 (288 satellite, 240 conventional) students who took the first survey. Within the satellite treatment group, this analysis identified 112 students in the "Meaning-Oriented," 85 in the "Strategic," 68 in the "Reproducing," and 23 in the "Non-Academic" subgroups. Within the conventional treatment group, 89 students were sorted into the "Meaning-Oriented," 60 into the "Strategic," 73 into the "Reproducing," and 18 into the "Non-Academic" subgroups. The same type of analysis was done with test scores, converted to standard or "z" scores, controlling for grade point average. There were main effects for approach and delivery ($p < .01$). The means for each of the eight groups and the number of students in each subgroup are shown on **Table 21**. The row averages in the far right column in **Table 21** show that the satellite students had a higher average standard score (.11) than the conventional students (-.13).

Near the end of the course, students were asked to give their overall rating of the course, with the possible answers being: 1=among the best, 2=above average, 3=average, 4=below average, 5=among poorest. Therefore, a lower mean indicated a better rating. Overall rating of the course was submitted to a one-factor analysis of variance with the independent variable being orientation to studying--a combination of several student characteristics including motivation, study habits, level of cognitive processing and learning style.

For satellite students, the differences among orientation subgroups were significant ($p < .01$). For this item, a lower mean represents a higher or more favorable rating. The subgroup means were: 2.41 for Meaning Orientation, 2.54 for Strategic Orientation, 2.65 for Reproducing Orientation, 2.84 for Non-Academic Orientation. A Scheffe multiple range test was used to compare pairs of means and locate the source of the significant difference(s). The significant difference was found to be between the Meaning-Oriented and Non-Academic subgroups.

For conventional students, the differences among orientation subgroups were significant ($p < .001$). The subgroup means were: 2.53 for Strategic Orientation. 2.52 for Reproducing Orientation, 2.13 for Meaning Orientation, and 2.06 for Non-Academic Orientation. A Scheffe multiple range test was used to compare pairs of means and located the source of the significant difference between the Strategic and Non-Academic groups.

Discussion

In **Table 20**, the row averages in the far right column indicate that mean end-of-course grades were lower for satellite than for conventional students. The column averages indicate that students using a Strategic Orientation did better than students using a Meaning Orientation in satellite courses, but the same was true of conventional courses. **Figure 9** illustrates the patterns of achievement for the four student subgroups.

One of the major purposes of the Star Schools legislation was to extend new educational opportunities to students "at-risk." Research on post-secondary distance education has long indicated that adult students who are highly motivated and have good study skills have no trouble learning at a distance, but previous research had not provided much information about less highly-motivated or academically-talented students at the secondary level. To address this research question, "at-risk" status was defined in terms of an absence of motivation, tendency to think simplistically and invest little time or effort in studying. There were main effects for approach and delivery, but **Figure 9** suggests that, according to that definition, the patterns of achievement in each of the two treatment groups (satellite, conventional) were not different. While all students tend to get lower grades in satellite classes, the "at-risk" students did not appear to be at a particular disadvantage compared to other students in satellite classes.

Figure 10 shows that the same learning skills that helped the Strategic Orientation subgroup get higher grades must have helped them do well on the subject matter tests. Satellite students in the Non-Academic Orientation subgroup did quite well on the standardized tests, and much better than Conventional students in the same subgroup. Students assigned to the Reproducing Orientation subgroup (on the basis of their subscale scores on the first survey) had the lowest test scores in both satellite and conventional treatments. Other studies have found that students in that subgroup get especially anxious about tests, which might have lowered their performance compared to the Non-Academic subgroup. Since (even in conventional classes with one teacher on-site) students in the

Reproducing Orientation subgroup by definition are not especially good at picking up cues about what they need to learn or accomplish in order to get a good grade, one might have expected them to be at a greater disadvantage in satellite as opposed to conventional classes. But **Figures 9 and 10** do not indicate any particular disadvantage for this group in satellite as opposed to conventional classes.

For purposes of this research study, the most important observation from **Figure 10** is that the patterns for each of the four orientations to learning subgroups are very similar in the satellite and conventional treatments.

On the basis of **Figures 9 and 10** and **Tables 20 and 21**, students whose self-descriptions at the beginning of the year resulted in their being considered part of the Non-Academic or Reproducing Orientation groups were not especially disadvantaged by satellite instruction (by not having an on-site teacher certified in that subject). The differences among the four types of students in the satellite or conventional treatment groups in their overall ratings of the courses may offer some of the most powerful evidence in favor of the opportunities provided by satellite instruction. The cross-tabulations of students' self-rated academic abilities at the beginning of the year showed that the satellite treatment group included a smaller percentage of students in the lower ranks of their graduating classes.

The differences among orientation subgroups were significant for both satellite ($p < .01$) and for conventional students ($p < .001$). For this item, a lower mean represented a better or more favorable rating. It is less important or instructive to compare means for each subgroup in satellite to conventional than it is to compare various pairs of means within each treatment group and note their order. Students in the Non-Academic Orientation subgroup gave the lowest overall ratings for courses in both the satellite and conventional treatments. The Strategic Orientation students who, by definition, care more about getting a good grade than they care about learning and understanding the material, gave the second most favorable rating in satellite courses but gave the most favorable rating in conventional courses. That was no surprise, because grades are significantly lower in satellite as composed to conventional courses. Finding that it was the Meaning-Oriented students who gave the best overall rating to the satellite courses should be encouraging to anyone involved with satellite instruction. Midlands Consortium was especially committed to providing educational opportunities to capable, motivated and deserving students who were anxious to learn if given a chance, and this is but one indication that it accomplished that objective, and that those students appreciated the opportunity.

Comparisons of Satellite and Conventional Classes on End-of-Course Grades and Test Scores

3. How effective are satellite courses compared to conventional courses (in terms of cognitive outcomes)?

Introduction

The burning question on many peoples' minds is whether students learn as much or as well in courses by satellite as in conventional courses in the same subject. In order to address this issue, two assumptions had to be made: that grades measure learning to some extent, and that standardized subject-matter tests measure learning to some extent. For this research, standardized subject-matter tests were chosen with the advice of satellite instructors and conventional local teachers. Satellite instructors and conventional teachers were asked to comment on the instructional validity of the tests, and decisions as to which tests to use and which classes to involve in analysis were based on this information.

To address the comparison question, end-of-course grades were requested from satellite instructors, teaching partners and conventional teachers; and, where available, Advanced Placement Exam scores were requested from guidance counselors. Standardized subject matter tests were administered in five of the satellite courses. Seven satellite instructors agreed to share end-of-course grades. Teaching partners furnished grades for some of the other courses. In the satellite treatment group, the satellite instructors recommend final grades, but local teaching partners have the final say in what grades are assigned. In the analyses reported below, in order to diminish the effect of local grading standards, class average end-of-course grades were converted to z scores. In all cases, precautions were taken to protect students' rights to privacy and confidentiality. Advanced placement scores were made available for a small number of students in two subject areas. In one course, a large number of conventional students took the same test that the satellite students were taking. But that satellite course had a sponsoring agency (other than Midlands Consortium) that would not release those scores, so that comparison was lost. In one course, a standardized test was already given to the satellite students as a final exam, and some conventional teachers agreed to give it in their classes. The same type of comparison was planned in another course, but the satellite instructor would not release the satellite students' scores, so that comparison was lost. In three courses, the same exam was given to both satellite and conventional classes. As a final result, comparisons of satellite and conventional treatment groups on subject-matter achievement test scores could be derived across five subject areas.

Student as unit of analysis

End-of-course grades were converted to a 15-point scale (+A=15, A=14,-A=13, +B=12, B=11, -B=10, +C=9, C=8, -C=7, +D=6, D=5, -D=4, +F=3, F=2, -F=1). Grade point averages at the beginning of the year and end-of-course grades were converted to standard (z) scores. Standard scores indicate how far each student's score, grade or grade point average is from the group mean. A negative z score indicates that student scored below the group mean; a positive z score indicates that student scored above the mean. One advantage of converting to standard scores is being able to compare tests with different means and different numbers of items. Each student's score can be described in terms of its distance from the mean rather than as a raw score or proportion of the number of correct items on a particular test.

There were 448 students in the satellite group and their mean grade, converted to a z score, was -.03. There were 296 students in the conventional group and their mean grade, converted to a z score, was .15. The dependent variable, end-of-course grade, was submitted to a two-factor analysis of variance, using delivery (satellite or conventional), and course as the independent variables, and controlling for incoming grade point average. There were main effects for delivery ($p < .01$) and course ($p < .05$). **Table 22** shows the mean grades and number of satellite and conventional students in each course. **Figure 11** makes it easier to see, though not necessarily to interpret, the interactions of course and delivery in this particular analysis. For most courses, the conventional students' grades were higher.

The subject-matter standardized tests administered as part of this study had different numbers of items, so students' scores were converted to standard (z) scores in order to compare results for students in the five satellite courses to results for students in the five conventional courses. For this comparison, there were 300 students in the satellite group with an average z score of .11, and 130 students in the conventional group with an average z score of -.15. The dependent variable test score, converted to a z score, was submitted to a two-factor analysis of variance, controlling for incoming grade point average, with the independent variables being delivery and course. In this analysis there were no main effects, but there was a significant two-way interaction ($p < .001$) caused by course differences. Table 23 shows the mean test scores and the number of satellite and conventional students in each course. **Figure 12** compares standardized test scores for the satellite and conventional treatment groups, and shows the statistical interactions.

Class as unit of analysis

Class average end-of-course grades were converted to standard or z scores. The dependent variable, class average end-of-course grade, was submitted to a two-factor analysis of variance, with the independent variables being delivery and course, controlling for class average incoming grade point average. There was no main effect for delivery. A total of 84 classes (61 satellite, 23 conventional) could be included in this analysis. Class average end-of-course grades, converted to standard or z scores, for satellite and conventional classes and the number of classes for each course and delivery are shown on **Table 24. Figure 13** shows that the differences between satellite and conventional class average grades varied a great deal from one course to the next, but there was no significant difference between the satellite and conventional averages. There was such a small number of classes in some subjects that it is better to focus on the delivery variable and ignore course differences here.

Class average test scores were submitted to two-factor analysis of variance with the independent variables, course and delivery, controlling for class average incoming grade point average. There was no main effect for delivery. This analysis was based on a total of 55 classes (41 satellite, 14 conventional) in five subject areas. **Table 25** shows class average test scores, converted to standard or z scores, and the number of classes for each course and delivery. **Figure 14** shows the differences between satellite and conventional class average test scores varied a great deal from one course to another. Again, in some subjects, there was such a small number of classes that it is better to focus on the delivery variable rather than course differences.

Advanced Placement

Local schools were contacted and asked to provide Advanced Placement Test results. Students in four of the subjects included in this research could take the AP examination, but data became available for both satellite and conventional students in only one course. Final scores on the Advanced Placement Tests are on a scale of one to five, with a three being the minimum for receiving college credit. The average score reported for the 12 satellite students who took the Advanced Placement Test was 2.08, while the average for the three conventional students in the same subject area was 1.00. Although a substantial difference in practical terms, the statistical difference was not significant ($p > .05$), no doubt attributed to the small number of scores received.

Discussion

One conclusion that can be drawn from analyzing the small number of advanced placement test scores available is that it is possible for a student to take a course by satellite and do well on the AP examination. But preparation for that examination is not the only reason students take those courses. Center for Educational Testing and Evaluation staff contacted teachers and teaching partners by phone while trying to set up the testing part of the research study. Several pieces of information regarding the Advanced Placement satellite courses came out of these conversations. According to the local teachers, students take the advanced placement courses more for college practice than for college credit. Colleges and universities in some parts of the country do not accept advanced placement test results as credit for a college course. Sometimes students do not feel sufficiently well-prepared to take the advanced placement tests, sometimes their teachers or teaching partners do not feel they are sufficiently well-prepared and do not encourage them to take the tests. But that does not mean the advanced placement satellite courses are not "working," because students seem to be getting what they originally wanted: exposure to more challenging courses that will prepare them for college--not necessarily substitute for college courses.

Learning Environments in Satellite and Conventional Courses

4. What influence do contextual features such as classroom climate, satellite instructor or teaching partner characteristics have on student outcomes?

Research in conventional classrooms has long suggested a relationship between students' perceptions of the classroom environment and a variety of cognitive and affective outcomes. This research question concerns the effects of delivery (satellite or conventional) and course on students' evaluations of conventional teachers or satellite TV instructors in terms of their skills in (1) organizing the material, (2) simplifying the material, (3) relating ideas. Secondly, this research question encouraged investigation of the relationship of individual students' perceptions of classroom climate or context variables to achievement as defined in terms of end-of-course grades and standardized achievement test scores.

Perspectives or Theoretical Framework

Typical dimensions described in previous studies of classroom climate are teacher support, teacher control, and organization and class cohesiveness or structure (Anderson, 1982). In reviewing that literature, Fraser (1986) reported that order and organization, cohesiveness and goal direction (as perceived by students) are consistently associated with higher levels of achievement on a variety of cognitive and attitudinal aims. Ramsden, Martin and Bowden (1989) reported development of a questionnaire, rooted in traditional measures of learning environments such as the Classroom Environment Scale (Moos & Trickett, 1974), but specifically adapted for a study of what Americans might call college preparatory classes for high school seniors in Australia. One intention of their research was to be able to relate individual differences in motivation and study habits to school climate characteristics and achievement outcomes. Kozeki and Entwistle (1987) developed a similar questionnaire to identify differences in learning contexts as they relate to students' cognitive and motivational characteristics. Their learning context questionnaire ("About This School") asked students to evaluate their teachers' skills in relating ideas to everyday life, simplifying complex ideas, and organizing the structure and order of the material being presented.

Methodology

A student survey called "About This Class," developed at the Center for Educational Testing and Evaluation specifically for this study, was administered near the end of the academic year. This survey (found in **Appendix M**) focused on the class instead of the school, and (for the satellite students) took into account the unusual division of instructional labor between the local teacher and the satellite instructor. Except for treatment- or course-related variations in the titles and duties of the instructional personnel, the questions were the same for the satellite and conventional students. Several aspects of learning context would logically be most influenced by the local teaching partner: class cohesiveness and goal direction, control, and support for learning. Several aspects of learning context would logically be most influenced by the satellite TV instructor: enthusiasm, and three kinds of teaching skills--organizing, simplifying and relating the material.

The Cohesiveness/Goal Direction Subscale included such items as the following: "The teacher/teaching partner and students worked together as a team to make this course successful" and "We had a good idea of where we were going and what was expected of us in this class." The Support Subscale included such items as the following: "The teacher/teaching partner made a real effort to understand difficulties students were having with their work" and "The teacher/teaching partner helped motivate us to do our best." The Control Subscale included such items as the following: "The teacher/teaching partner made sure we paid attention" and "The teacher/teaching partner kept a close eye on whether we did our homework." The Study Skill Development Subscale included such items as the following: "We discussed how we were going to learn things with the teacher/teaching partner" and "The teacher/teaching partner talked about how we were going to study for this class."

The Skill in Organizing Subscale included such items as the following: "The teacher/TV instructor presented the lessons in a well-organized way" and "The teacher/TV instructor allowed enough time for student participation." The Skill in Simplifying Subscale included such items as the following: "The teacher/TV instructor summarized each lesson to help us see the main points" and "The teacher/TV instructor was good at making clear what we had to do." The Skill in Relating Subscale included such items as the following: "The teacher helped us make connections between different topics" and "It was easy to see how each lesson built on the ones before." The Enthusiasm Subscale included such items as the following: "The teacher/TV instructor got excited about some of the ideas we were learning" and "The teacher/TV instructor seemed to enjoy working with us."

The next section is based on analyses of variance comparing courses within the satellite and conventional treatments on students' perceptions of the classroom climate variables of Support, Control, and Cohesiveness/Goal Direction, along with their perceptions of the degree to which teachers or teaching partners took responsibility for helping students develop their study skills ("Study Skill Development"). That section also considers the effects of delivery and course on students' evaluations of conventional teachers or satellite instructors in terms of their skills in Organizing the Material, Simplifying the Material, and in Relating Ideas (or as it now called, "Skill in Explaining").

Correlational analyses were used to understand the positive or negative, favorable or unfavorable associations of classroom climate or learning context variables to achievement as measured by tests or grades.

Results of the analyses of variance

For one of the subjects taught by satellite, no comparable conventional classes could be found in small rural schools. Results for the satellite students in that class are included (at the second mark from the right on **Figures 15-22**). Results from that satellite course can be compared to results for the other satellite courses, but not to a conventional treatment group for that subject area.

In interpreting the following results, it is important to keep in mind that the survey used to measure students' perceptions of classroom climate and their evaluations of teaching had a scale of 1 to 4 (1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree). Therefore, lower scores on an item indicated more agreement with that item, and the lowest scores on a subscale indicated the strongest agreement with the five items on each subscale. A lower subscale mean for any of the variables with results shown on **Tables 26-32** indicates that students viewed the class more favorably than if the subscale mean was higher. Answers of 5 = Undecided were eliminated from consideration, and mean item responses were then used to analyze and report findings.

The traditional classroom climate variables (Cohesiveness/Goal Direction, Support and Control), quantified by means of subscale scores, were each submitted to a two-factor analysis of variance with delivery and course as the independent variables. Tables 26-28 show the cell means for each of the three traditional classroom climate variables. The dependent variable: cohesiveness/goal direction was submitted to an analysis of variance with the independent variables course and delivery. **Table 26** shows the cell means for the Cohesiveness/Goal Direction Subscale, which included items on to what extent the teacher/teaching partner and students worked together as a team, and to what extent students had a good idea of where they were going and what was expected of them. There were main effects for both course and delivery ($p < .001$), and a significant statistical interaction, which is illustrated by **Figure 15**. In some subject areas, conventional classes were seen as more cohesive or goal-directed, but there were notable exceptions, and in other courses, there was very little difference between the satellite and conventional students' perceptions of cohesiveness in the same subject area.

The Support Subscale included items about teachers or teaching partners who had motivated students to do their best and had made an effort to understand difficulties students were having with their work. There was a significant main effect for course ($p < .001$) but not delivery, and there was a significant two-way interaction ($p < .001$). The lack of difference between perceived support for learning in satellite and conventional treatments suggests that students feel no less support in the satellite classes--a finding which is educationally significant. The row average column on the far right in **Table 27** shows a slightly more favorable view for all conventional as opposed to all satellite courses. **Figure 16** indicates more clearly how small the differences between the two treatments actually were across all courses.

It is often said that one important role of the "teaching partner" is to motivate students and make sure they put extra effort into their work, and that satellite classes cannot succeed unless teaching partners are willing to exert that kind of control. On the Control Subscale, there were main effects for delivery and course ($p < .001$) and a significant interaction ($p < .01$). **Table 28** shows that conventional classes were seen slightly more favorably, but **Figure 17** illustrates that the differences between the satellite and conventional treatments in the same subject areas were again quite small.

On the Study Skill Development subscale, there were main effects for delivery ($p < .01$), course ($p < .001$), and a significant two-way interaction ($p < .001$). **Table 29** shows individual students' perceptions of the degree to which the teacher or teaching partner helped students develop their study skills. However, once again, when those means are depicted graphically on **Figure 18**, there seems to have been very little difference between satellite and conventional classes.

The next three subscales concerned students' perceptions of teacher or TV instructor characteristics or skills. Subscale means for each satellite or conventional course on the items assessing students' perceptions of the enthusiasm of the teacher or TV instructor are shown on **Table 30**. On the dependent variable, Enthusiasm, there was a main effect for course ($p < .001$) but not delivery. There was a significant interaction ($p < .001$), which is best interpreted by an examination of **Figure 19**.

On the variables, Skill in Organizing the Material, Skill in Simplifying the Material, and Skill in Relating Ideas, there were significant main effects for course and delivery and two-way interactions (all $p < .001$). It seems logical to assume that teaching by satellite requires more advance organization. However, in all subject areas, cell means indicated that satellite instructors were perceived to be less organized than conventional teachers. **Tables 31** and **Figures 20-22** show the results for these three variables--which are extremely similar.

Results of the correlational analyses using the individual as unit of analysis

Subscale scores were analyzed at the level of individual students, correlating each student's perceptions or evaluations with his/her end-of-course grade or subject matter achievement test score in order to get a sense of the relationship between these perceptions and achievement in the satellite and conventional treatments. The purpose of these analyses was to determine whether the same kinds of relationships between classroom climate characteristics and achievement is typical of both satellite and conventional instructional treatments, or whether the patterns are substantially different.

To repeat what was said earlier, the "About This Class" survey used a scale of 1 to 4 (1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree); therefore, lower scores on an item indicated more agreement with that item, and the lowest scores on a subscale indicated the strongest agreement with the five items on each subscale. A negative correlation between end-of-course grade (converted to a standard or z score) and a classroom climate subscale score indicates that the more each student agreed with the subscale items, higher the grade or the test score.

For all satellite students, the correlations between end-of-course grade and Cohesiveness/Goal Direction, teaching partner Support and Study Skill Development were all -.13 and all significant at the .01 level. For conventional students, the Cohesiveness/Goal Direction correlation was -.08 and not significant; the Support correlation was .10 which was significant at the .05 level. But Control and Study Skill Development on the part of conventional teachers had much weaker and not statistically significant relationships to end-of-course grades. The sample for these analyses included 1165 (577 satellite, 588 conventional) students. This particular analysis was not restricted to those students for whom grade point averages were available. The subscale assessing teacher or teaching partner control was not significantly related to end-of-course grade. **Table 34** reports the correlations for satellite and conventional students.

Table 35 indicates that, compared to final grades, there were fewer relationships between test scores and climate variables in either the satellite or conventional treatment groups. This analysis was not restricted to those students for whom grade point averages were available, and included 551 (347 satellite, 204 conventional) students. The only significant correlation for the satellite students was one of -.13 between teaching partner support and test score. No correlations were significant for the conventional students.

Discussion

Figures 15-22, based on the data in **Tables 26-30**, indicate that students perceive relatively few differences between the learning environments of satellite courses in general and conventional courses in general. The same tables and figures also suggest that conventional classes are not always perceived more favorably as learning environments, and satellite classes are qualitatively acceptable substitutes. The differences between subject areas are more striking than the differences between satellite and conventional delivery, particularly at the local level (**Figures 15-22**). **Figure 19** suggests that even students' perceptions of teacher or TV instructor enthusiasm may be strongly influenced by subject area. At the very least, these results suggest that students' evaluations of a particular satellite instructor or local teacher should be interpreted in relation to results typical for that subject area. Method of delivery (satellite or conventional) does not appear to be the major factor in determining students' perceptions of the learning environments.

Although the correlations reported above were statistically significant, they were quite low, and are reported primarily to give future researchers some basis for choosing new avenues of investigation.

Summary and Conclusions From the Four Studies of the Effectiveness of Courses Delivered By Satellite

These four investigations were based upon several different but related definitions or criteria of effectiveness. One criterion of effectiveness is how well satellite students do on standardized subject-matter tests compared to students in conventional classes. Such comparisons were possible in five of the eleven courses satellite courses. There was no significant difference between satellite and conventional students in their performance on standardized subject matter tests in the five subject areas participating in this study.

Another criterion of effectiveness is whether satellite instruction can be effective for the average or below-average student, or if it only benefits students who are high in academic ability and/or motivation. Perhaps **Figures 9 and 10** supply the quickest and most convincing answers to that question. It was undeniably true that students who were highly motivated, interested in their school work, and had good study skills at the beginning of the school year did achieve more than their classmates who were lacking in those qualities (as indicated by **Tables 20 and 21**). However, **Tables 20 and 21** and **Figures 9 and 10** offer little basis for claiming that satellite instruction puts less able, less motivated or less skillful students at a particular disadvantage compared to their opportunities to learn from conventional instruction. The patterns of achievement are parallel and equivalent for students with similar orientations in the two treatments.

The researchers were informed before the studies began that school personnel often restrict enrollment to satellite courses to the "better" students. Cross-tabulations to describe the satellite and conventional student samples indicated that a larger proportion of the satellite students were in the highest achievement categories. So all analyses using achievement as an outcome--whether based on end-of-course grades or standardized test scores--controlled for prior achievement.

Across all courses, satellite students' grades were significantly lower. However, there were also wide differences among courses within the satellite or conventional treatment groups. Even within groupings of similar courses such as all foreign language or all advanced placement courses, there were wide differences in average end-of-course grades. Those differences suggest that lower grades are not an inevitable consequence of satellite delivery, and there may be ways of making the increased challenge or competition less punitive without lowering standards.

A third criterion of effectiveness investigated by the four studies related to students' perceptions of learning environments. Components of perceived learning environment include class cohesiveness; goal direction; teacher support, control, characteristics and skills. **Figures 15-22** indicate relatively few differences in students' perceptions regarding the quality of learning of experience in satellite as compared to conventional courses. Everyone would prefer that these students had an opportunity to take these courses from a qualified teacher who could be with them five days a week, but when that is not possible, apparently the learning environments provided by satellite courses are not consistently better or worse.

The four studies strongly suggested that, by itself, method of delivery (satellite or conventional) has a negligible effects on cognitive or affective outcomes, and that satellite instruction can be equally effective by any of the three definitions. Further discussion and summarizing of these research findings, along with the results of evaluation studies conducted by the Research and Evaluation Center will be found in the concluding chapter of this report.

Table 1
Ethnic/Racial Backgrounds of Students in Satellite Courses Participating in Research Studies

Course	American Indian	Asian or Pacific	African American	Hispanic	White	Other	Row Total
Spanish	0 (0)	2 (.7)	52 (17.1)	4 (1.3)	245 (80.6)	1 (.3)	305 (21.0)
Calculus	0 (0)	0 (0)	14 (32.6)	0 (0)	28 (65.1)	1 (2.3)	43 (3.0)
Trigonometry	0 (0)	0 (0)	8 (16.0)	0 (0)	42 (84.0)	0 (0)	50 (3.5)
Chemistry	0 (0)	0 (0)	0 (0)	0 (0)	34 (100)	0 (0)	34 (2.3)
Physics	4 (3.4)	0 (0)	23 (17.6)	0 (0)	104 (79.4)	0 (0)	131 (9.1)
Applied Economics	0 (0)	0 (0)	1 (1.9)	0 (0)	51 (98.1)	0 (0)	52 (3.6)
Basic English	3 (1.8)	0 (0)	89 (53.0)	9 (5.4)	67 (39.9)	0 (0)	168 (11.6)
German I	15 (3.0)	2 (.4)	29 (5.8)	5 (1.0)	450 (89.3)	3 (.5)	504 (34.8)
German II	2 (2.3)	0 (0)	4 (4.67)	0 (0)	54 (90.0)	0 (0)	60 (4.1)
Russian	1 (2.2)	1 (2.2)	3 (6.7)	1 (2.2)	39 (87.7)	0 (0)	45 (3.1)
Am. Government	0 (0)	1 (1.8)	1 (1.8)	1 (1.8)	53 (94.6)	0 (0)	56 (3.9)
Column Total	**25 (1.7)**	**6 (.4)**	**224 (15.5)**	**20 (1.4)**	**1167 (80.6)**	**5 (.4)**	**1447 (100)**

Table 2
Ethnic/Racial Backgrounds of Students in Conventional Courses Participating in the Research Studies

Course	American Indian	Asian or Pacific	African American	Hispanic	White	Other	Row Total
Spanish	3 (1.5)	0 (0)	99 (49.7)	0 (0)	97 (48.7)	0 (0)	199 (16.8)
Calculus	0 (0)	0 (0)	0 (0)	0 (0)	27 (100)	0 (0)	27 (2.3)
Trigonometry	0 (0)	0 (0)	8 (8.3)	1 (1.0)	87 (90.6)	0 (0)	96 (8.1)
Chemistry	0 (0)	1 (1.9)	16 (13.8)	4 (3.4)	95 (81.9)	0 (0)	116 (9.8)
Physics	0 (0)	0 (0)	0 (0)	0 (0)	20 (100)	0 (0)	116 (9.8)
Applied Economics	4 (1.4)	1 (.4)	56 (20.3)	1 (.4)	213 (77.2)	1 (.4)	276 (23.2)
Basic English	7 (4.2	1 (.6)	12 (7.3)	0 (0)	144 (87.3)	0 (0)	8 (.7)
German I	4 (11.4)	0 (0)	0 (0)	0 (0)	31 (88.6)	1 (.6)	165 (13.9)
German II	0 (0)	0 (0)	0 (0)	0 (0)	8 (100)	0 (0)	8 (.7)
Russian	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Am. Government	0 (0)	2 (.8)	38 (15.5)	2 (.8)	203 (82.9)	0 (0)	245 (20.6)
Column Total	**18 (1.5)**	**5 (.4)**	**229 (19.3)**	**8 (.7)**	**925 (77.9)**	**2 (.2)**	**1187 (100)**

Table 3

Number and Percent of Students Viewing the Satellite Course Live, on Tape, or a Combination of Live and Taped Viewing

	Number (Percent) Viewing Per Course			
Course	Live	Taped	Both	**Row Total**
Spanish	180 (59.2)	124 (40.8)	0 (0)	**304 (20.8)**
AP Calculus	43 (100)	0 (0)	0 (0)	**43 (2.9)**
Trigonometry	39 (78.0)	11 (22.0)	0 (0)	**50 (3.4)**
AP Chemistry	29 (85.3)	5 (14.7)	0 (0)	**34 (2.3)**
AP Physics	112 (69.2)	30 (18.5)	20 (12.3)	**162 (11.1)**
Applied Economics	16 (30.8)	23 (44.2)	13 (25.0)	**52 (3.5)**
Basic English & Reading	64 (37.9)	82 (48.5)	23 (13.6)	**169 (11.6)**
German I	271 (53.7)	214 (42.5)	19 (3.8)	**504 (34.5)**
German II	17 (18.1)	43 (45.7)	34 (36.2)	**94 (6.4)**
Russian	28 (62.2)	17 (37.7)	0 (0)	**45 (3.1)**
AP American Government	29 (51.7)	27 (48.2)	0 (0)	**55 (3.8)**
Column Total	**828 (56.7)**	**576 (34.5)**	**55 (3.8)**	**1459 (100)**

Table 4
Percent of Students In Satellite and Conventional Courses From Homes Where English Is the Only Language

Course	Percent of Students Satellite	Conventional
Spanish	97.4	95.5
AP Calculus	95.3	90.3
Trigonometry	96	100
AP Chemistry	97.1	100
AP Physics	96.5	100
Applied Economics	94.2	97.8
Basic English & Reading	89.7	95.1
German I	96.3	97.5
German II	100	100
Russian	95.6	0
AP American Government	94.6	98.4

Table 5
Self-Reported Typical Grades
By Students In Each Intervention

	Number (Percent) Per Level					
	Mostly A or B+	Mostly B or B+	Mostly C or C+	Mostly C or D	Mostly D or F	**Row Totals**
Satellite	848 (58.4)	364 (25.1)	174 (12.0)	43 (3.0)	22 (1.5)	**1451 (53.4)**
Conventional	466 (36.8)	363 (28.7)	310 (24.5)	101 (8.0)	25 (2.0)	**1265 (46.6)**
Column Totals	**1314 (48.4)**	**727 (26.8)**	**464 (17.8)**	**144 (5.3)**	**47 (1.7)**	**2716 (100)**

Table 6
Self-Reported Class Rank
By Students In Each Intervention

	Number (Percent) Per Level					
	Among Best	Above Average	Average	Below Average	Among Poorest	**Row Totals**
Satellite	571 (39.4)	417 (28.8)	410 (28.3)	36 (2.5)	16 (1.1)	**1450 (53.4)**
Conventional	298 (23.6)	317 (25.1)	549 (43.4)	90 (7.1)	11 (.9)	**1265 (46.6)**
Column Totals	**869 (32.0)**	**734 (27.0)**	**959 (35.4)**	**126 (4.6)**	**27 (1.0)**	**2715 (100)**

Table 7
Number and Percent of Students Taking the Course for Each Type of Reason

	Number (Percent) Per Reason					
	Interest	Prepare	No Other	External	Other	Row Total
Satellite	347 (23.8)	657 (45.0)	75 (5.1)	203 (13.9)	179 (12.3)	1461 (53.6)
Conventional	115 (9.1)	472 (37.4)	59 (4.7)	535 (42.4)	82 (6.5)	1263 (46.4)
Column Total	462 (17.0)	1129 (41.4)	134 (4.9)	738 (27.1)	261 (9.6)	

Table 8
Who Influenced You to Take This Course? Number and Percent of Students in Each Category

	Number (Percent)					
	Own Decision	Family	Administrator or Counselor	Teacher	Student	Row Total
Satellite	850 (58.1)	79 (5.4)	342 (23.4)	134 (9.2)	57 (3.9)	1462 (53.6)
Conventional	586 (46.4)	43 (3.4)	542 (42.9)	52 (4.1)	41 (3.2)	1264 (46.4)
Column Total	1436 (52.7)	122 (4.5)	884 (32.4)	186 (6.8)	98 (3.6)	2726 (100)

Table 9

Attribution When Students Do Well: Percent of Satellite and the Percent of Conventional Students Who Chose Each Type of Attribution

	Worked hard	Good in Subject	Easy Course	Lucky	Other
Satellite	44.6	40.1	9.2	5.7	0.3
Conventional	42.9	36.4	13.2	7.2	0.2

Table 10

Attribution When Students Do Poorly: Percent of Satellite and Percent of Conventional Students Who Chose Each Type of Attribution

	Didn't Work Hard	Not Good in Subject	Hard Course	Not Lucky	Other
Satellite	48.3	19.7	28.9	2.7	0.3
Conventional	47.2	20.4	30	2.3	0.2

Table 11

Percent of Satellite and Percent of Conventional Students Who Agree Luck Is More Important Than Hard Work for Success

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Satellite	2.7	4	13.3	41.8	38.3
Conventional	1.3	3.7	12	47.4	35.5

Table 12
Grades Obtained by Students in Each Treatment Whose Fathers Attained Each Level of Education, Controlling for Students' Prior Achievement (Grades Converted to Standard Scores)

Educational Level Attained by Fathers
Z Score, Followed By Number of Students in Each Group

End-of-Course Grades For	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Students in Satellite Classes	-.21 (22)	-.27 (69)	.02 (169)	-.18 (71)	.16 (145)	-.02 (476)
Students in Conventional Classes	-.05 (16)	-.07 (42)	.07 (142)	.29 (34)	.50 (65)	.17 (299)
Column Average (Total)	-.10 (38)	-.20 (111)	.04 (311)	-.03 (105)	.27 (210)	.05 (775)

Note: End-of-course grades for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z scores for students whose fathers attained each level of education, and the mean Z scores for treatment by fathers' educational levels are shown.

Table 13
Grades Obtained by Students in Each Treatment Whose Mothers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Grades Converted to Standard Scores)

	Educational Level Attained by Mothers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
End-of-Course Grades For						
Students in Satellite Classes	-.14 (9)	-.38 (75)	-.05 (195)	.08 (65)	.18 (133)	-.02 (477)
Students in Conventional Classes	.12 (8)	-.18 (38)	.01 (143)	.28 (53)	.60 (65)	.16 (307)
Column Average (Total)	-.02 (17)	-.32 (113)	-.03 (338)	.17 (118)	.32 (198)	.05 (784)

Note: End-of-course grades for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z scores for students whose mothers attained each level of education, and the mean Z scores for treatment by mothers' educational levels are shown.

Table 14
Achievement Test Scores Obtained by Students in Each Treatment Whose Fathers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Test Scores Converted to Standard Scores)

	Educational Level Attained by Fathers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Achievement Test Scores For						
Students in Satellite Classes	.53 (11)	-.22 (38)	.12 (118)	.26 (45)	.12 (85)	.11 (297)
Students in Conventional Classes	-.49 (16)	-.16 (44)	-.02 (100)	-.08 (31)	.04 (53)	-.14 (244)
Column Average (Total)	-.08 (27)	-.19 (82)	-.03 (218)	.12 (76)	.09 (138)	.00 (541)

Note: Subject area achievement test scores for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z scores for students whose fathers attained each level of education, and the mean Z scores for treatment by fathers' educational levels are shown.

Table 15

Achievement Test Scores Obtained by Students in Each Treatment Whose Mothers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Test Scores Converted to Standard Scores)

	Educational Level Attained by Mothers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Achievement Test Scores For						
Students in Satellite Classes	-.19 (7)	.04 (33)	.16 (133)	.16 (133)	.05 (83)	.12 (297)
Students in Conventional Classes	-.18 (7)	-.37 (57)	-.10 (96)	-.10 (96)	.10 (48)	-.14 (245)
Column Average (Total)	-.18 (14)	-.22 (90)	.05 (229)	.03 (78)	.07 (131)	.00 (542)

Note: Subject area achievement test scores for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatments, the mean Z scores for students whose mothers attained each level of education, and the mean Z scores by treatment by mothers' educational levels are shown.

Table 16

Grades Obtained by Satellite Students Who Interacted at Different Levels and Whose Fathers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Grades Converted to Standard Scores)

	Educational Level Attained by Fathers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Grades For Students Who						
Never Called	-.83 (6)	-.40 (20)	-.08 (59)	-.36 (18)	-.17 (45)	-.22 (148)
Called 1-5 Times	-.10 (10)	-.14 (26)	.12 (55)	-.07 (25)	.16 (52)	.05 (168)
Called 6-10 Times	1.01 (1)	-.69 (4)	-.33 (10)	-1.26 (3)	.34 (7)	-.25 (25)
More Than 10 Times	1.34 (1)	-.58 (1)	.48 (11)	.28 (2)	.60 (10)	.50 (25)
Column Average (Total)	-.20 (18)	-.30 (51)	.03 (135)	-.23 (48)	.08 (114)	-.05 (366)

Note: End-of-course grades for satellite students were converted to standard scores. Within that sample, the mean Z scores for students whose fathers attained each level of education, the mean Z scores for students who interacted at each level of frequency, and the mean Z scores for students whose fathers attained each level of education by students' level of interaction are shown.

Table 17

Grades Obtained by Satellite Students Who Interacted at Different Levels and Whose Mothers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Grades Converted to Standard Scores)

	Educational Level Attained by Mothers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Grades For Students Who						
Never Called	-.76 (3)	-.52 (27)	-.38 (54)	.18 (21)	-.05 (43)	-.24 (148)
Called 1-5 Times	.06 (5)	-.40 (24)	.02 (71)	.14 (20)	29 (49)	.05 (169)
Called 6-10 Times	.00 (0)	-.96 (3)	-.02 (10)	-.90 (4)	.04 (8)	-.25 (25)
More Than 10 Times	.73 (1)	.00 (0)	.48 (11)	.84 (6)	.22 (7)	.50 (25)
Column Average (Total)	-.14 (9)	-.49 (54)	-.09 (146)	.16 (51)	.13 (107)	-.05 (367)

Note: End-of-course grades for satellite students were converted to standard scores. Within that sample, the mean Z scores for students whose mothers attained each level of education, the mean Z scores for students who interacted at each level of frequency, and the mean Z scores for students whose mothers attained each level of education by students' level of interaction are shown.

Table 18
Achievement Test Scores Obtained by Satellite Students Who Interacted at Different Levels and Whose Fathers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Scores Converted to Standard Scores)

	Educational Level Attained by Fathers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Scores For Students Who						
Never Called	.52 (3)	-.07 (14)	-.03 (45)	.23 (16)	.28 (33)	.11 (111)
Called 1-5 Times	.16 (6)	-.17 (12)	.10 (41)	.28 (14)	.01 (30)	.07 (103)
Called 6-10 Times	.81 (1)	-.71 (3)	.64 (7)	.31 (2)	-.37 (4)	.14 (17)
More Than 10 Times	2.50 (1)	.00 (0)	.46 (6)	.61 (2)	.89 (6)	.79 (15)
Column Average (Total)	.53 (11)	-.17 (29)	.10 (99)	.28 (34)	.18 (73)	.14 (246)

Note: Subject-area achievement test scores for satellite students were converted to standard scores. Within that sample, the mean Z scores for students whose fathers attained each level of education, the mean Z scores for students who interacted at each level of frequency, and the mean Z scores for students whose fathers attained each level of education by students' level of interaction are shown.

Table 19
Achievement Test Scores Obtained by Satellite Students Who Interacted at Different Levels and Whose Mothers Attained Various Levels of Education, Controlling for Students' Prior Achievement (Scores Converted to Standard Scores)

	Educational Level Attained by Mothers Z Score, Followed By Number of Students in Each Group					
	Eighth Grade	Some H.S.	H.S. Graduate	Some College	College Graduate	Row Average (Total)
Scores For Students Who						
Never Called	-1.03 (2)	.06 (17)	.10 (45)	.12 (13)	.23 (33)	.11 (110)
Called 1-5 Times	-.20 (4)	.22 (6)	.11 (51)	.27 (11)	.00 (32)	.09 (104)
Called 6-10 Times	.00 (0)	-.24 (2)	.48 (9)	-.02 (3)	-.50 (3)	.14 (17)
More Than 10 Times	1.53 (1)	.00 (0)	.75 (6)	1.11 (5)	.07 (3)	.79 (15)
Column Average (Total)	-.15 (7)	.08 (25)	.17 (111)	.31 (32)	.09 (71)	.14 (246)

Note: Subject-area achievement test scores for satellite students were converted to standard scores. Within that sample, the mean Z scores for students whose mothers attained each level of education, the mean Z scores for students who interacted at each level of frequency, and the mean Z scores for students whose mothers attained each level of education by students' level of interaction are shown.

Table 20
Mean End-of-Course Grade and Number of Students
For Each Orientation to Studying Group
(Grades Converted to Standard Scores)

Orientation to Studying
Z Score, Followed by Number of Students in Each Group

	Meaning-Oriented Score (Number)	Strategic Score (Number)	Reproducing Score (Number)	Non-Academic Score (Number)	Row Average (Total)
Satellite	.05 (202)	.22 (132)	-.26 (100)	-.69 (28)	-.02 (462)
Conventional	.22 (103)	.42 (79)	.08 (77)	-.54 (36)	.15 (295)
Column Average (Total)	.11 (305)	.29 (211)	-.11 (177)	-.61 (64)	.05 (757)

Note: End-of-course grades for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z scores for students in each Orientation to Studying, and the mean Z scores for treatment by orientation are shown.

Table 21
Mean Test Score and Number of Students
For Each Orientation to Studying Group
(Grades Converted to Standard Scores)

	Orientation to Studying Z Score, Followed by Number of Students in Each Group				
	Meaning-Oriented Score (Number)	Strategic Score (Number)	Reproducing Score (Number)	Non-Academic Score (Number)	Row Average Average (Total)
Satellite	.22 (112)	.31(85)	-.30 (68)	.07 (23)	.11 (288)
Conventional	.00 (89)	-.02 (60)	-.33 (73)	-.31 (18)	-.13 (250)
Column Average (Total)	.13 (201)	.17 (145)	-.32 (141)	-.10 (41)	.00 (528)

Note: Subject-matter achievement test scores for students in all courses and both satellite and conventional treatments were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z scores for students Orientation to Studying, and the mean Z scores for treatment by orientation are shown.

Table 22
Mean End-of-Course Grade
For Students In Each Course,
(Grades Converted to Standard Scores)

Courses #1 to #9
Mean Z Score, Followed by Number of Students
in Parenthesis

	#1	#2	#4	#5	#6	#7	#8	#9	Row Average (Total)
Satellite	-.01 (52)	-.08 (13)	-.03 (234)	.95 (12)	-.30 (38)	.01 (31)	-.05 (29)	-.08 (39)	-.03 (448)
Conventional	.10 (96)	.17 (33)	.05 (41)	-.09 (22)	.72 (16)	.25 (24)	.24 (47)	.03 (17)	.15 (296)
Column Average (Total)	.06 (148)	.10 (46)	-.02 (275)	.28 (34)	.00 (54)	.12 (55)	.13 (76)	-.05 (56)	.04 (744)

Notes: End-of-course grades for students in all courses and in both satellite and conventional treatment groups were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z score for students in each course, and the mean Z score for treatment by course are shown.

Table 23
Mean Achievement Test Scores For Students In Each Course, Converted to Standard Scores

Courses #1 to #5
Mean Z Score Followed by Number of Students in Parenthesis

	#1	#2	#3	#4	#5	Row Average (Total)
Satellite	.06 (71)	.11 (81)	-.74 (2)	.01 (118)	.78 (28)	.11 (300)
Conventional	-.01 (17)	-.26 (37)	-.27 (7)	.43 (28)	-.47 (41)	-.15 (130)
Column Average (Total)	.04 (88)	-.01 (118)	-.37 (9)	.08 (146)	.03 (69)	.03 (430)

Note: Achievement test scores for students in all courses and in both satellite and conventional treatment groups were converted to standard scores. Within that sample, the mean Z scores for students in each treatment, the mean Z score for students in each course, and the mean Z score for treatment by course are shown.

Table 24
Mean Class End-of-Course Grade
For Classes In Each Course,
Grades Converted to Standard Scores

Courses #1 to #9
Mean Class Z Score, Followed by Number of Classes
in Parenthesis

	#1	#2	#4	#5	#6	#7	#8	#9	Row Average (Total)
Satellite	.29 (6)	.12 (1)	.01 (27)	.47 (4)	-.02 (7)	-.25 (5)	-.09 (6)	.06 (5)	.04 (61)
Conventional	-.26 (5)	-.25 (3)	.10 (3)	-.69 (2)	.10 (1)	.86 (3)	.39 (4)	-.28 (2)	.03 (23)
Column Average (Total)	.04 (11)	-.16 (4)	.01 (30)	.08 (6)	.00 (8)	.17 (8)	.10 (10)	-.03 (7)	.03 (84)

Note: Mean end-of-course grades for classes in all courses and in both satellite and conventional treatment groups were converted to standard scores. Within that sample, the mean Z scores for classes in each treatment, the mean Z scores for classes in each course, and the mean Z scores for treatment by course are shown.

Table 25
Mean Achievement Test Score
For Classes In Each Course,
Test Scores Converted to Standard Scores

Courses #1 to #9
Mean Z Score, Followed by Number of Classes
in Parenthesis

	#1	#2	#3	#4	#5	Row Average (Total)
Satellite	.25 (7)	.04 (11)	-.59 (1)	-.06 (16)	.71 (6)	.12 (41)
Conventional	-.33 (2)	.01 (4)	-.22 (2)	.57 (2)	-.96 (4)	-.27 (14)
Column Average (Total)	.12 (9)	.03 (15)	-.34 (3)	.01 (18)	.04 (10)	.02 (55)

Notes: Mean achievement test scores for classes in all courses and in both satellite and conventional treatment groups were converted to standard scores. Within that sample, the mean Z scores for classes in each treatment, the mean Z scores for classes in each course, and the mean Z score for treatment by course are shown.

Means on Subscales Assessing Classroom Climate or Teaching Characteristics

Table 26
Individual Students' Perceptions of the Cohesiveness or Goal-Direction of the Class

	Courses											
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	1.90	2.21	2.11	1.58	2.06	2.06	1.97	2.04	1.91	2.15	1.86	2.02
Conventional	1.86	2.01	1.72	1.46	1.77	1.77	2.27	1.82	1.98	1.67		1.86
Column Average	**1.88**	**2.07**	**1.75**	**1.55**	**1.90**	**2.03**	**2.01**	**2.01**	**1.92**	**1.86**	**1.86**	1.94

Table 27
Individual Students' Perceptions of the Supportiveness of the Teacher or Teaching Partner

	Courses											
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	1.87	2.11	2.22	1.40	1.94	1.97	2.05	2.08	1.92	2.33	1.85	2.03
Conventional	2.00	2.05	1.77	1.48	2.00	2.27	2.00	1.97	2.11	1.62		1.92
Column Average	**1.96**	**2.07**	**1.80**	**1.42**	**1.98**	**2.03**	**2.02**	**2.07**	**1.95**	**2.24**	**1.85**	1.97

Table 28
Individual Students' Perceptions of the Degree to Which The Teacher or Teaching Partner Controlled the Class

	Course											
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	2.37	2.31	2.00	1.82	2.12	1.97	2.16	2.16	2.10	2.10	1.67	2.08
Conventional	2.16	2.09	2.01	1.81	1.72	2.08	1.94	1.94	2.06	2.58		2.01
Column Average	2.23	**2.16**	**2.01**	**1.82**	**1.89**	**1.99**	**2.03**	**2.10**	**2.18**	**2.10**	1.67	2.04

Means on Subscales Assessing Classroom Climate or Teaching Characteristics

Table 31
Individual Students' Perceptions of the Organizing Skills of the Teacher or TV Instructor

Courses

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	2.51	2.58	2.24	2.42	2.34	2.21	2.15	2.32	2.27	2.45	2.49	2.31
Conventional	1.97	2.00	1.77	1.69	1.80	2.16	1.95	1.84	2.00	1.67		1.88
Column Average	**2.15**	**2.18**	**1.80**	**2.24**	**2.04**	**2.20**	**2.03**	**2.27**	**2.22**	**2.35**	**2.49**	**2.10**

Table 32
Individual Students' Perceptions of the Relating or Explaining Skills of the Teacher or TV Instructor

Courses

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	2.47	2.36	2.24	2.34	2.23	2.19	2.16	2.23	2.16	2.55	2.61	2.27
Conventional	2.13	2.01	1.72	1.65	1.97	2.30	2.05	2.04	1.98	1.72		1.92
Column Average	**2.24**	**2.12**	**1.75**	**2.17**	**2.08**	**2.22**	**2.09**	**2.21**	**2.13**	**2.44**	**2.61**	**2.10**

Table 33
Individual Students' Perceptions of the Simplifying Skills of the Teacher or TV Instructor

Course

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Row Average
Satellite	2.64	2.43	2.43	2.44	2.47	2.28	2.26	2.35	2.34	2.54	2.66	2.37
Conventional	2.18	2.19	1.94	2.02	2.13	2.45	2.07	2.09	2.16	2.03		2.07
Column Average	**2.34**	**2.27**	**1.97**	**2.33**	**2.28**	**2.32**	**2.14**	**2.32**	**2.31**	**2.48**	**2.66**	**2.23**

Table 34
Correlations Between Students' Individual Perceptions of Class Climate in All Courses And Their End-of-Course Grades Converted to Standard or Z Scores

	Satellite	Conventional
Cohesiveness/Goal Direction	**-0.13**	-0.08
Support	**-0.13**	**-0.13**
Control	-0.03	-0.01
Study Skill Development	**-0.13**	-0.05

Table 35
Correlations Between Students' Individual Perceptions of Class Climate in All Courses and Their Test Scores Converted to Standard or Z Scores

	Satellite	Conventional
Cohesiveness/Goal Direction	-0.06	-0.09
Support	**-0.13**	-0.01
Control	0.01	0.08
Study Skill Development	-0.0[illegible]	-0.02

Bold face type indicates correlation was significant at the .05 level.

Table 36

Correlations Between Students' Individual Perceptions of Class Climate In All Courses And Their End-of-Course Grades Converted to Standard or Z Scores

	Satellite	Conventional
Cohesiveness/Goal Direction	**-0.13**	-0.08
Support	**-0.13**	**-0.13**
Control	-0.03	-0.01
Study Skill Development	**-0.13**	-0.05

Table 37

Correlations Between Students' Individual Perceptions of Class Climate In All Courses and Their Test Scores Converted to Standard or Z Scores

	Satellite	Conventional
Cohesiveness/Goal Direction	-0.06	-0.09
Support	**-0.13**	-0.01
Control	0.01	0.08
Study Skill Development	-0.06	-0.02

Bold face type indicates correlation was significant at the .05 level.

Figure 1
Grades Obtained by Students in Each Treatment Group Whose Fathers Attained Each Level of Education, Grades Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score shown on Table 12.

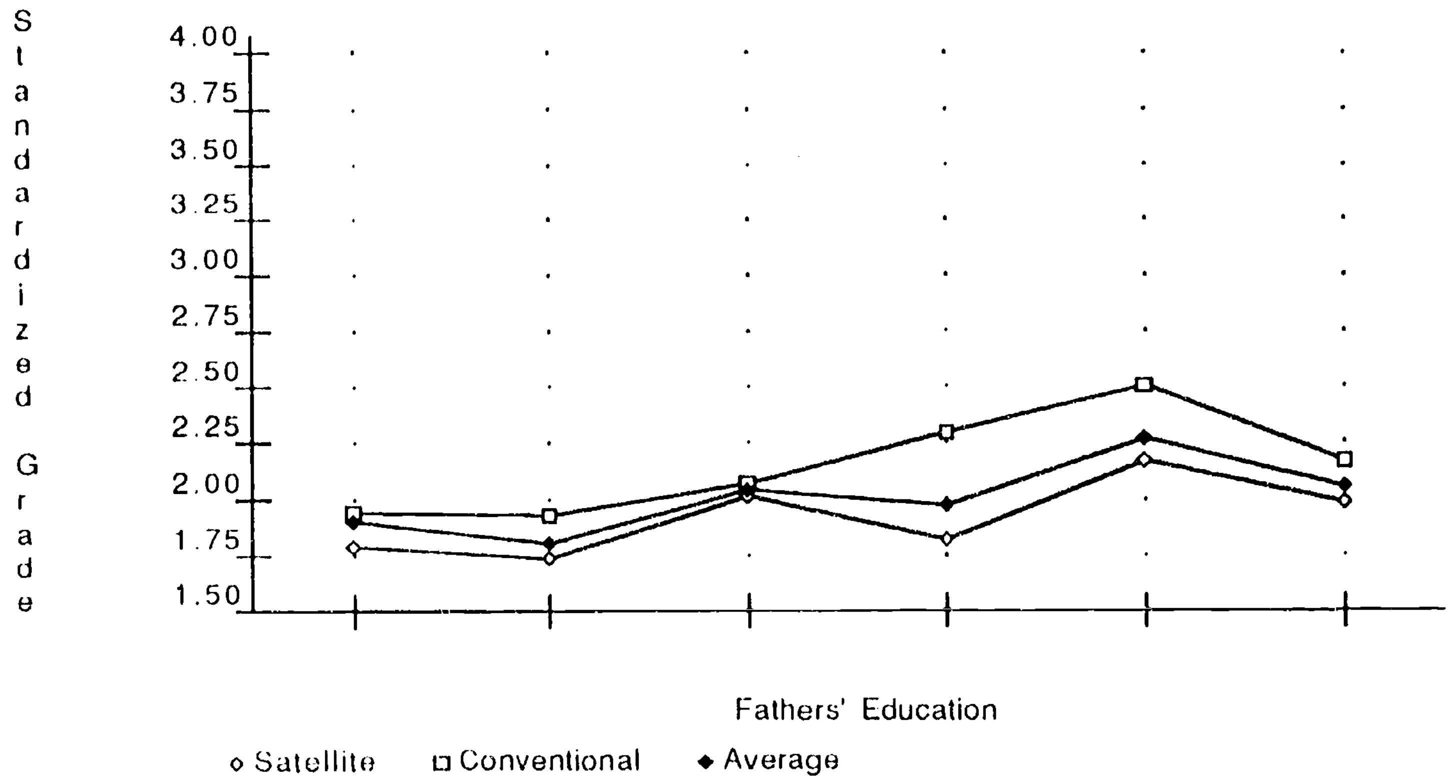


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Figure 2
Grades Obtained by Students in Each Treatment Group Whose Mothers Attained Each Level of Education, Grades Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score shown on Table 13.

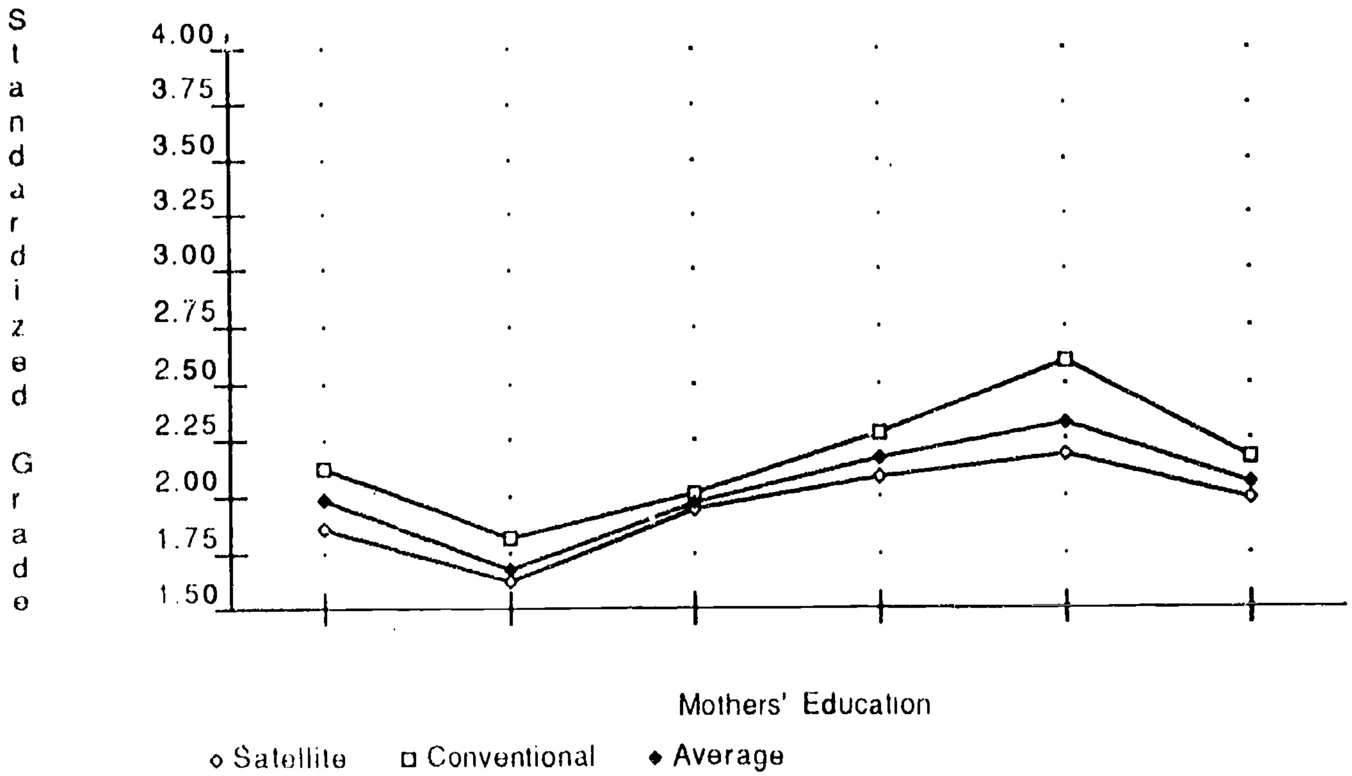

Figure 3
Achievement Test Scores Obtained by Students in Each Treatment Group
Whose Fathers Attained Each Level of Education,
Test Scores Converted to Standard Scores*

Column 1	=	Eighth grade
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score shown on Table 14.

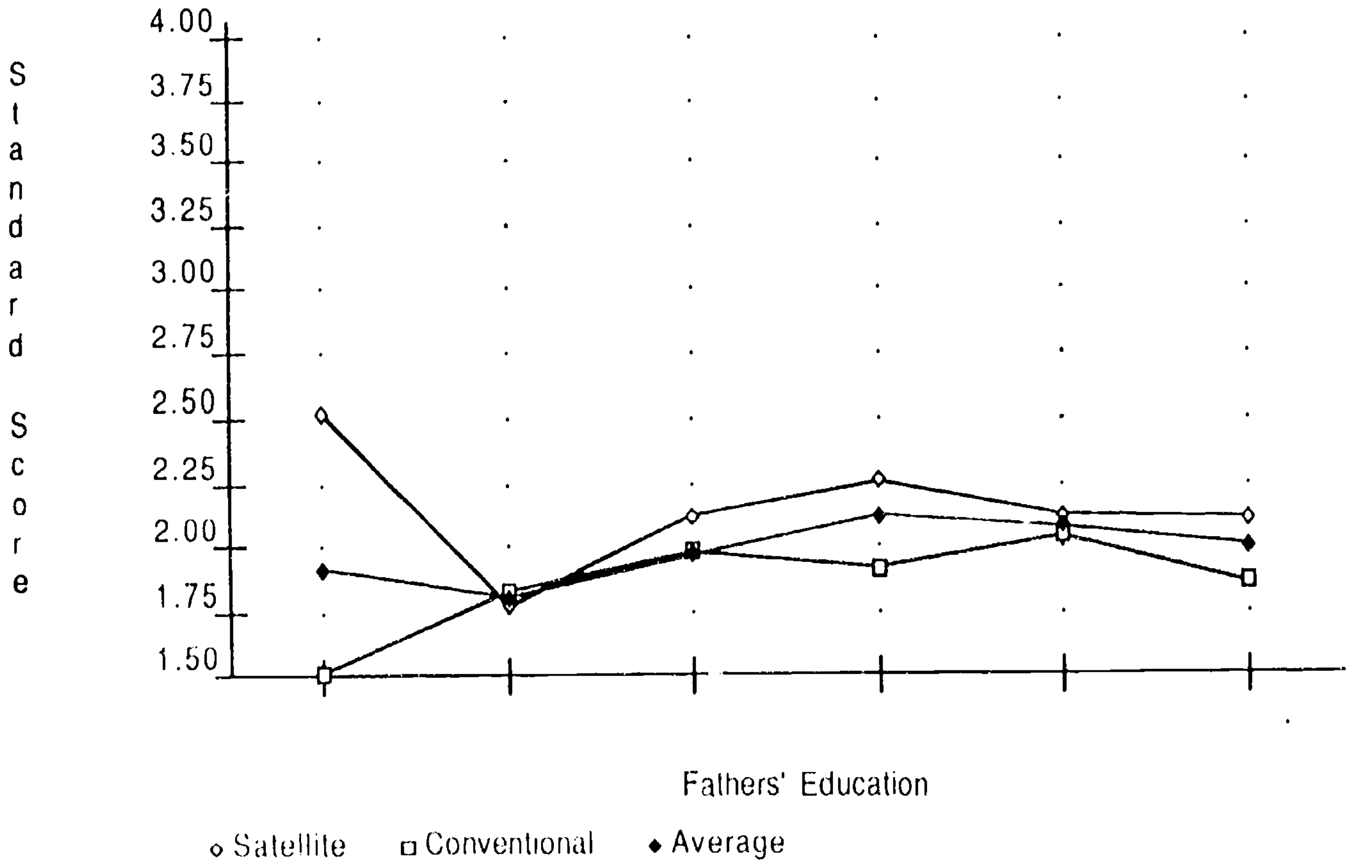

Figure 4
Achievement Test Scores Obtained by Students in Each Treatment Group
Whose Mothers Attained Each Level of Education,
Test Scores Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant 2.00 was added to each standard score shown on Table 15.

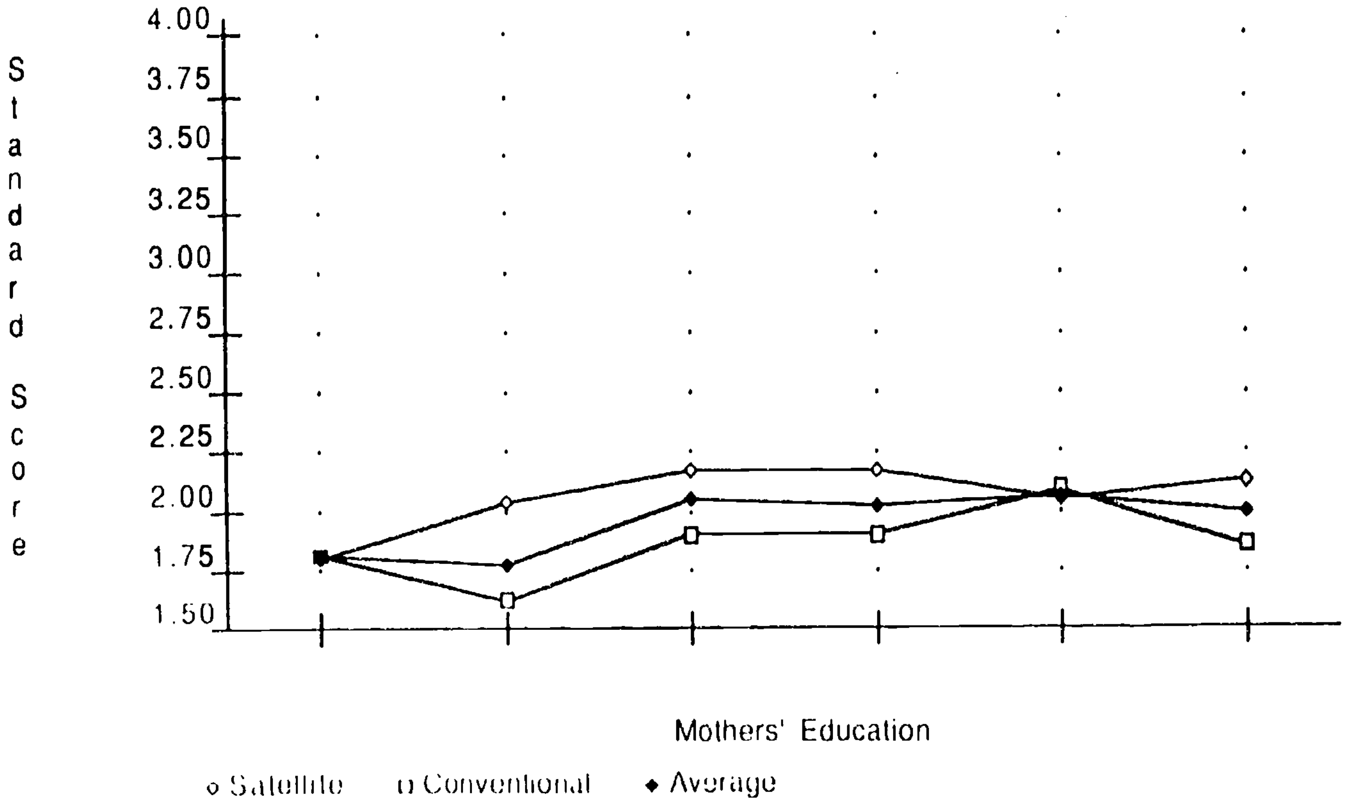

Figure 5
Grades Obtained by Satellite Students Who Interacted at Different Levels and Whose Fathers Attained Each Level of Education, Grades Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score shown on Table 16.

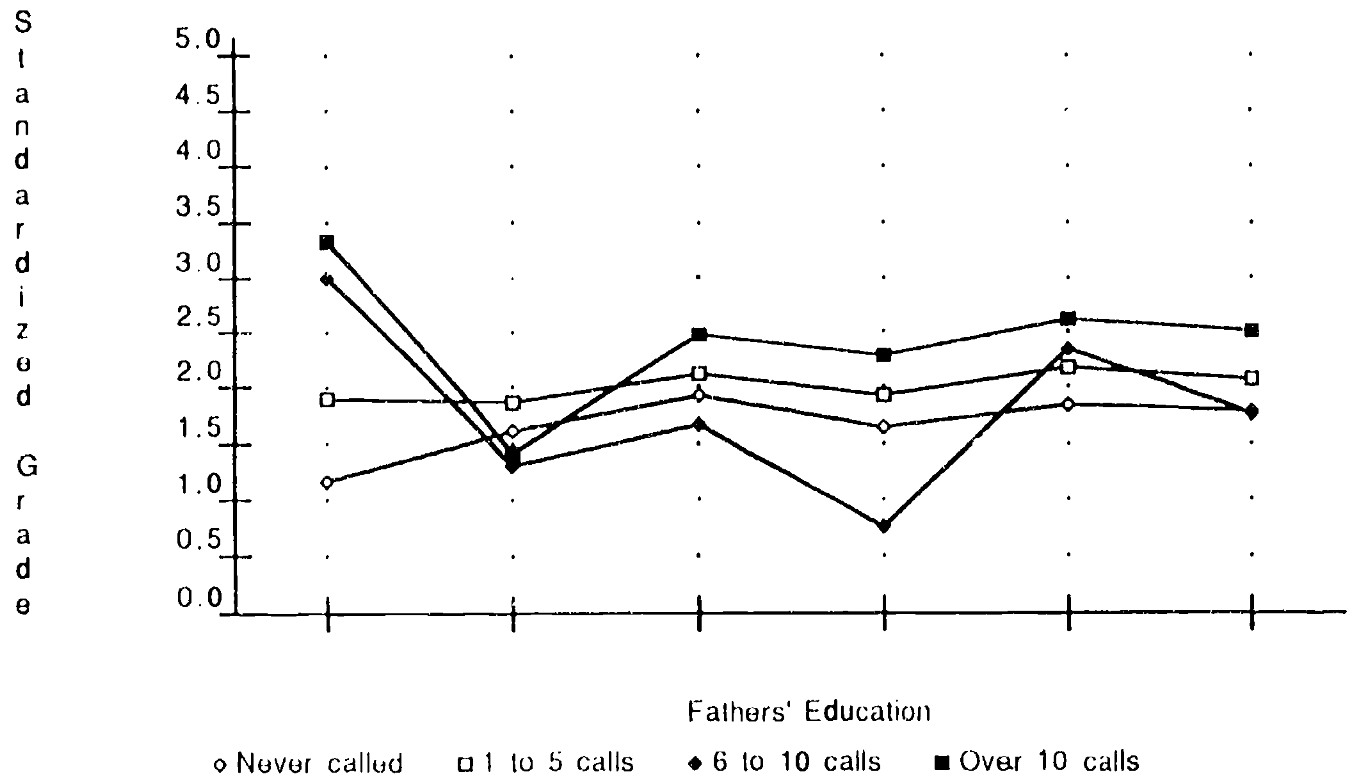

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Figure 6
Grades Obtained by Satellite Students Who Interacted at Different Levels and Whose Mothers Attained Each Level of Education, Grades Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 17.

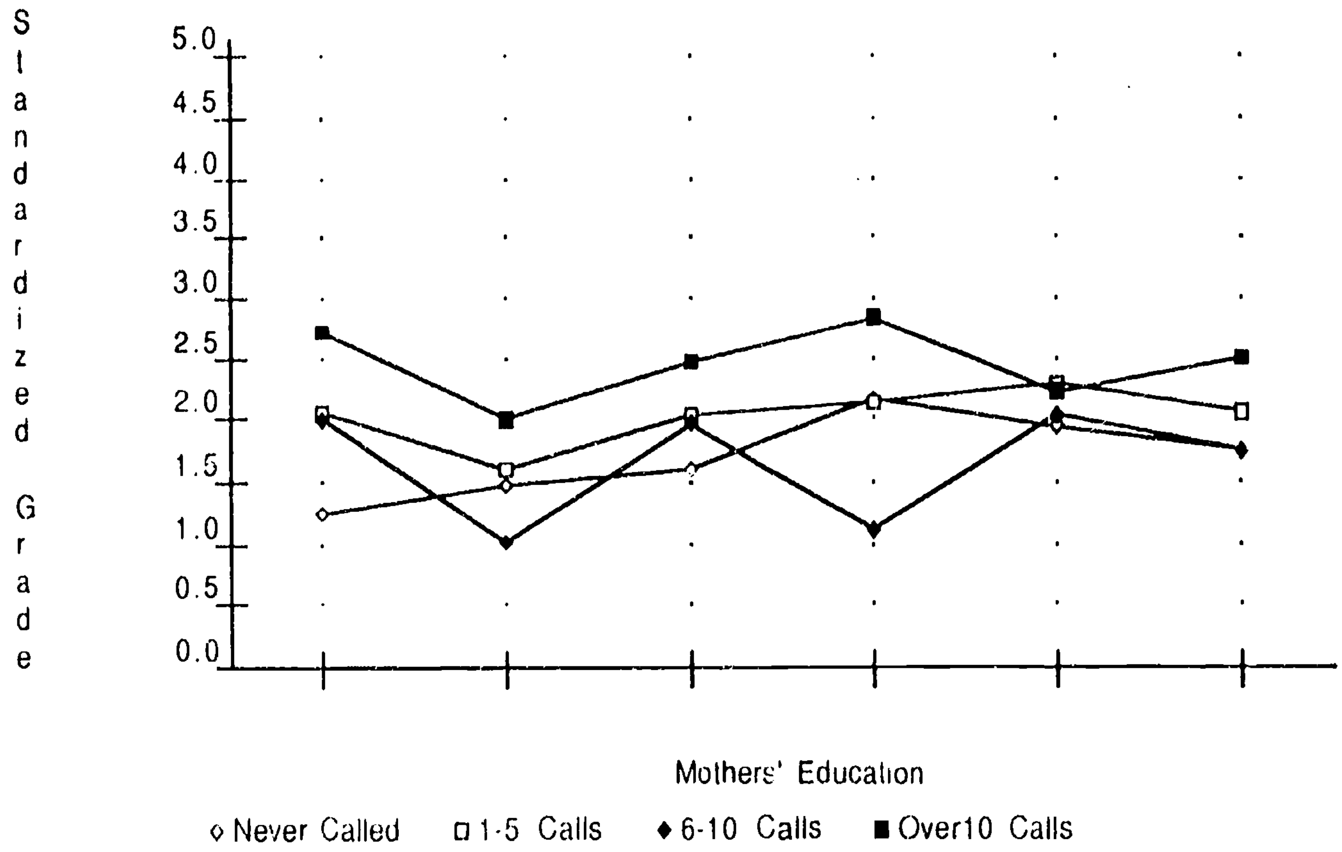


Figure 7
Achievement Test Scores Obtained by Satellite Students Who Interacted at Different Levels and Whose Fathers Attained Each Level of Education, Test Scores Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 18.

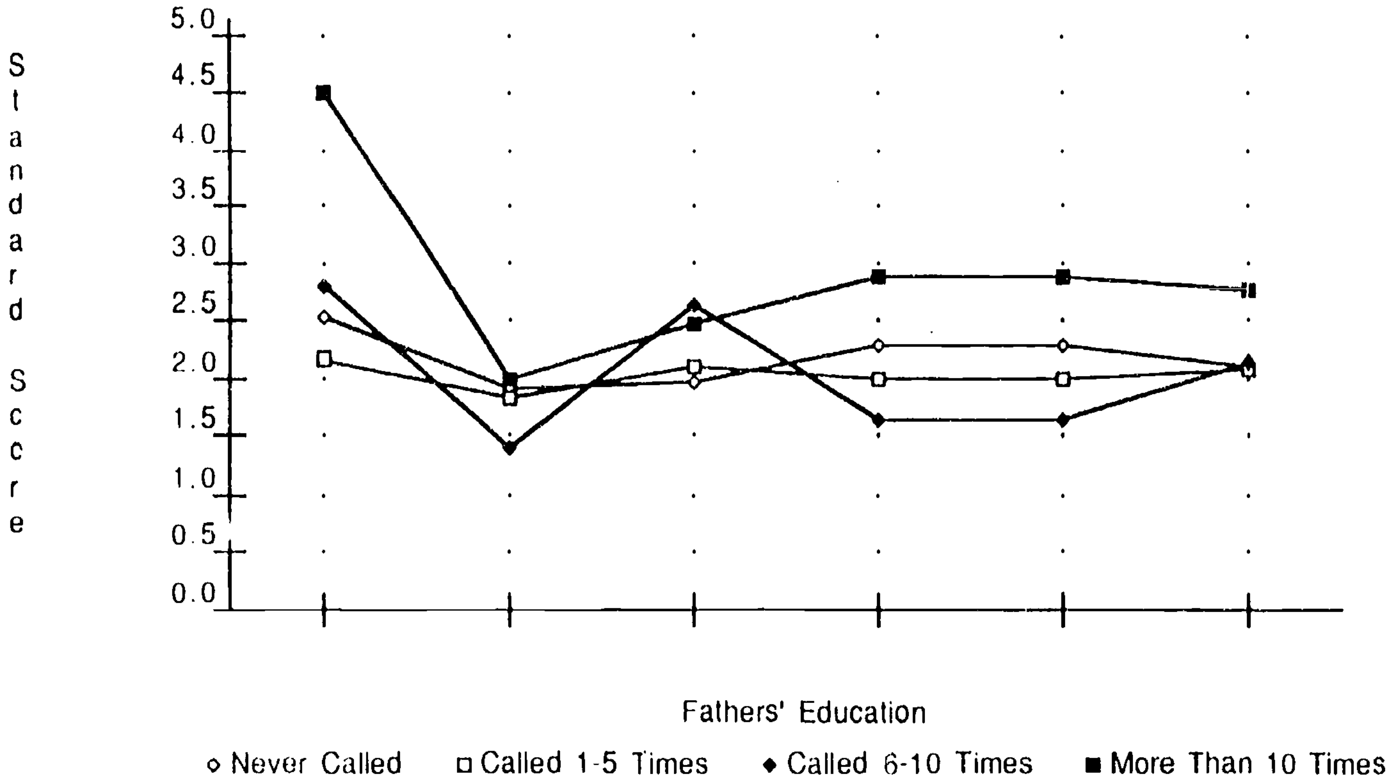


Figure 8
Achievement Test Scores Obtained by Satellite Students Who Interacted at Different Levels and Whose Mothers Attained Each Level of Education, Test Scores Converted to Standard Scores*

Column 1	=	Eighth grade or less
Column 2	=	Started high school
Column 3	=	High school graduate
Column 4	=	Started college
Column 5	=	College graduate
Column 6	=	Average for all education levels

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 19.

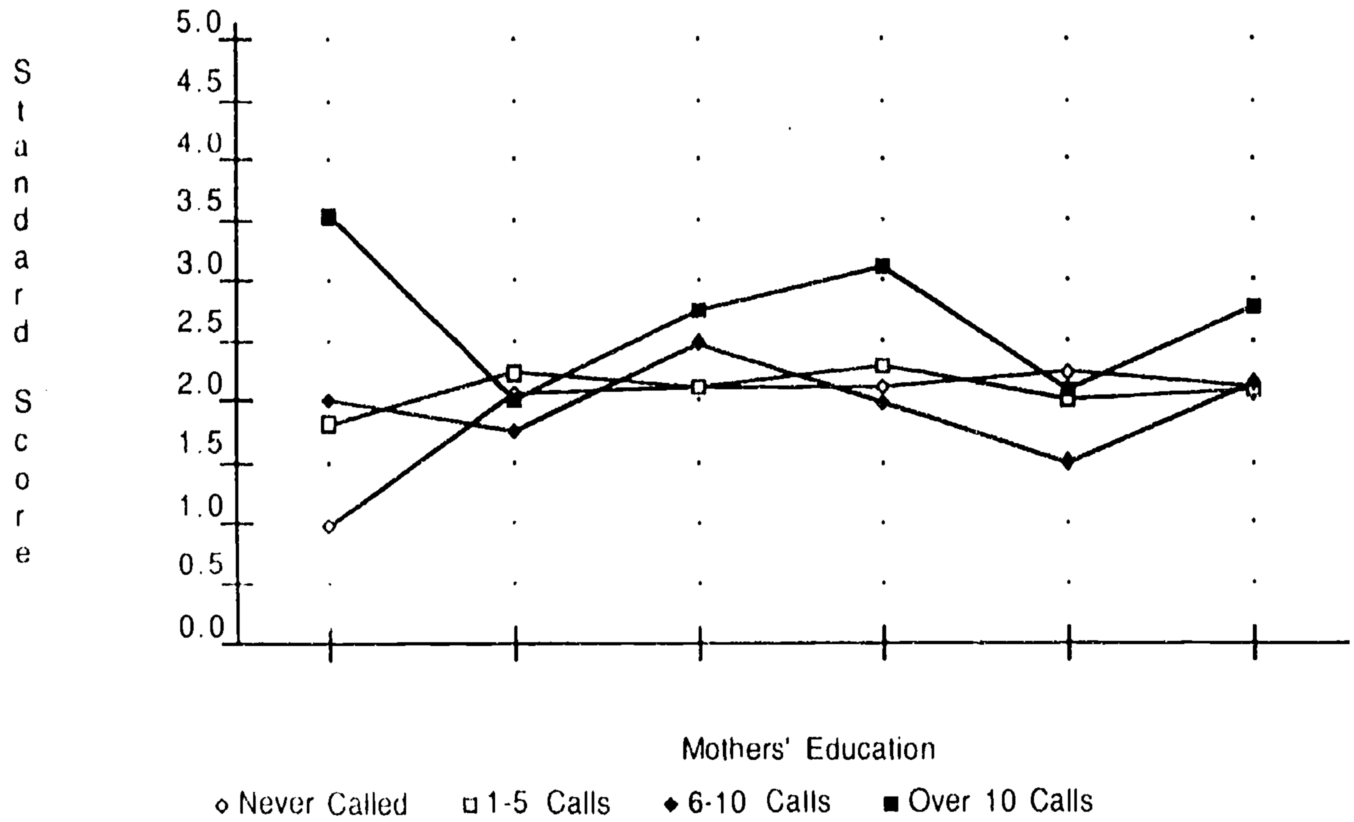


Figure 9
Grades Obtained by Students in Each Treatment Group and
With Each Orientation to Studying, Grades Converted to Standard Scores*

Column 1	=	Meaning Orientation
Column 2	=	Strategic Orientation
Column 3	=	Reproducing Orientation
Column 4	=	Non-Academic Orientation
Column 5	=	Average

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 20.

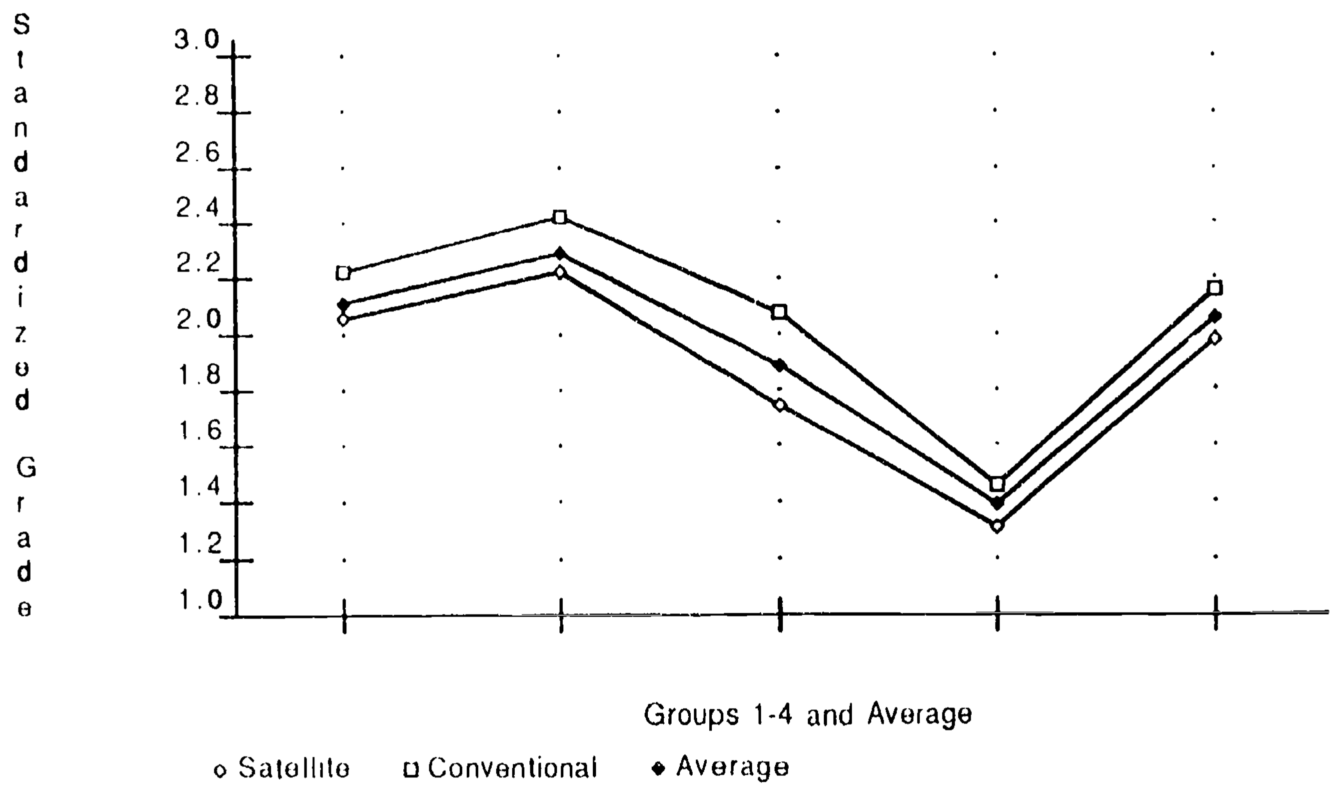


Figure 10
Test Scores Obtained by Students in Each Treatment Group and
With Each Orientation to Studying, Test Scores Converted to Standard Scores*

Column 1	=	Meaning Orientation
Column 2	=	Strategic Orientation
Column 3	=	Reproducing Orientation
Column 4	=	Non-Academic Orientation
Column 5	=	Average

*For graphing purposes, a constant was added to each standard score on Table 21.

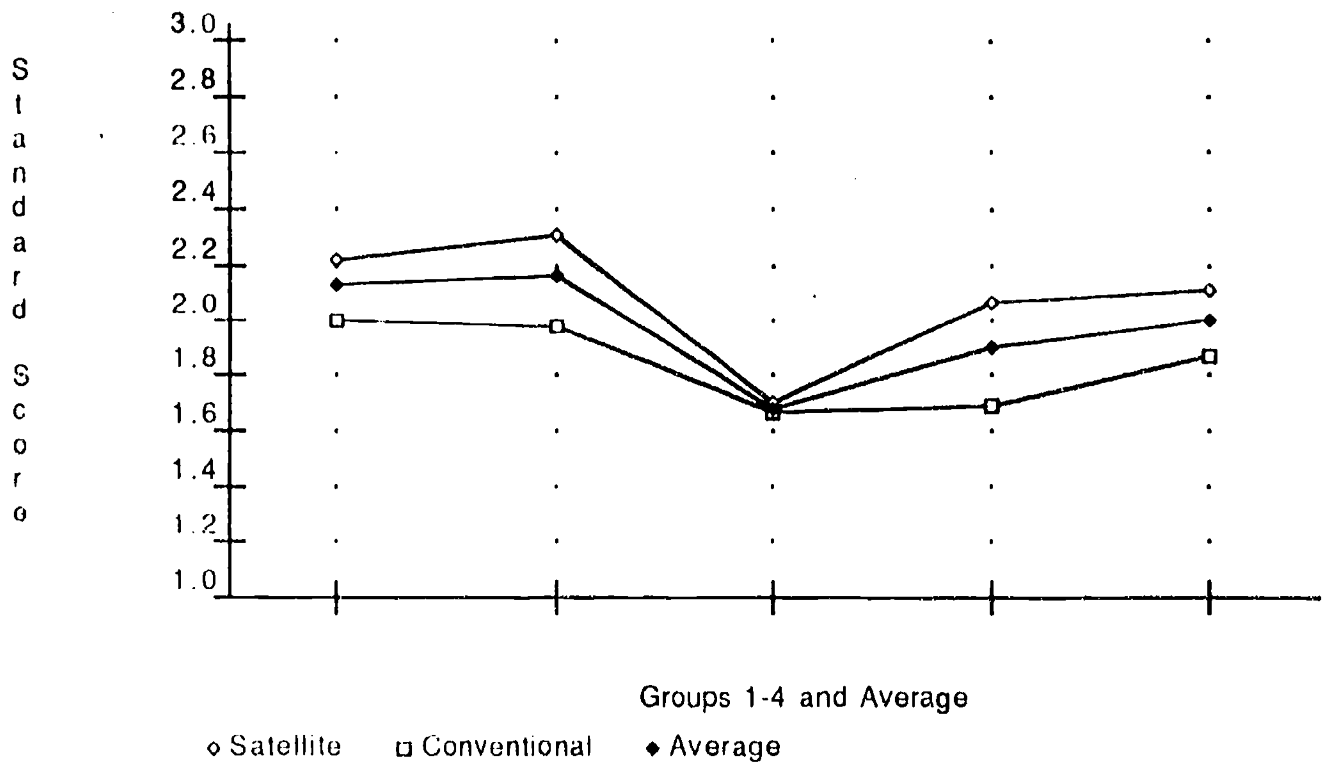


Figure 11
Grades Obtained by Students in Each Course and in Each Treatment Group,
Grades Converted to Standard Scores*

Column 1	=	Course 1	Column 6	=	Course 7
Column 2	=	Course 2	Column 7	=	Course 8
Column 3	=	Course 4	Column 8	=	Course 9
Column 4	=	Course 5	Column 9	=	Average

*For graphing purposes, a constant of 2.00 was added to each standard score shown on Table 22.

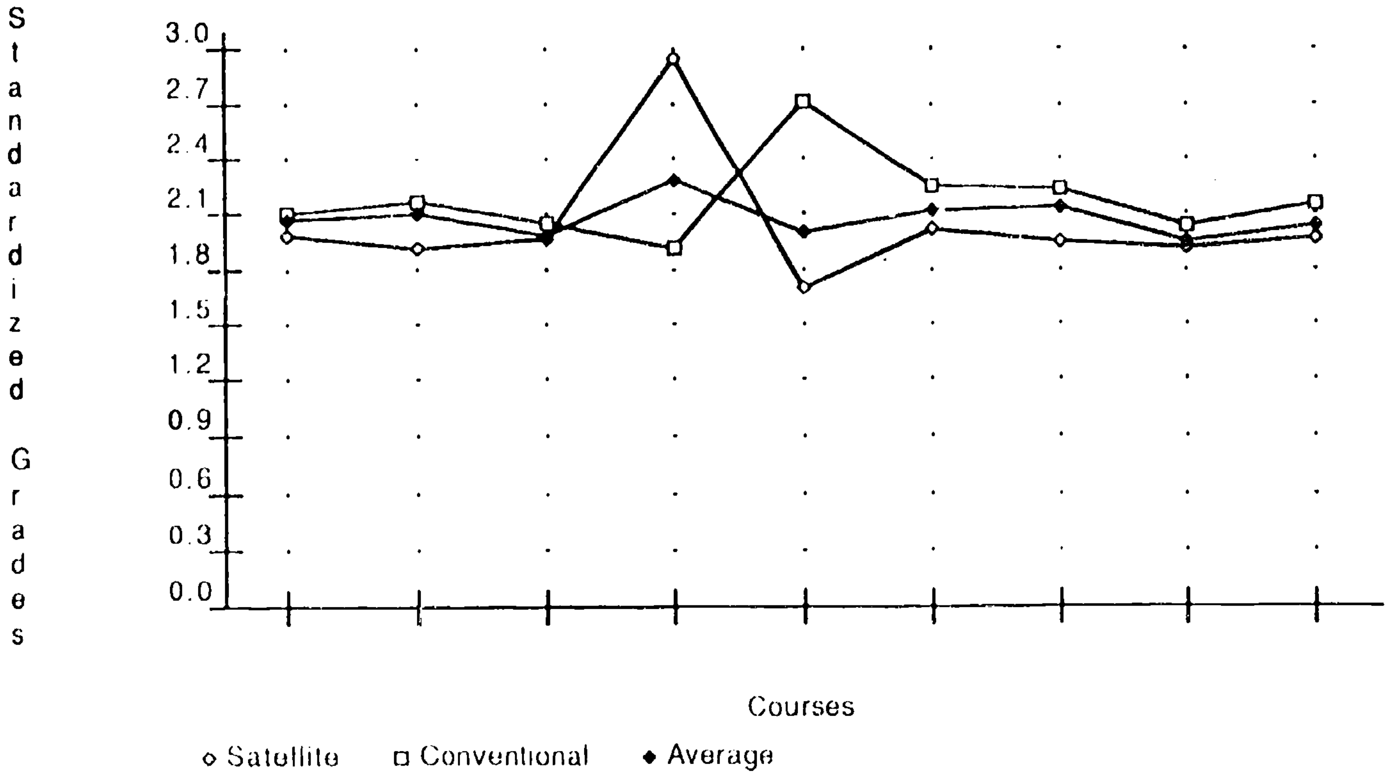


Figure 13
Average Grades Obtained by Classes in Each Course and
Each Treatment Group, Grades Converted to Standard Scores*

Column 1	=	Course 1	Column 6	=	Course 7
Column 2	=	Course 2	Column 7	=	Course 8
Column 3	=	Course 4	Column 8	=	Course 9
Column 4	=	Course 5	Column 9	=	Average

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 24.

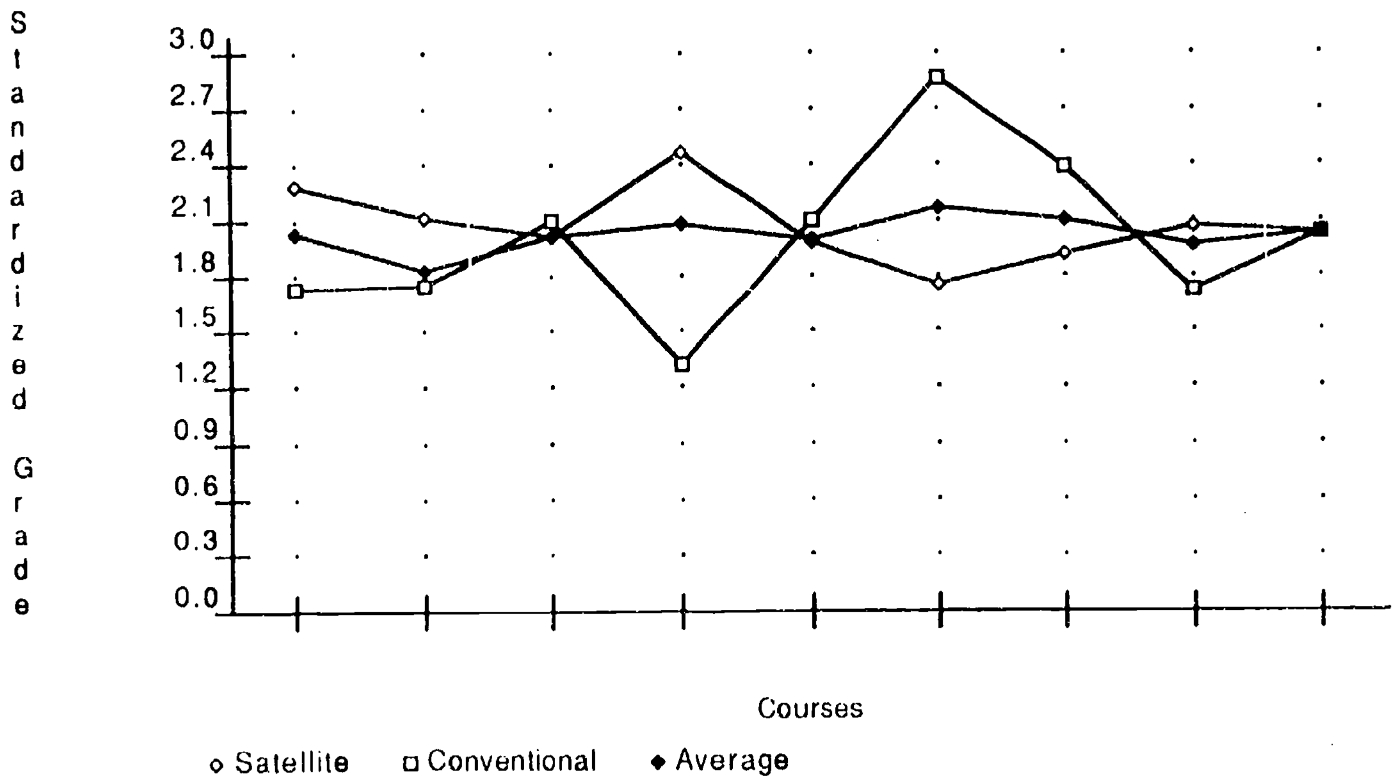


Figure 14
Average Test Scores Obtained by Classes in Each Course and
Each Treatment Group, Test Scores Converted to Standard Scores*

Column 1	=	Course 1
Column 2	=	Course 2
Column 3	=	Course 3
Column 4	=	Course 4
Column 5	=	Course 5
Column 6	=	Average

*For graphing purposes, a constant of 2.00 was added to each standard score on Table 25.

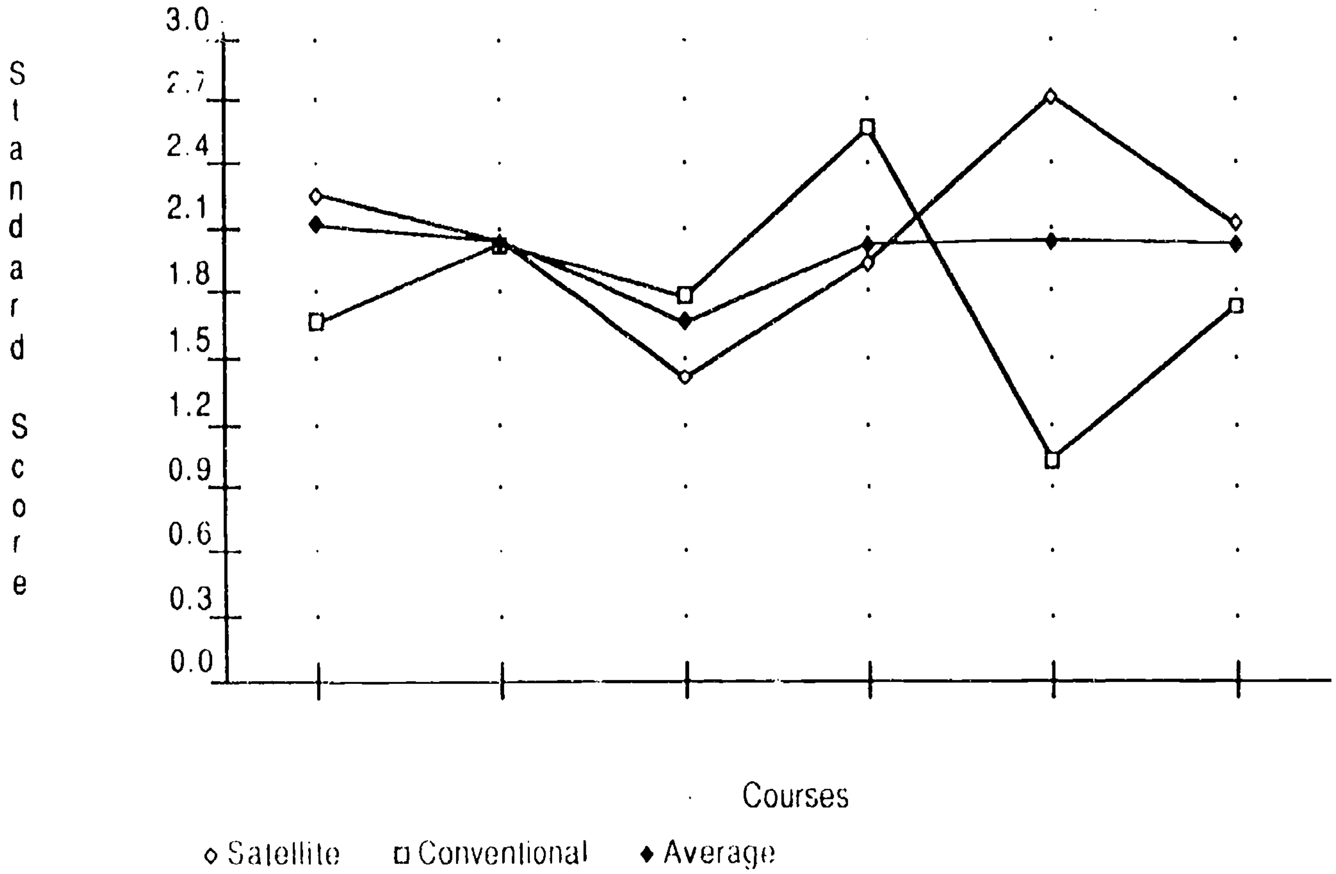


Figure 15
Cohesiveness, Goal Direction*

*This figure illustrates the data from Table 26. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more cohesiveness or goal direction.

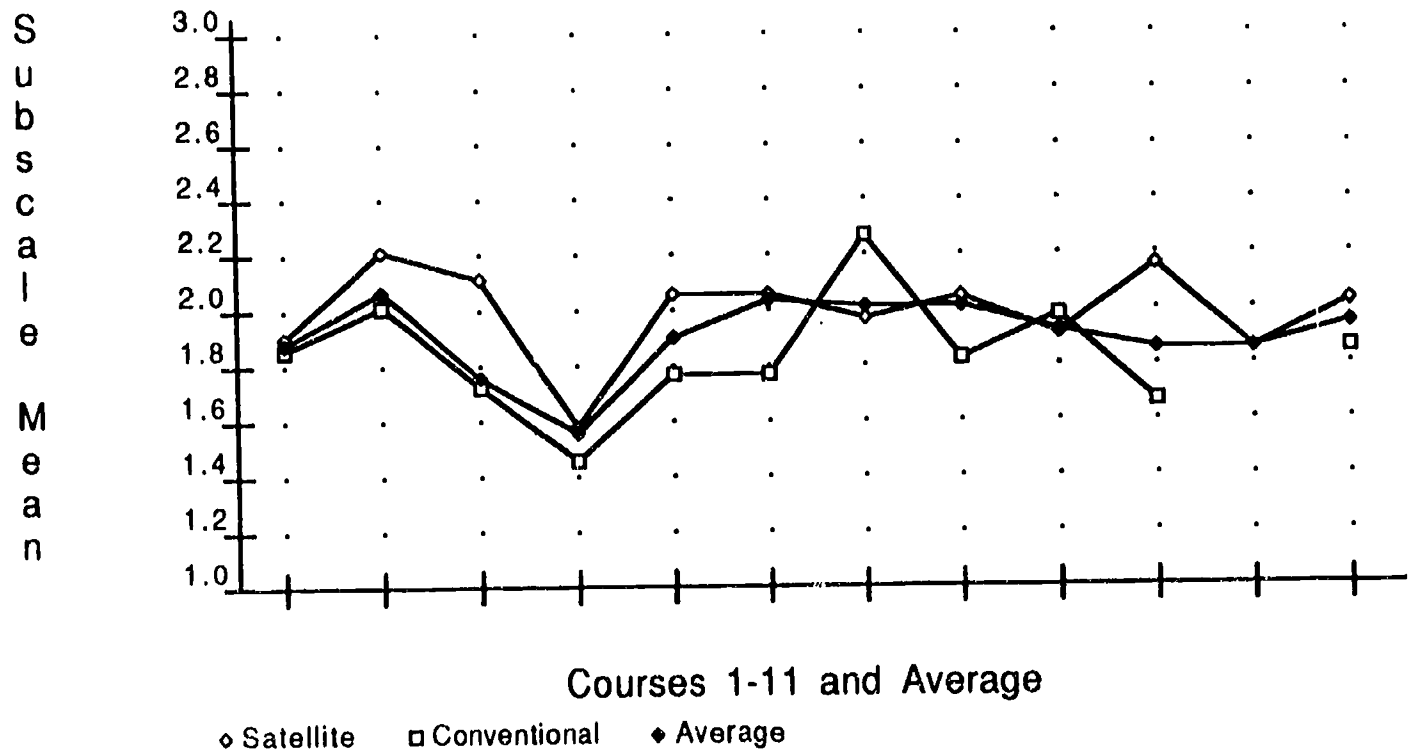


Figure 16
Supportiveness of the Teacher or Teaching Partner*

*This figure illustrates the data from Table 27. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more support.

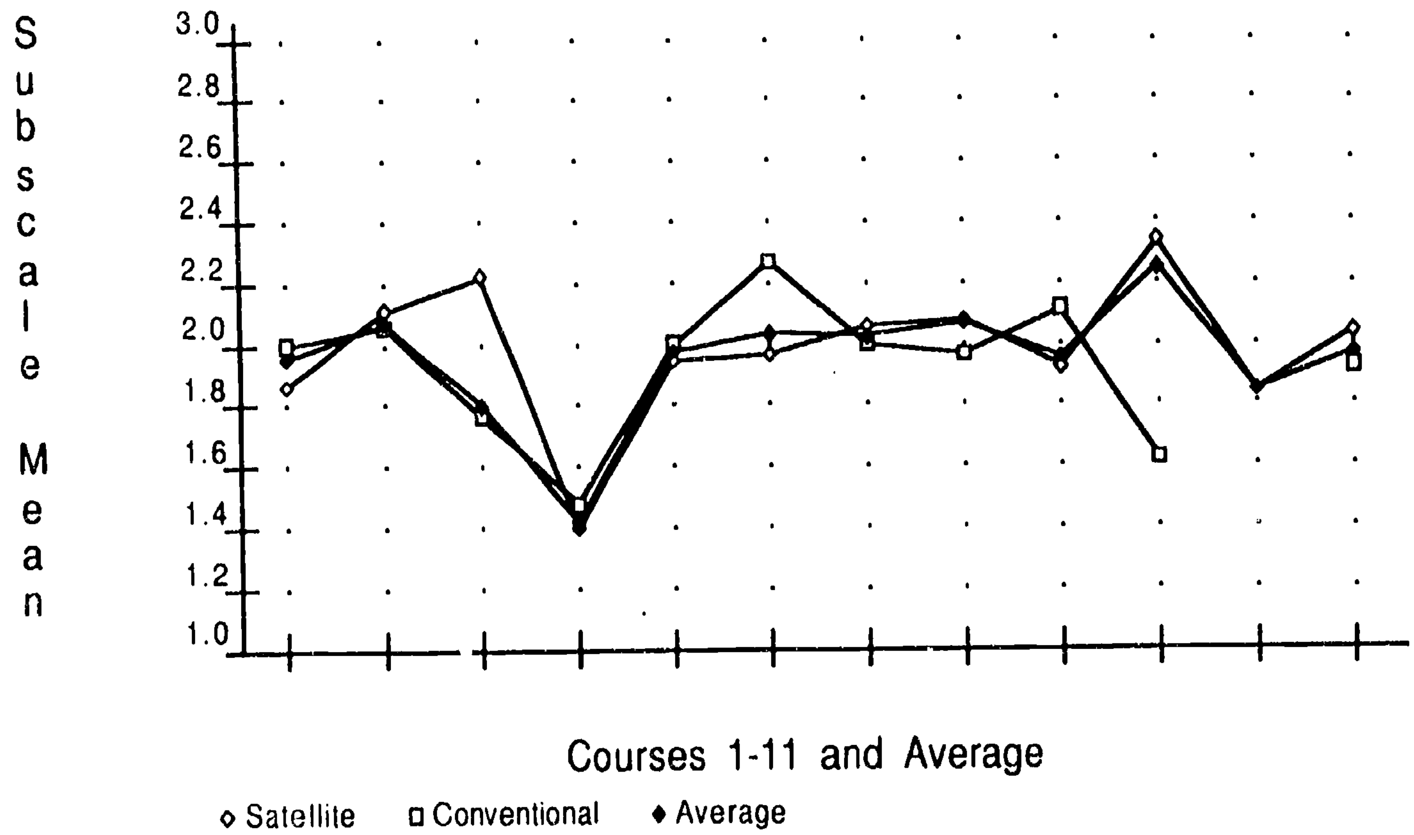
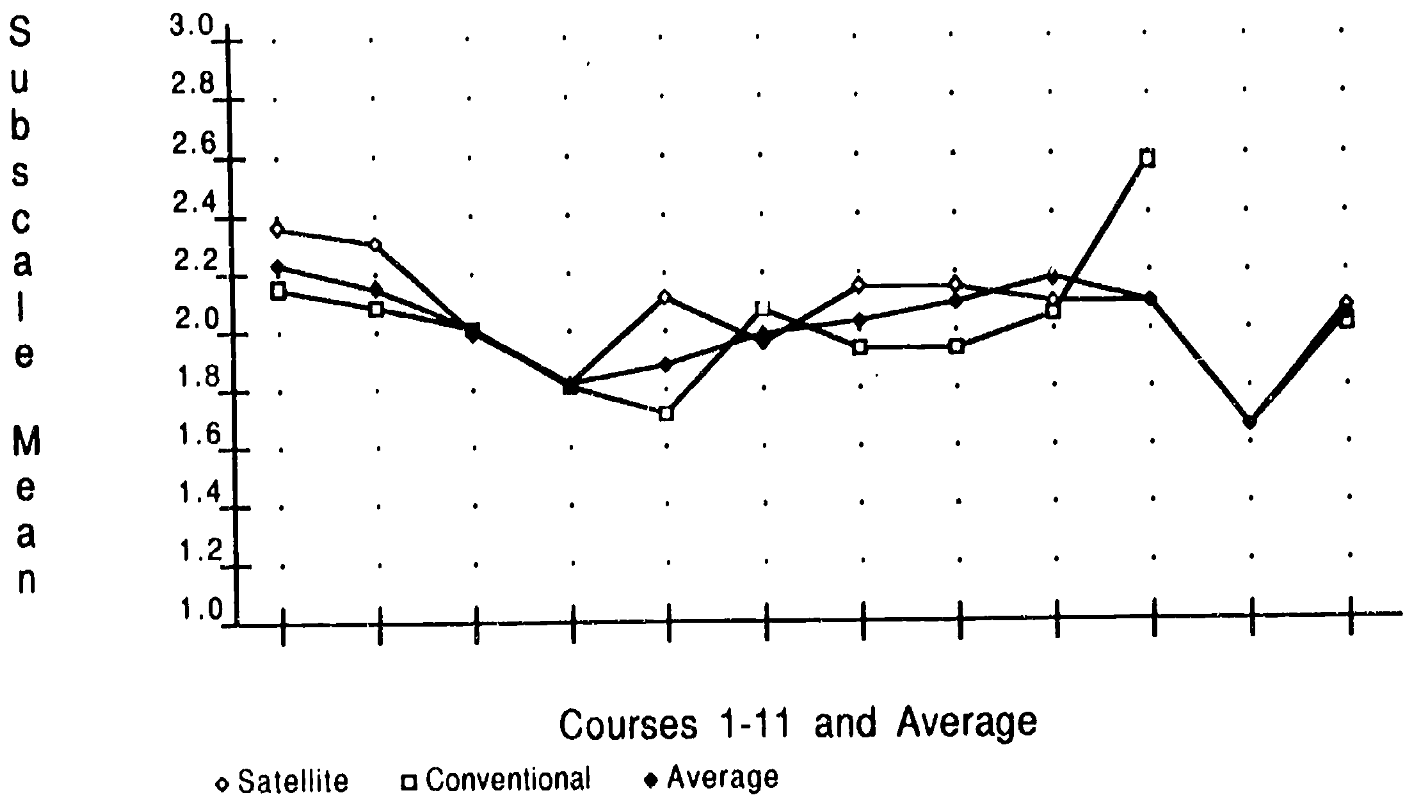


Figure 17
Control of the Class by the Teacher or Teaching Partner*

*This figure illustrates the data from Table 28. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more control.



457

Figure 18
Study Skill Development by the Teacher or Teaching Partner*

*This figure illustrates the data from Table 29. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more emphasis on study skill development by the teacher or teaching partner.

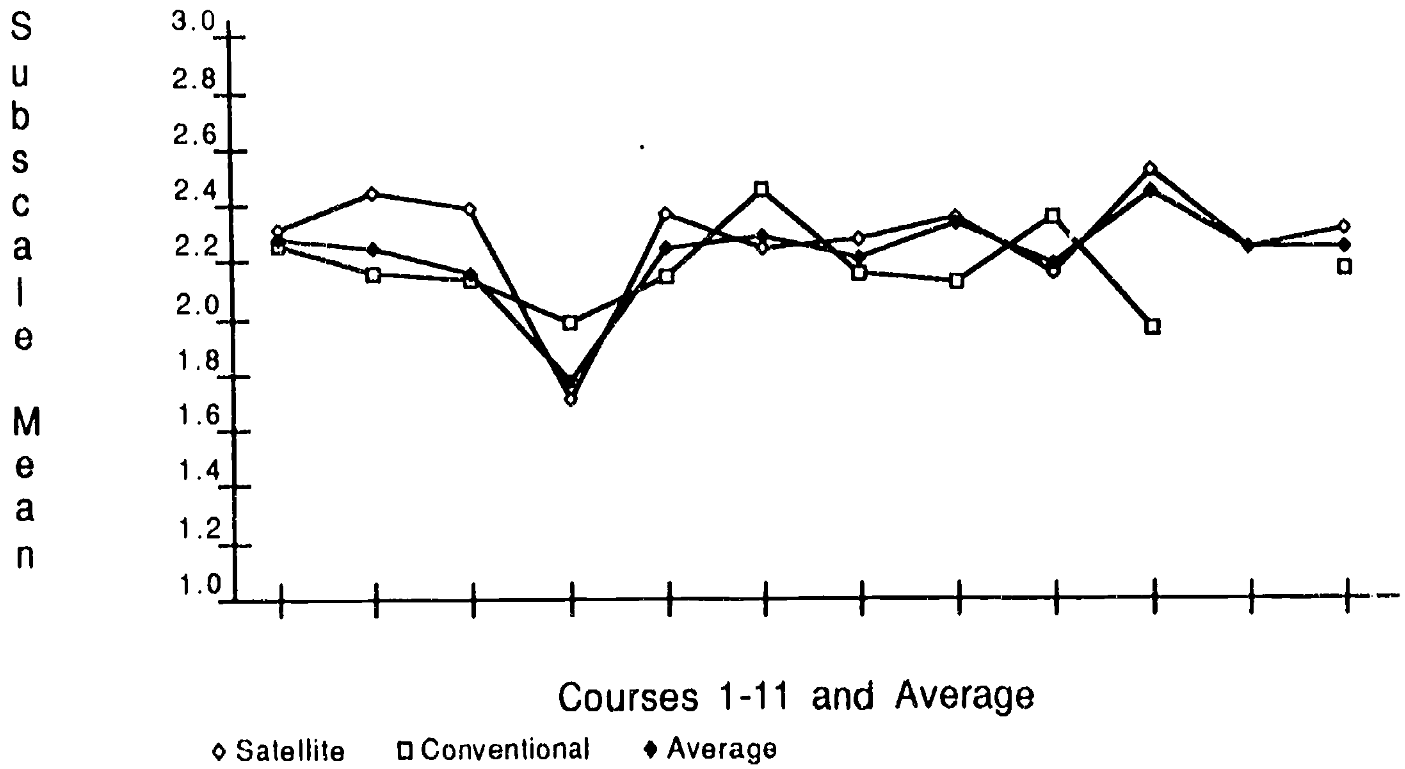


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Figure 19
Enthusiasm of the Teacher or TV Instructor*

*This figure illustrates the data from Table 30. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more enthusiasm.

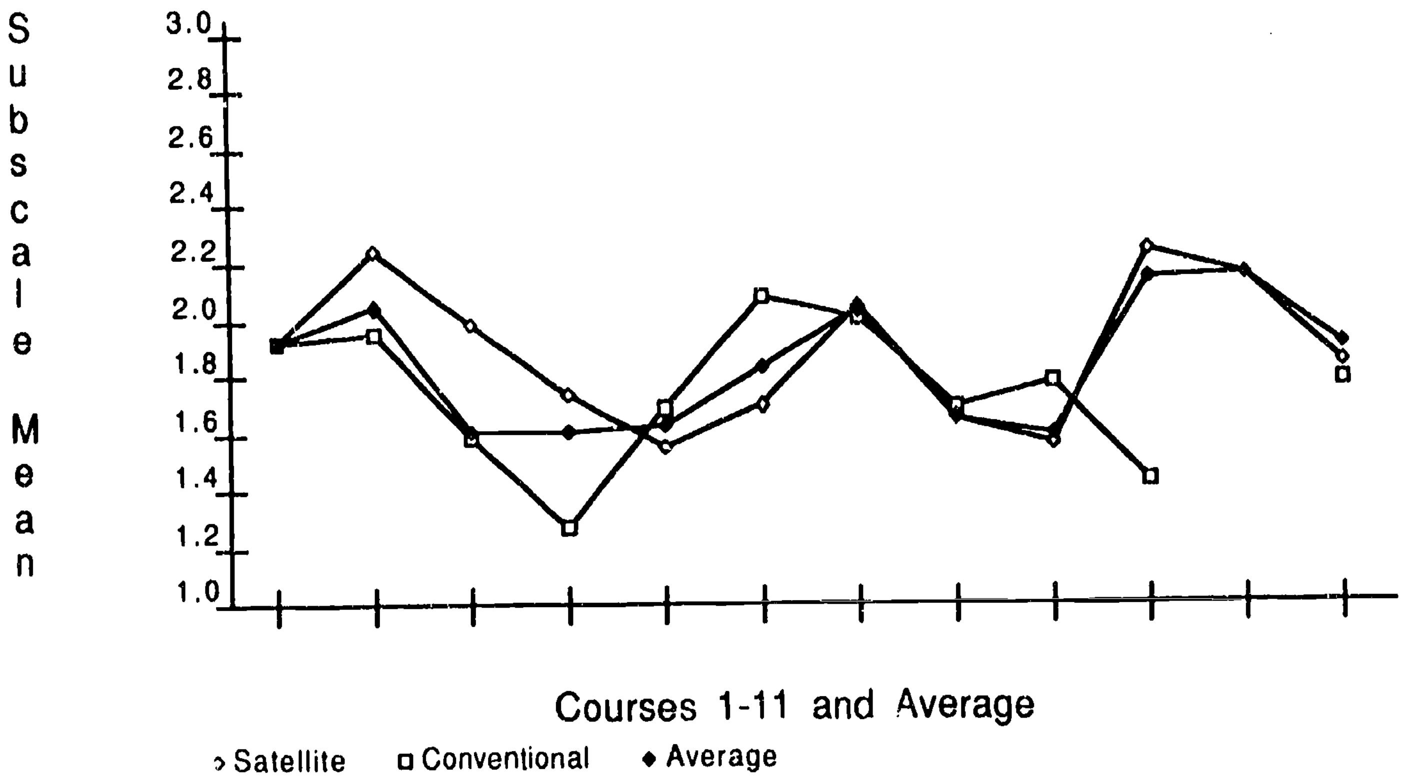


Figure 20
Organizing Skill of the Teacher or TV Instructor*

*This figure illustrates the data from Table 31. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more skill in organizing the material.

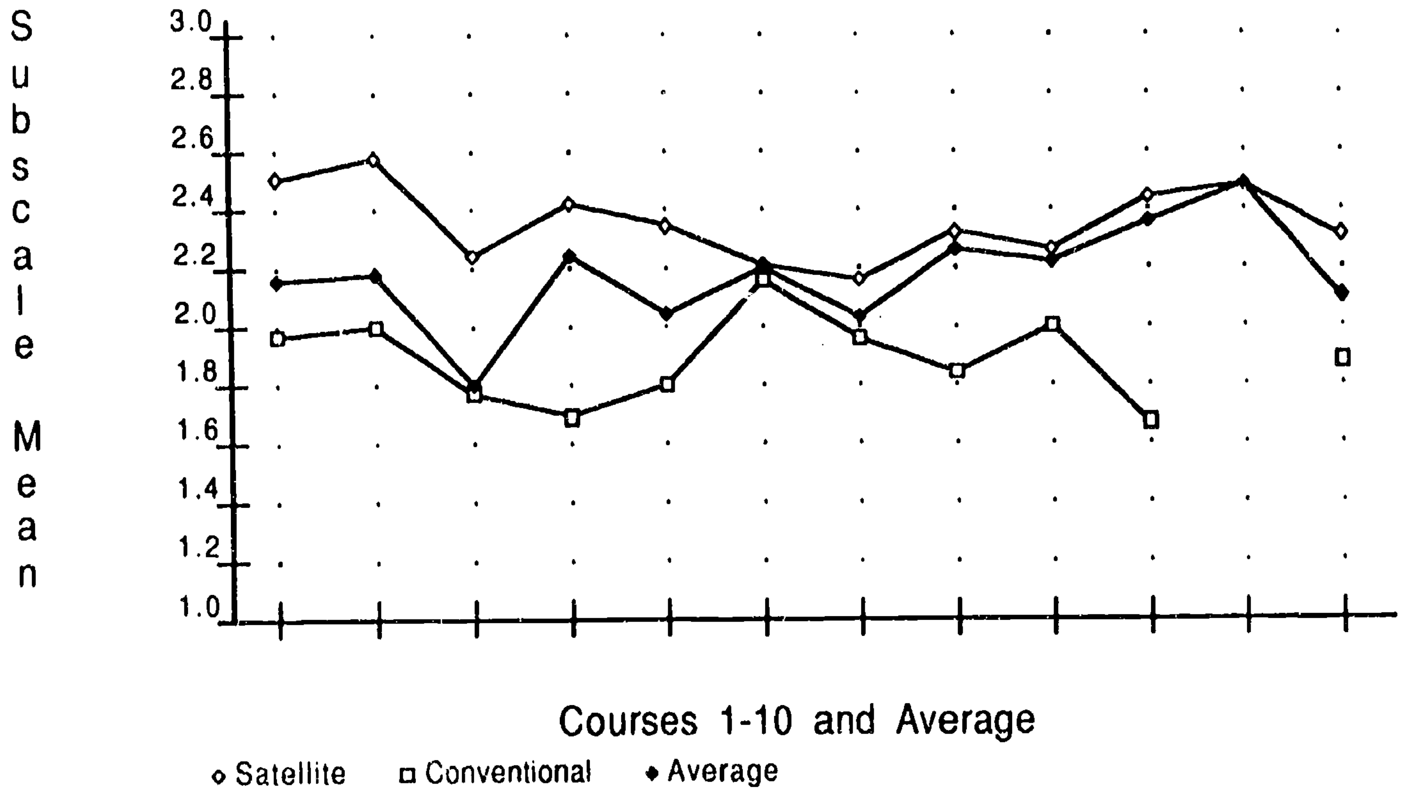


Figure 21
Relating or Explaining Skill of the Teacher or TV Instructor*

*This figure illustrates the data from Table 32. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more skill in relating or explaining the material.

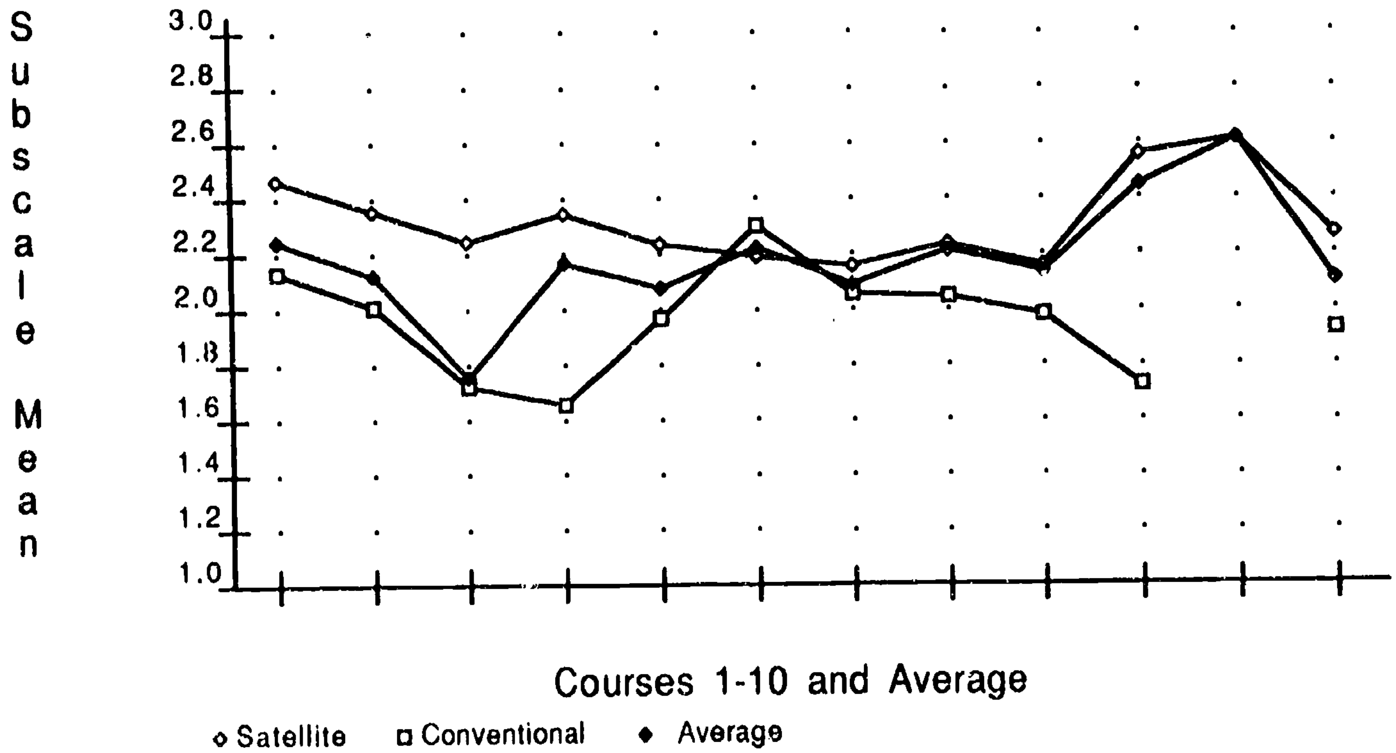
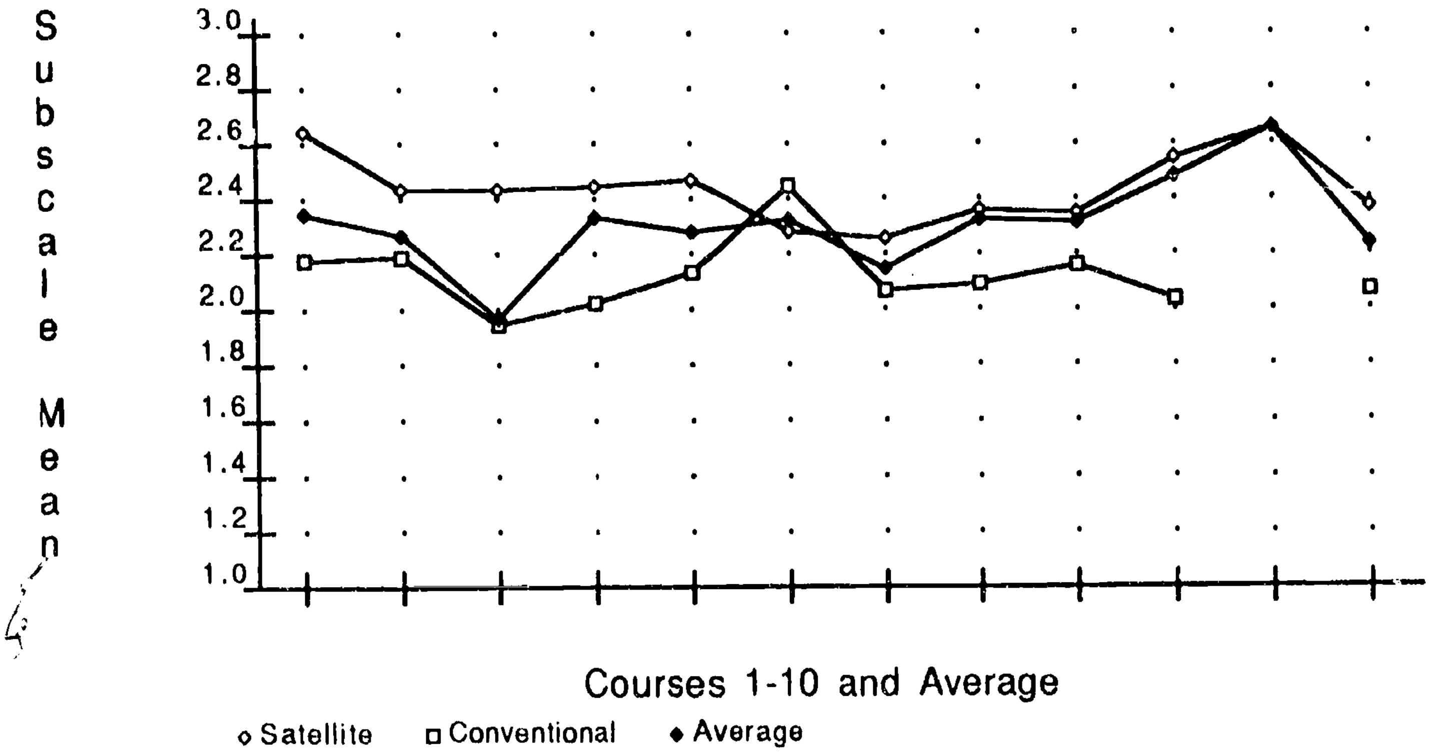


Figure 22
Simplifying Skill of the Teacher or TV Instructor*

*This figure illustrates the data from Table 32. On this scale: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree, so that lower subscale means represent more skill in simplifying the material so that students can understand it.



IV. MONOGRAPH REVIEWING THE RESEARCH LITERATURE

An Introduction to the Monograph
by Carol Speth

One of my duties as research and evaluation specialist for Midlands Consortium was to write "a review of the literature." Such issues as what literature should be reviewed, and for what purpose, were left for time and greater familiarity with the task to clarify. Neither time nor familiarity helped very much. There is a definite literature on distance education, accessible through such journals as Distance Education and the American Journal of Distance Education. Each includes a good deal of material on older forms of distance education, like correspondence study, which did not seem very relevant to Midlands Consortium's concerns. And other authors have mined that literature quite thoroughly, for example, Michael Moore, editor of the American Journal of Distance Education, wrote an extensive "review of the literature" for the Office of Technology Assessment in 1989. Yet several articles we found invaluable and topics we thought were important were not included in his review, so we did not feel our work was redundant. Since Midlands Consortium was involved with secondary education, educational staff development, and the use of various instructional technologies to foster learning, we felt those topics should receive more attention in this review.

Distance education by satellite is too recent to have much of a literature of its own. And we were looking for research, not just descriptions. Some of that descriptive literature is included here, but we tried not to get mired in it. Broadening the topic to technology-based distance education, including computer-assisted instruction and televised instruction, opened Pandora's box. Decisions on what to include seemed unavoidably arbitrary. And the difficulties went well beyond the vastly increased volume of literature.

In a 1981 keynote address to the Association for Educational and Training Technology, David Butts pointed out that the traditional purposes and values of distance education--often called "open education" are actually in conflict with the purposes and values of educational technology. While distance/open education strives to give students more options, to make them more independent and self-directed learners--a terribly inefficient way of going about things, educational technology strives to make the process more efficient, more organized, tightly-structured and centrally controlled. As Butts (1981, p. 26) suggested, gains in efficiency often mean a loss in freedom and/or flexibility and increasing students' dependence. Distance educators traditionally speak a language of humanistic values and developmental psychology; educational technologists talk about planning, production and quality control, task analysis, management by objectives, and systems theory. Instructional designers and technologists' values are often quite different from those of open learning enthusiasts, and judging from the research literature, many lean toward behaviorism or a rather cold mechanistic form of cognitive psychology. So forcing distance education and technology-based education into the same review might have been the cause of some of our problems.

My assistant on this project was a graduate student at the University of Kansas, Mark Byrne. We struggled with this assignment. What we have written is neither comprehensive, nor tightly focused. But we read a great deal--including some literature which has not been discussed in previous works of this kind, and did our best to make sense of it and tell you what we learned. He did the larger share of work on the topical review section and annotated bibliography. I wrote an essay concentrating on those references which seemed most meaningful to me and which related to the issues being investigated in our Midlands Consortium research agenda. That section has its own references. I developed a joint list of references, including citations for all the materials we looked at--some of which are not reviewed or mentioned in the textual portions. The order of sections was another arbitrary decision, but I decided to put my essay first.

PART IV: MONOGRAPH REVIEWING RESEARCH LITERATURE

Important Themes and Concepts in Technology-Based Distance Education: Review of the Research Literature

by Carol Speth

The sheer volume of studies and commentaries on technology-based distance education might lead one to believe that this field has been thoroughly and adequately studied, and that there are few, if any, new worlds to conquer. But nothing could be further from the truth. In fact, upon closer inspection, one finds large and disappointing gaps, so that Peruniak's (1983, p. 64) observation that "research in distance education is only beginning to evolve from its infancy," seems right on target. Morgan (1984, p. 261), said that "Research and evaluation in distance education seem to be entering an important phase in development. A number of writers have lamented at the apparent lack of a clearly defined paradigm for research and the few empirical findings relating to studying at a distance."

Researchers are usually expected to test theory or seek generalizable results, to see themselves contributing to a larger structure of previous studies in their field. The value of any individual study is in proportion to its contribution to that larger structure. Library searches related to the topic of technology-based distance education produced studies on enrollment demographics, student attrition and satisfaction, technical quality, and user acceptance, competently carried out, but unrelated to each other and neither testing nor building theory. There are examples of theorizing about distance education in general, but much of the research on technology-based distance education seems to lack conceptualization and connections to other research on teaching and learning. However, some examples of well-conceptualized or theory-driven research on the process of teaching and learning at a distance through technology will be discussed here.

The legacy of simple comparisons

Early researchers expended a good deal of energy investigating whether use of media for instruction offers any advantages in terms of student learning. Clark and Salomon (1986, p. 465) said that until about 1973, a large number of studies emphasized comparisons among different forms of mediated instruction and between mediated and non-mediated instruction in the search for the "one best medium." Disappointed by the lack of significant differences, some researchers began to argue that media were simply delivery devices and would not influence learning in and of themselves (Lumsdaine, 1963). Schramm (1977) said that "learning seems to be affected more by what is delivered than by the delivery system." Jamison et al (1974) reported that a small number of studies reported advantages for media, others for traditional instruction, but the most typical was no significant difference. Clark (1983) went so far as to say that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition." Clark (1985) reviewed existing meta-analyses of media research and concluded that while most showed positive learning effects over more conventional treatments, there was compelling evidence for confounding. For example, he said the sizeable effect of .5 standard deviations on final exams attributed to computers in the college setting had been used to justify computer-based instruction. However, this effect was reduced to .13 standard deviations in those studies in which the same teacher planned and presented both the computer and the conventional courses. Clark (1983) claimed that this was compelling evidence that the larger effects were due to systematic but uncontrolled differences in content, novelty, and/or teaching method between conventional and media treatments but not to computer-based instruction per se. Even when the same teacher designed both treatments, it was quite possible that slightly different content or methods were included in the computer condition and accounted for the .13 advantage. Clark and Salomon (1986, p. 466) also called attention to a decrease in the differences between media and conventional treatments over time, saying, "it is plausible to hypothesize a novelty effect in these studies and to suggest that students becoming more familiar with the medium expend less effort in learning from it over time." Furthermore, "the introduction of a new medium often allows the production of high-quality materials and novel experiences, or leads to organizational and practice changes not otherwise afforded."

Finally, according to Clark and Salomon (1986, p. 466) "the study of media's effects on learning precludes their treatment as unitary tools such as 'television,' 'radio,' or 'computer.' The common denominator of all television instances, transcending differences of content, task, method of presentation, instructional context, symbolic and formal features used, and the like, is much too narrow. It does not warrant comparisons of 'televised instruction' (or for that matter, 'computer based instruction') with an equally undifferentiated alternative."

Their criticisms of previous studies should not discourage all future comparative research designs, only emphasize the need for a broader, less simplistic view of things, and a search for interactions as well as main effects. One way of focusing on what is delivered rather than how it is delivered was suggested by Olson (1972), who compared different kinds of learning rather than different kinds of media. The three types he discussed were learning through: (a) direct experience, (b) contingent reinforcement, (c) observation of a model, and (d) symbolic systems--each of which might or might not be mediated. Olson said that each of the three types of instruction tends to convey somewhat different information, particularly in cases when the instruction is unsuccessful. Nevertheless, Olson (1972, p.22) says that in cases where it is successful,"instructional forms with widely different topographies not only lead to the same terminal performance, but to some extent convey the same information."

Unique characteristics of television as a medium of instruction

A second way of making media comparison studies less simple-minded was suggested by Bates (1988, p. 214), who strongly objected to Clark's (1983) suggestion that there are no learning differences due to the nature of different media, and encouraged researchers to focus more on the unique attributes of each particular medium. Not surprisingly, Bates (p. 213), long associated with the British Open University, also took issue with what he perceived to be a belief among many distance educators that computers are the wave of the future and educational television has outlived its usefulness. Bates said that television still has a unique role to play in distance education because of its distinctive delivery, presentational, and control characteristics. "It is the only medium which combines words, still and moving pictures, events occurring in real time, slow or accelerated motion, animation and even text. This gives it a power to present information that other media lack." Bates (1988, p. 215) said that television can provide resources available in no other way, not even directly through experience. It can unite distance learners, who cannot share any other common experience, and help learners symbolize important concepts or ideas with audio-visual images. Learning theorists have long recognized that full understanding and internalizing of abstract concepts is preceded by some form of direct experience, and some manipulation or exploration by the learner of the boundaries of the concept. A major presentational characteristic of television is its ability to provide an illustration or concrete example of an abstract principle or generalization. Such illustrations are difficult to provide for distance learners otherwise. Bates (1988, p. 215) said that most of the studies, Clark (1983) was analyzing were comparing a face-to-face lecture with a straight television relay of that lecture or with the text of that lecture, failing to exploit any of the unique presentational characteristics of television.

Salomon conducted a series of studies focusing on the unique characteristics of televised instruction as symbolic communication. Salomon (1979) described those attributes by saying, "all media convey contents; the contents are structured and coded by sometimes shared and sometimes more medium-specific symbol systems; they all use technologies for the gathering, encoding, sorting, and conveying of their contents; and they are associated with different situations in which they are typically used." Like Bates, Salomon distinguished between televised instruction that only employs the technology of television without much emphasis on the medium's symbolic potential, and televised instruction that uses those features, because "only the latter make a difference in the kind of knowledge acquired and the meanings derived from instruction." Salomon (1979) said that students deficient in cue-attending can be guided to focus their attention by the zooming of the camera lens (for example). However, such guidance might actually inhibit learning on the part of those students who had already acquired more efficient cognitive skills that served the same purposes. Salomon and Gardner (1986, p. 17) warned researchers of the possibility that "different learners might attain entirely different goals as a function of their abilities, inclinations, perceptions, and cognitive styles" and said that "hardly any attribute of mediated instruction affects learners' minds in a uniform way."

Perraton (1987) also talked about the unique advantages of different kinds of instruction: the power of broadcasts to stimulate, the power of face-to-face tutoring to relate subject matter to individual response, and the power of print to give permanence (and, one might add, a visible structure) to instruction. Zigerell (1986) said the properties of television that make it effective for instruction include magnifying small objects, and bringing the outside world to the student. According to Zigerell, television is not effective for presenting material slowly over a long time span, and that non-interactive video tends to induce passivity in learners.

Interaction

Interaction between teacher and student is important in any learning environment, but in distance education classes it requires special care and attention. Several authors discussed the role of interaction between learner and teacher in conventional education, how distance makes such interaction more difficult, and how technology can help or hinder that interaction. Murray (1988, p. 12) divided the history of educational technology into the age of broadcasting, the age of video, and the just-dawning age of interaction--each a major step in increasing access and bringing learning more within the control of the learner. Moore's (1989) discussion of the meaning of interaction raised the following questions: What level of interaction is essential for effective learning? What is good interaction? What does real time interaction contribute? Is it worth the cost? Moore distinguished three kinds of interaction: 1) learner-content, 2) learner-instructor, 3) learner-learner. According to Moore, learner-instructor interaction has several functions: to stimulate or maintain interest, motivate the student to learn and promote self-direction. Learner-instructor interaction can be used to try to organize students' application of what is being learned, practice skills, or manipulate ideas that have been presented. Instructors use it to provide counsel, support, and encouragement, or to find out if learners are making progress.

Perraton (1987) listed five purposes served by interaction, feedback, dialog or two-way communication in promoting effective learning. Those five purposes are to: encourage, correct errors, signal difficulties on the part of learner, inform those who prepare educational materials, and allow the learner and teacher to take off in directions which had not been forecast. In face-to-face learning all five types of two-way communication may be achieved at about the same time, using the same channel. Perraton said that in distance education, we may need to organize different channels of communication for each of the five purposes. According to Perraton, feedback in distance education usually takes two forms, impersonal and immediate or personal and delayed. Perraton said a combination of immediate and delayed feedback can lead to effective learning but there is a significant negative correlation between measures of effective learning and the length of the delay. He encouraged researchers to derive more precise statements about the circumstances in which delay and impersonality are more or less important. He says it seems reasonable to assume a contrast between different subject matter areas or different parts/points of the same subject.

Although distance education instructors have always been at a disadvantage in providing opportunities for interaction, in recent years, technology has provided ways to help overcome those disadvantages. The need for interaction between teacher and learner can be met using several different technologies, including interactive television (two-way video), a combination of one-way video with two-way audio (sometimes called "talkback"), or some combination of video and computer technologies, for example, interactive videodisc.

Several applications of technology in distance education use telephones for two-way communication between teachers and learners. Newman (1989) reported on a demonstration training project where the chief function of the telecommunications network was to convey information about the materials and their use at local school districts. It was found that "the most popular activity turned out to be a classroom activity" as opposed to an individual activity. "Classroom time was spent in formulating student questions for the experts (via electronic mail) and later in reading their responses. The excitement and enthusiasm for this activity was very high."

Interactive Television provides opportunities for two-way communication between teachers and students, thus putting the learner into an active decision-making situation, acquiring knowledge, exploring different environments, simulating experiences, and processing information (Dumont, 1988). Morehouse, Hoagland and Schmidt (1987), analyzing results of a study Minnesota's Technology Demonstration Program, including 36 interactive television and 36 traditional classes. They found no significant differences "in the amount or the type of interaction in classes taught via television and those taught by the same teacher in more conventional settings." Teachers indicated that they were generally favorable toward ITV technology, and that participating students "are frequently more motivated and responsible in interactive situations." Students share this favorable attitude, indicating they could see and hear the teacher and each other, and talk to the teacher as often as they wanted. The mean number of observed interactions in ITV classes equaled 261, compared to 270 in traditional classes, which "amounts to a different interaction every 10 seconds for a 50-minute period." Morehouse et. al. (1987) concluded that "a higher degree of interaction correlates with a higher degree of student involvement in classes."

Control

Bates discussed interaction in a slightly different context, that of encouraging learners to take a more active part in the process, using technology to make broadcast material permanently accessible and controllable (by means of videocassette), and imposing their own order, pacing, or structure on the subject matter. According to Bates (p. 220), the value of the videocassette lies not just in its ability to allow students to view programs at more convenient times ("time-shifting"), but also its ability to give learners greater control. Students can also access the material at an appropriate point in their studies, stop and reflect before moving on, and watch as many times as necessary to interpret it. But few students or teachers actually use videocassettes in that way. Murray (1988, p. 19) reported results of a survey on the use of broadcast material in over 200 schools in Scotland, in which the general pattern of use was "competent" but "uninspired and did little to exploit the technology available." The videorecorder was used solely for time-shifting, the programs were watched straight through by classes as though they were live broadcasts. Bates (p. 220) reported that Open University students prefer to watch a program straight through once, maybe go back later, and that students working alone at home rarely stop videocassettes even when told to do so. Bates suggested that more research is needed on how to design videocassettes to exploit their control characteristics: using segments, clear stopping points, indexing, close integration with other media, text, discussion, and by concentrating on audio-visual aspects.

Having earlier noted that television is very different from computer-based learning, which has great difficulty handling situations where a wide range of different responses and interpretations are legitimate, Bates said there are many areas of study in which it is important to develop students' skills in handling open-ended situations (p. 217). He said students usually have two ways of knowing what counts as a legitimate response: discussion with a tutor, or having an opportunity to discuss with other students. Bates said students are more likely to stop the videocassette and discuss it if they are viewing it as a group.

O'Neill (1987, p. 138-9) was enthusiastic about the potential of videodisc, saying the combination of computers and video made it possible to actively involve learners, improve their motivation by allowing them to control their own rates of progress, and provide feedback, prompting and guidance. Murray (1987, p. 16) was also impressed with the power of videodisc to combine the computer's manipulative capability with the impact of audio-visual experience and deliver the material in response to learner need using its superior freezeframe and search facilities. Bates was far less enthusiastic about videodisc, especially within the context of higher education, because of its inability to handle open-ended or unanticipated responses.

Hosie (1989) noted that one important criticism of broadcast television for educational purposes is the lack of possible audience interaction. "A dynamic teaching and learning environment requires interaction between teachers and students and, where possible, among students." Hosie said that while two-way television is not economically viable, it is possible to provide some interactive experiences. One relatively low-cost way of doing that is sometimes called interactive television, in which classroom lectures are relayed by cable or satellite to a range of different sites where local face-to-face tutors handle questions and discussion. In some variations, students at remote sites can phone in questions to the lecturer, who answers them on the air. Bates said that this use of television exploits its distributional but not its presentational or control characteristics. But unlike videocassettes, interactive television provides an opportunity for direct, open-ended interaction between student and lecturer. After teaching two groups of medical students simultaneously, one via two-way interactive television and the other in-person, Johnson, O'Connor and Rossing (1984-85) suggested that the success or failure of a mediated experience would be determined more by students' motivation and their perception of its utility than by any attribute of the instruction or delivery system.

After many years of television research using a "media effects paradigm," Chen (1986, pp. 25-26) welcomed to "a new view of the child as an active information processor," and a recent tendency to see "television-viewing as a complex cognitive task," not just a "passive absorption of images." Chen also said researchers should consider the possibility that passivity and interactivity were qualities of individuals, not just qualities of media, and that it was not necessarily accurate to say that television-viewing is passive and computer-using is active.

<u>Differences among learners</u>

Several authors have discussed the possibility that individual differences among learners might affect their response to instruction, and regretted the lack of much research along those lines. Morgan (1984) was critical of experimental studies in education for using an "'agricultural-botany paradigm'--assuming that students react to different educational treatments as consistently as plants react to fertilizers." Clark and Salomon (1986), had criticized the prevalence of what they called "gross comparisons" which had "little utility for study of specific attributes that may make a difference in learning for some learners on specific tasks." They suggested that while media could be used to cultivate cognitive effects, none of those effects occur naturally as a result of exposure but depend on a number of factors including the effort expended, depth of processing and special aptitudes of individual learners."

Bates (1988, p. 218) used television documentaries as an example of how the unique presentational characteristics of television might enhance learning, but said that many students needed guidance in figuring out how to learn from them. Bates summarized a series of unpublished studies by Bates and Gallagher in which they found that about one-third of Open

University students knew that they were supposed to do with such material in the course and were able to do so successfully. Another third knew they were supposed to interpret and analyze the programs but were unable to do so. The other third not only failed to approach the program in the way intended but did not even know they were meant to do so. They were highly instrumental in their approach to studying, wanted didactic programs and were annoyed at having to watch "irrelevant rubbish." Bates described similar research at TV-Ontario which identified three distinct types of adult viewer. About one-third of their open learners were interested in the world around them and saw television as one more source of knowledge. These learners tended to be older and slightly more educated. The largest group, about half the adult population, was classified as "uninterested learners." They were not interested in formal education of any kind and only watched television for entertainment. A third group, about 15%, were defined as "instrumental" learners. They were interested specifically in learning as a means to an end: qualifications or skills that would lead to better jobs.

Studies at the Open University suggested that students' need for guidance in knowing how to learn from the programs was largely determined by their prior knowledge of the subject, and suggested that television can be of particular value to those students who are struggling with difficult concepts. Bates believes televised instruction is of particular value to "high risk students" and can help keep down dropout rates resulting from course difficulty. Borderline students getting grades of C or D found the programs very helpful, especially in math but also in arts courses. Bates' (p. 217) interpretation was that the higher achieving students were able to follow the course primarily from the text, in other words, already able to work at a higher level of abstraction, and needing less help from television. But for those students who were struggling, television programs were extra help in understanding concepts, probably through the use of concrete examples. He believes television provides an opportunity for all students to analyze real life situations for themselves, and think about what they might do in similar circumstances. It gives them an opportunity to make their own interpretations and develop skills of analysis and application of principles.

Aptitude, Control, Independence

Several published studies on the effectiveness of different kinds of mediated instruction used quantitative methods and focused on such individual differences as ability, aptitude or skill in learning. Gay (1986) contrasted low-aptitude with high-aptitude students in program-controlled and learner-controlled computer-assisted video instruction, found that students can be given more control and independence with a computer-assisted course only if their prior understanding is relatively high (poor learners need more guidance), and concluded that we cannot assume that mediated instruction is equally beneficial to all learners.

Preferred medium, level of achievement, active learning

A study of individual differences related to achievement by college students in India by Gabriel and Pillai (1988) also used quantitative methods. The authors classified biology students as high, average or low achievers, and assessed the preferences of each group for (a) slide-tape, (b) programmed learning ("active"), (c) self-learning material ("content-rich but passive"), or (d) audiocassettes in either English or Tamil. All students preferred the slide-tape material, but as a second choice, high achievers preferred the more active programmed learning materials, average achievers preferred the more passive self-learning material. The language of instruction is usually English, but the low achievers strongly preferred the audiocassette lectures in Tamil, which is their mother tongue. Gabriel and Pillai (p. 219) said, "The high achievers who completed mastery learning in the shortest time prefer to invest less time in other instructional media, but they use active learning processes. To become an active participant, a learner requires sufficient content to form the basis for active involvement." The authors' comments about the low group offer much food for thought for researchers in this country: "The low achiever has to cross the language barrier before attempting to gather more content. Once comfortable with the basic knowledge in the subject, they accumulate more content through . . . passive self-learning material. Such learners are disinclined to become involved in active learning." The authors' observations about use of (six independent and seven group) learning strategies by each category of learners are also interesting: low achievers use more strategies than average and high achievers use fewest; "low achievers have to compensate by making more attempts through passive learning strategies and accessible means of learning." They are "handicapped doubly by deficit in both ability and language comprehension: the number of strategies they use is inversely related to their learning potential."

The issue of choosing which variables to study, quantify or attempt to control, in the absence of much theoretical guidance, is a sensitive one most often raised by researchers recommending qualitative methods because of the relative infancy of research in distance education. Peruniak (1983, p. 65) said that "at earlier stages in a line of investigation, finding out what to control is more important than control for control's sake." For example, there is no reason to group subjects according to age unless one has evidence for assuming such differences might be important. Even "ability" and "aptitude" are not especially helpful as variables, unless one is more specific about what kinds of ability or aptitude are relevant to the learning task at hand. Peruniak (1983) conducted a qualitative study of 38 adult distance learners in Alberta, Canada. The three critical variables which emerged from that study were motivation, study strategies and time, and degree of interaction with their university tutors.

Morgan (1984, p. 254) was critical of previous experimental research comparing the effectiveness of various media for failing to provide any guidelines on how to use educational television, and for the lack of any theoretical framework concerning how students learn from television. He also said the requirement of experimental control of variables forced these studies completely outside any real learning context. Morgan (p. 252), wrote to explain "the advantages of qualitative research methodologies which presently are underrepresented" in distance education research, and to describe "some of the insights into how students learn which can be gained through these methodologies." Morgan believed that the clearly-defined paradigm so long absent from research on learning at a distance could be based upon one developed at Goteberg University in Sweden for investigating learning from the student's point of view. "A fundamental concern of the Gothenberg research is what students actually learn from studying and the different ways in which learning is conceptualized" by students (Morgan, p. 255). Learning can be seen as the acquisition of pieces of knowledge and information, or, it can be seen as a change in one's way of conceptualizing an idea or aspect of reality. Morgan (p. 261) said, "The concepts of learning outcomes, approaches to study, conceptions of learning, and orientations to studies" developed in research with conventional students, "provide a conceptual framework which is equally powerful for understanding how students learn in a distance context. Although the overall social context is different in distance education, the detailed processes by which an individual actually learns are remarkably similar."

In analyzing some of the differences between conventional and distance education, Morgan suggests several potentially fruitful avenues for future investigation. One difference is the relative lack of opportunities for individualization if a skilled teacher is not present to identify students' needs and deficiencies. Finding out what is required of them is probably a slower and more difficult process for distance as compared to conventional students. Furthermore, the absence of a peer group can make figuring out what or how to study even more difficult.

Motivation

The enormous importance of motivation--which determines the amount of time and effort invested in learning--is emphasized by several authors. For example, based on his reviews of the literature, Perraton (1987) proposes a "theory of media equivalence"--that communications media do not differ in their educational effectiveness, unless questions of motivation are involved, which is nearly always the case. Perraton also suggests that distance teaching programs which use a combination of media may influence learning indirectly through motivation, and the need for face-to-face, tutoring varies inversely with the motivation and sophistication of the learner--but he says this last statement will only advance us if we can put some quantities to the terms "motivation" and "sophistication."

Salomon (1984) suggested that the amount of mental effort invested in mindful processing depends on the learner's perception of the relevant characteristics of the medium and task, and their own perceived self-efficacy in elaborating the information they receive. Salomon conducted a series of studies in which he found that television is perceived to be mentally less demanding than print material of comparable content and that learners report investing less mental effort in television. This led the more able students to generate less inferences from such material. Students mobilized their abilities to make inferences when their perceptions of task demands were manipulated by the experimenters. The only variable that accounted for learning differences was an estimate of the amount of effort invested provided by the learners themselves on a post-treatment questionnaire, thus supporting the claim that students' motivation to invest time and effort affects learning independently of the type of instructional delivery.

Students At-Risk

Based on a review by Brophy (1988, p. 256), one would predict a gloomy future for technology-based distance education for low achieving students, because they "need more structuring from their teachers, more active instruction and feedback, more redundancy and review, and smaller steps with higher success rates." Brophy (p. 235) also says the key to achievement gain by such students is "maximizing the time that they spend being actively instructed or supervised by their teachers." Brophy said teachers must carry the content to students personally. He took a dim view of individualized instruction, saying it "demands a combination of functional literary direction-following skills, independent learning skills and habits of sustained concentration or motivation that is almost non-existent in the primary grades and is likely to be seen only in a small minority of students in the intermediate and secondary grades." Furthermore, low socioeconomic and low-achieving students are lower in academic self-confidence and higher in anxiety and alienation, and are more likely to require warmth and support.

Jones and Friedman (1988, pp. 303-304) responded to Brophy, writing from a cognitive, as opposed to a process-product perspective. They agreed that both Chapter 1 and other students should be taught in much the same way, but suggested Brophy might be selling Chapter 1 students short by relegating them to a second-class, passive form of learning. Jones and Friedman said "the strong emphasis in the process-outcome perspective on teacher management, supervision, and explanation implies that the learner is essentially a passive recipient of information provided by the teacher." Jones and Friedman (p. 306) worried that "a quick or careless reading" of Brophy might lead to the conclusion that the curriculum for Chapter 1 students should emphasize basic skills and de-emphasize flexible or complex skills, thus reinforcing the "too prevalent tendency to differentiate instruction and learning opportunities for high and low-achieving students."

Gabriel and Pillai (1988) suggested that low-achieving students need to reach a certain threshold level of content knowledge before they are willing or able to learn from some instructional media. Even though all Bates' research had been with Open University students, he offered some reasons for optimism concerning the potential of televised instruction for low-achieving students by by furnishing concrete examples and helping them grasp difficult abstract concepts.

A New View of the Learner--Cognitions Mediate Stimuli

Clark and Salomon (1986, 472) said that most previous research on media in instruction centered on the means of instruction as independent variables and on learning outcomes in the form of knowledge or skill acquisition as dependent variables, so "the basic paradigm which originates from the behavioristic assumptions about human learning has not changed even though cognitive processes have been introduced as mediators between stimuli and responses." Yet cognitions do more than mediate stimuli, they also partially determine the way learners experience stimuli. "What the student thinks or believes to be the case about a particular mediated presentation or class of media can come therefore to exert at least as much influence over learning as the medium itself." This might include beliefs about the medium's difficulty level, its entertainment potential, the type of information usually presented and typical instructional demands. For example, Ksobiech (1976) told college undergraduates that televised lessons were to be evaluated by them, were to be entertaining, or were to be the subject of a test. The group told they would be tested on the lessons performed best, those told they would be evaluating the lessons came in second, while the group told the lessons were for entertainment performed least well. The test group also persisted longer than the other two.

This new research paradigm, which includes paying attention to student cognitions, "ascribes the learner a far more active and less externally controlled role." According to Clark and Salomon (1986, p. 473), "the change we anticipate in the basic paradigm on media and technology is not from an instructionally-centered 'situational' approach to a learner-centered 'personological' one, but rather from a unidirectional to a reciprocal view." As an example of research from a reciprocal point of view, Clark and Salomon said, "It would be interesting to study how the perceptions and attitudes of computer users guide their strategies for learning from computers, how these different strategies influence learning, and how work with computers changes or maintains these perceptions reciprocally." Or to paraphrase Salomon and Gardner (1986), researchers should ask not what televised instruction does to students but rather what students do to (or with) the televised instruction.

A New Research Paradigm

What Clark and Salomon called a reciprocal view of research on mediated instruction is similar to what Ramsden (1987) called a relational approach to research on teaching and learning, with or without technology. According to Ramsden (p. 281), "A relational approach has educational humility," for many reasons. For one, it is no longer so easy to specify in advance which variables are independent or dependent, since all variables are embedded in an educational context. Furthermore, "Students react to educational situations differently from the ways experimenters predict. This is because they react to the situation they perceive, not always the one that researchers and teachers define." As Morgan (1984, p. 264) explained it, "learning always occurs naturally in a context . . . the context of learning is not described independently of the learners, but rather through their eyes."

Tobias (1982, p. 6) also emphasized the need to examine students' perceptions, cognitions or what he called macroprocesses--the frequency and intensity with which students process instructional input. Tobias suggested that "comparisons between different response modes, different instructional methods, different media, or different technological devices obscure the most important variables accounting for student learning." Looking back at ten years of Aptitude-Treatment Interaction research on individual differences (in aptitudes, prior achievement), and instructional treatment, Tobias (p. 5) said those rather disappointing results might be due to failure to look at macroprocesses. "External differences between instructional treatments, whether they are educational media, methods of organizing classrooms or technological devices, are important only in terms of the degree to which they influence students' cognitive activities while engaged by the instructional content."

Tobias went on to say that, "any teaching method, instructional organization or instructional technology that stimulates students to actively attempt to comprehend the material, organize what was learned previously, and relate it to their prior experience will facilitate student learning. On the other hand, anything that reduces a student's efforts in this direction will reduce what is learned." Morgan (1984, p. 255) said that "To really understand' a set of ideas concepts or subject area it seems that the learner must engage in a de-structuring of the knowledge or subject material, followed by a re-structuring, of the material in relation to the learner's existing conceptual framework." Learners can be helped or hindered by the assessment practices and workload of a given course.

Conclusion

Nisbet (1981,p. 23) also talked about the need for educational technologists "to be more sensitive to the context of learning, especially the social context, for education is a social activity rather than a technological one, one in which motivation and the sense of personal involvement are even more important than in industry where many of these lessons have already been learned." Nisbet suggested that educational technology, curriculum development, educational research, and the development of student learning are related endeavors under a large umbrella that might be called "educational development," and that all could benefit from closer integration and linkages. He talked about how workers in all those vineyards sometimes become discouraged about whether they are having any impact on education. Often it seems that innovative practices--whether technological, curricular, or building upon new insights in the psychology of learning--are simply grafted onto traditional practices, for, as he said in one of his most memorable phrases (p. 18), "changing a curriculum is as difficult as moving a cemetery." Nisbet suggested that part of the difficulty in identifying, measuring or assessing the impact of instructional technology or educational research is that we are using the wrong model. He quoted his interview with the Chief Education Officer of Manchester, England, who said the impact of research findings is not like that of a neatly-wrapped parcel being delivered, opened and immediately used by the receivers. "It is more like a canister of gas being released somewhere. It blows about, and at any one moment, if you were walking down the corridors you could sniff it," but you would not necessarily realize what it was or which direction it was coming from." According to that metaphor, the dearest hope of instructional technologists or educational researchers might be that it was a good odor and not a foul or harmful one! Nisbet (1981, p. 20) wrote "The indirect or long-term effect of educational technology is in providing a theoretical basis, a rationale, for the improvement of teaching." Nisbet might have said that educational technology has its greatest impact when it is "just" grafted onto traditional practice, becoming part of an existing organic whole rather than a separate and therefore more vulnerable entity. Nisbet went on to say that "educational technology has made some teachers think, and has given them a model for their thinking: and there is better teaching and learning as a result." Those who teach courses by satellite and those who serve as teaching partners often say those experiences made them better teachers, more organized, more focused, more reflective.

Researchers (for example the Midlands Consortium-sponsored study by Talab and Newhouse) are only beginning to investigate how using a particular type of instructional technology, for example, satellite instruction, influences how teachers teach. Another interesting question for further study is whether learning by satellite, or from some other form of instructional technology, encourages students to notice differences among various teaching strategies (rather than focusing on more superficial teacher characteristics, for example physical or personality traits). Some of the data gathered formally and informally for Midlands Consortium suggested that secondary students who took courses by satellite did become somewhat more aware of how they learn, and of how their adoption of different learning or study strategies affected the amount and quality of their learning. Thus, in spite of the literature reviewed above, and all the findings generated by the Midlands Consortium Research and Evaluation Center and summarized elsewhere in this report, prospective researchers in the broad field of technology-based distance education will find there are still many new worlds to conquer.

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Outline of Topical Review

Topical Review

by Mark Byrne and Carol Speth

In this section, we sorted a substantial portion of this literature by topics (which were emergent rather than preconceived), suggested some organizing principles, and tried to identify connections among references.

Learning Theory

The "What" and "How" Distinction in Instruction

It is important to keep in mind the distinction of "technologies of transmission" versus "technologies of instruction" when considering any theory of distance learning (Richardson, 1983). The former refers to how the message is transmitted, be it morse code or hot air balloon. But the latter is a list of strategies, supported by research, and demonstrated to be effective for learning: build movement, color, and humor into a program; provide clues in science programs which facilitate discovery; reinforce, prime, shape, and motivate.

> The most important issue, seldom addressed by instructional technologists, is which of the many instructional methods which are available should be transmitted by an instructional medium. This decision rests less on the technology of transmission than on our current knowledge of instructional research and development. (Richardson, 1983, p. 10)

Most of the excitement surrounding the development and implementation of new media is focused on the "how" rather than the "what" of transmission. There is always the hope that some intrinsic feature of the machinery will directly affect the quality of learning and solve classroom problems in a more efficient manner. Part of the responsibility for this attitude must be laid at the feet of those responsible for the production of both software and hardware, and their advertisers. Selling technology to the educational community, and especially the individual student, is usually a higher priority than verifying the quality and benefit of the instructional content. However, it is important to note that many of the features of an attractive program--such as music, fast-paced and concise delivery, and unusual visual features--designed primarily to make the program attractive to the buyer, are the very features which enhance learning and recall.

Several authors have suggested that there is an urgent need for achieving more consensus on criteria for evaluating instructional programs designed to foster learning through advanced technology. Bates (1988), who for many years was the head of the Open University's Audio-Visual Media Research Group, would turn our attention away from the more superficial or market-inspired features of technology-based instructional programs to begin exploring the relationships between particular types of learning and particular characteristics which are unique to each medium of instruction. Down through the years, Bates and his associates at the British Open University have studied the links between distinct features of television presentation and individual differences in learning style. According to Bates, establishing such links among presentational features and between those features and learner characteristics is a vital excercise for those seeking to justify the use of new technologies in education. Bates and others have said that the development of theories in the field of technology-based distance learning is the first step in justifying design features and applications. Development and testing of such theories would be essential if researchers are to answer the questions raised in the National Commission on Excellence in Education's (1983) landmark publication "A nation at risk: The imperative for educational reform."

At present, it is hard to provide commercial producers with clear guidelines for instructional design, and the reason is probably the lack of theory in distance education (Wiesner, 1983). With the exception of studies generated by the British Open University, the literature on learning at a distance has focused almost solely on the technology rather than on the learner. The successes of the Open University may be due to their focus on the entire delivery system, both the "what" and the "how" of instruction, even to the point of asking about supplementary features such as support of the learner. Developing an understanding of effective distance learning is obviously a multi-disciplinary endeavor.

Cognitive Style

During the last ten years some theories on learning and technology have appeared, long after the effects were researched and reported. It is surprising that these theories have taken so long, when many authors note how ideal many of the new media are for studying learning (White, 1983; Papert, 1980). One of the most popular of these theories centers on the cognitive events initiated and fostered by a particular symbol system contained in some medium (Clark & Salomon, 1986). However, a simple relationship has not yet been established between a characteristic which is unique to a medium (e.g. television) and a corresponding cognitive skill (e.g. synthetic thinking). Rather than isolating a single skill for a given medium, it may be more productive to assume that many cognitive skills are usually affected because of dimension which are common to several media, and by attributes of each medium which are shared with traditional materials, such as the chalkboard. Research should be concerned with the detection of functional equivalence across cognitive effects, and the relative cost and efficiency of new technology over other means in achieving these effects.

It is interesting that extensive research in cognitive skills and media attributes has not produced a host of exciting outcomes accountable only to the emergence of new technology. This is an important lesson to which we may not be attending. Wilber Schramm of Stanford University summed up the situation back in 1972 (cited in Baldwin, 1987, p. 41):

> At least two straightforward guidelines stand out from the research papers we have reviewed. Effective television can be kept as simple as possible, except where some complexity is clearly required for one task or another; students will learn more if they are kept actively participating in the teaching-learning process. Simple television--active students.

The implication is that the principles of learning dealing with motivation, organization, presentation and cognition, which have been found to be effective in traditional classrooms, are the same ones operating in television-mediated or other distance education settings.

Yet we should also be aware of how little we know about the effects of presentation through a given medium on a particular style of thinking. This is largely due to the speed with which existing technology has moved ahead of our knowledge of learning and instruction (Duchastel, Brien, & Imbeau, 1988-89). This situation is going to remain for some time to come; more sophisticated means of communication and teaching will continue to appear ahead of models accounting for their effectiveness. Duchastel et al note, for example, how intelligent computer-assisted instruction (ICAI) is a highly flexible means of learning, in strong contrast to traditional receptive learning. Although established educational theory has carried over well into the field of distance learning, we cannot anticipate how soon new models will be required since we cannot predict tomorrows' inventions and applications.

Cognitive style has frequently been studied to account for the effectiveness of distance learning. For example, learning style has been found to be a predictor of dropping-out and helps explain low university correspondence course completion figures (Thompson, 1984). Students who are most likely to complete courses using distance technology have a cluster of important characteristics such as a tolerance for ambiguity, a need for autonomy, and an ability to be flexible. In contrast, those who are more likely to drop out tend to prefer a great deal of structure, face-to-face lectures, and the opportunity to interact with the instructor. According to Thompson, these research findings may be easily explained in term s the classical dichotomy of field-dependence versus field-independence. In short, distance learning is more naturally suited to students who are field-independent.

While many authors suggest that the emerging literature in distance education might benefit from basing more new research on well-established theoretical models, even though these models were developed in more conventional educational settings. According to that line of thinking, the next step would be to examine the unique features of distance education and refine theories. However, some authors, for example, White (1983) in her book, The Future of Electronic Learning, contradict the position that a new theory for distance learning can be built on traditional models. White suggests the need for a new psychology of learning at a distance from technology. This new psychology of learning would include such topics as the nature of imagery, visual literacy, peer involvement, and entertainment.

Individual Differences

One of the major thrust of the work of Bruner and Olsen (1974) and Salomon (1971) has been linking learning characteristics to different media of instruction. The assumption is that, since a distinction exists between the content of a message and the means of transmission, learners will respond differently to the same information, depending on the medium. A concept can be understood in many ways using different metaphors and be enriched through different sensory modalities. If each of us represents ideas in different ways and with varying degrees of enrichment, then different media will be suited to each learner depending on his/her interpretative skills (Brown, Nathenson & Kirkup, 1982).

However, if present models of memory are accurate, it is widely agreed that multisensory experience is superior to learning through any one modality. Current models of memory also suggest that multisensory experience results in a memory trace which can be accessed more easily and cross-referenced in a more complex fashion than any unisensory experience. Therefore, we should not ask "which medium is better?" but rather "how varied can we make the learners experience?" and "is a multimedia experience an example of enriched learning?"

Motivation

In the history of instructional design, the role of motivation has always been recognized as an essential component of effective learning. The sources of motivation have generally been divided into extrinsic sources--based on behavioral psychological theories, and intrinsic sources--based on cognitive psychological theories.

In an unusual approach to studying motivation, Malone (1981) focused on what makes computer activities fun rather than on what makes them educational. He concentrated on one particular type of activity--computer games, and eventually developed an elementary theory of intrinsic motivation based on the concepts of challenge, fantasy, and curiosity. Simplifying Piagetian theory, Malone (1981, p. 357) stated "that people are driven by a will to mastery (challenge) to seek optimally informative environments (curiosity) which they assimilate, in part, using schemas from other contexts (fantasy)." The three categories of challenge, fantasy, and curiosity seem to be essential to understanding the motivation to engage in game playing. While admitting that learning is a result of some game playing, specifically those games designed by educators, many teachers wish their students were half as enthused about school learning as they are about computer games designed by commercial interests. Malone (p. 359) believed that kind of excitement need not be confined to video arcades, and noted that "well-designed instructional environments, by providing high-level goals, can take advantage of a 'natural' cognitive motivation to optimize existing mental procedures."

Malone's most interesting point about the instructional design features of educational software might be the idea that those aspects of a program which make it fun may also be powerful facilitators of learning. Based on the work of cognitive learning theorists such as Piaget and Bruner, Malone (p. 335) said "if students are intrinsically motivated to learn something, they may spend more time and effort learning, feel better about what they learn, and use it more in the future."

There are other factors conducive to motivation which can be built into software and allow the curriculum designer, the commercial producer, and the teacher to control learning and attention. Atkins and Blissett (1989), working with interactive videodisc, demonstrated a high degree of involvement by students and a broad range of within-group variability in a small scale study of students learning with a videodisc. But guidelines for making a program stimulating have not been written yet because the uses of the new technologies have not been fully explored. Also, certain technical features and special effects may be applied more readily to some academic fields than others; problem-solving in the construction of a space station for an astronomy lesson is full of interesting simulation possibilities whereas learning the names of colors in Spanish is more restricted.

Experience has shown that educators usually find uses for new technologies once they are developed rather than being sufficiently ahead of the game to have uses ready when the technology becomes available, still less to participate in the development of new technologies. A second lesson from experience is that the best intentions of teachers, software writers, administrators, educational philosophers, and parents may be secondary to the intrinsic motivation discovered by the learner in an attractive, educationally relevant learning experience with some form of electronic medium.

Case Studies

Several intensive case studies of students and teachers using new technologies have been based on ethnographical and ecological theory. Other research methodologies, borrowed from sociology, have been employed by researchers attempting to understand technology-based distance education. Such studies might include field work and observation (Minnis, 1985), for example, going to a site to study the phenomenon in a natural setting and interpreting data in light of its meaning in the socio-cultural context of the participants.

Although the results of single case studies are not generalizable to the same extent as larger group studies, they have provided important baseline data. This data becomes the starting point for identifying the critical variables in interactive and distance learning. One example of this kind of intensive study was one by Clyde, Crowther, Patching, Putt and Store (1983). They investigated how auxiliary materials such as a diary or workbook are used in the classroom when students watch a program on television, and to understand the way these materials support learning.

Visual Literacy

Griffin and Whiteside (1984) described the relatively new field of visual literacy and its potential contribution to enhancing human potential. Noting that in this "information" age, when individuals are bombarded with messages, both educational and non-educational, it is essential that the educational communication process be made as efficient as possible. The authors observed that far too little is known about the efficacy or efficiency of visual communications used for instructional purposes. In the recent past, visual material was often included as "icing on the cake," or an attempt to induce an affective reaction on the part of the learner. Much of the potential instructional impact of visual material is often wasted, the authors suggested, because of several weak links in the communication process. One problem is the lack of good research which might inform instructional designers' decisions about the use of visual material. Another weak link in the process is that such decisions are often made, not by instructional designers, but by commercial interests or computer graphics experts knowing even less about how the visuals might contribute to the learning process. Griffin and Whiteside gave examples of how the success or failure of visual instructional communication was by chance rather than because of conscious design decisions. Sometimes, they said, the success instructional communication can best be explained in terms of a good match between visual ("message") characteristics and audience ("receiver") characteristics. They cited other instances in which well-designed and executed visual instructional communication failed because of "receiver" characteristics. As a general rule, learners will not be able to take advantage of the enormous potential contribution of visual materials unless they receive some training and experience in "visual literacy." Therefore, according to Griffin and Whiteside, a new psychology of visual learning must pay attention to all links in the communication process: sender, message, channel (or "medium of communication or instruction) and receiver.

Independent Learning

A strong theme of contemporary research in education is independent learning. Motivation, a cornerstone of all theories concerning with the effectiveness of learning, is found to be higher when the learner can control his own progress (O'Neill, 1987). The great advantage of present technologies, such as interactive video, is that they provide for independence and for a dynamic involvement in learning rather than the passive reception of information which characterizes traditional classrooms.

Theory and Outcomes

Many researchers have reported finding no significant difference between technology-based teaching and traditional methods of teaching. Olson (1972) offered one explanation for that outcome. Olson wondered why and how instructional methods with (what he called) different "topographies"--such as modeling, verbal teaching, or providing for the discovery of contingencies in a child's environment--can result in the same knowledge. He suggested and then provided evidence in support of his concept of equivalence of forms of instruction. Olsen said that while various methods of teaching can have different surface characteristics, for example, television or face-to-face presentation, the learner has an invariant set of cognitive processes. This implies that the intellectual outcomes observed in a classroom are not necessarily directly attributable to the instructional method used. According to Olsen, most theories related to learning in traditional classrooms apply equally well to learning by technological means, and nothing is gained by adapting the to the unique characteristics of any particular medium. For example, use of an advance organizer has been well established as a means of increasing comprehension and retention, and "it is obvious teachers should use the same tool when they are using a computer or a television."

A similar example was given by Brown, Nathenson, and Kirkup (1982), whose evaluation at the Open University indicated it is important for teachers to be clear about the objectives of a program. They said it is also important that these objectives be communicated to the student well in advance. The same would hold true whether or not the instruction is delivered using some form of instructional technology.

Research/Case Studies

A Statement on Research

A short article by Ljosa (1980) called, "Some Thoughts on the State of Research in Distance Education" questioned the degree to which literature was accumulating. Ljosa looked back to 1969, when one of the speakers at the Eighth ICCE Conference in Paris said that research would not top the list of notable achievements in the field of correspondance study. Ljosa said that, as of 1980, that statement would still hold true, for although some literature was available, research reports were still quite rare.

A comprehensive review of the literature should be of use to both those developing and providing education by electronic media, and those who receive these services. Richardson (1983) lists several major topics for a review:

1. An analysis of available telecourse packages.
2. The nature of motivation of various audiences.
3. The retention strategies which should be used.
4. Instructional strategies for audiences.
5. The logistics and costs that apply to each audience.
6. The technical training and assistance for first time users.

According to Richardson (1983), new technology does not mean we are entering unexplored territory; we must be careful not to waste time and money investigating distance learning where well established principles of general learning already apply. For example, Richardson (1983) talks about the common belief that, in predicting those who will learn most, we need to know demographics like sex, age, and socioeconomic status. Yet, she continued, "General intelligence is the best predictor of amount of learning." When general intelligence is entered into the equation, socioeconomic factors do not account for any of the variance in learning. According to Richardson (1983, p. 11), "The socioeconomic or demographic factors are useful in helping to predict who will participate, but not who will learn."

Even if research on educational technology is still in its infancy compared to other areas of educational research, tracking and categorizing publications is already a problem. Rubincam (1987, p. 165) suggested a central reference library dealing only with the topic of distance education. According to Rubincam, an initiative needs to be taken soon before the problem becomes overwhelming. As an example, Rubincam mentioned "the field of computer applications to education, which produces countless informal documents and reports, numerous books, and over 1000 journal articles per year in the English language alone."

Typical Dependent Variables and Outcomes

According to Cohen, Ebeling, and Kulik (1981), six of the most commonly measured dependent variables in distance learning research are: (1) achievement scores, (2) retention of information, (3) attitudes, (4) aptitude-achievement correlations for a given medium, (5) student attitudes, (6) course completion.

Generally, results show no great differences either across media or between media and traditional methods. For example, in a meta-analysis of 74 studies comparing visual-based instruction with traditional teaching methods (statistics from all studies were integrated), Cohen, Ebeling, and Kulik (1981) found non-significant differences in five of the six areas listed above. The one effect was for achievement with the majority of studies favoring visual learning. Yet even here the effect was small.

Teachers and other consumers might have to look long and hard for research studies finding large statistical differences favoring the use of educational technology.

Within the achievement data analysed by Cohen, Ebeling and Kulik, there was one moderate positive effect in favor of using visual-based instruction as feedback during skill acquisition. Even this moderate effect was hidden when included with other statistical data on methods of visual presentation.

Atkins and Blissett (1989), using the most advanced technology to date, videodisc, analysed engagement in learning and attention to task by pupil group and number of sessions in which the videodisc was used. The result was a greater statistical difference within groups than between groups. There is, therefore, the implication that new forms of presentation and the discovery approach of interactive programs may exploit the variability of a population rather than force performance into a mold.

Knowledge Gain/Effectiveness

According to Hughes (1988) and Zigerell (1986), the question of whether there are improvements in student performance which can be attributed to the use of instructional technology has been thoroughly researched. Both Hughes and Zigerell asserted that the results are unequivocal, with no significant improvement for interactive media over traditional techniques for students of comparable age and educational educational background. However, they noted that there is little data for learners outside the age groups of adults and high school students. Zigerell (1986, p. 28) said: "These comparisons neither prove nor disprove the inherent superiority of one instructional mode over another. All they do is confirm that a well-motivated student can learn as well through one medium or method as another provided the means chosen is employed well."

However, there is some reason to wonder to what extent the advantages of instructional technology and the advantages of more traditional forms of instruction might tend to cancel each other out if the critical variables are not identified and measured very precisely. Zigerell's way of stating that was to say that the research results cited above are a balance between what technology does better than face-to-face teaching and what it does not do as well. Zigerell said there is considerable agreement that video can motivate a student to persist because it acts as a pacing mechanism, and that it will provide a feeling of community for those who study at a distance. Yet video is not good for presenting large quantities of information which the traditional textbook will do better (Zigerell, 1986).

It is questionable whether learning gains from interactive media can be adequately measured within shorts periods of time. Even one to two years is considered a short time. However, defining learning gains is also difficult and is usually left up to the teacher or the researcher. For example, Johnson, O'Connor, and Rossing (1983-84) found no significant difference between test scores for an interactive versus an in-person population. But their achievement data was collected on only eight different class sessions. Their dependent variable was a collection of test scores on four-option multiple-choice quizzes. Other researchers might question whether a multiple-choice quiz was a sufficiently sensitive instrument to detect more than a narrow range of possible learning outcomes. Other researchers might also wonder whether the eight class-session time period was long enough to allow the two groups to become differentiated.

In a follow-up study, Denton, Clark, Rossing, and O'Connor (1984-85) assessed the instructional strategies of seven medical faculty. Sixteen observations were made of presentations using two-way television, and sixteen of the conventional live professor mode. Results showed professors using similar instructional strategies for both modes. Again, other researchers might ask whether the time frame was sufficient for different instructional strategies to emerge for the same individual. It seems likely that, for a given professor, teaching style is a set of robust and well-established behaviors, and that during initial contact with new technology, changes in strategies may be difficult to observe.

Denton, Clark, Rossing, and O'Connor found some variation in the responses of medical students to the different modes of instruction, with a preference for live presentation. These students complained that interactive television was less interesting and note-taking was harder. These authors were working with medical students who had been in classrooms for a large proportion of their lives, and who, because of intense competition and the huge amount of information to be mastered, may have been impatient with the more innovative forms of presentation.

Students at different grade levels have been found to react very differently to various types of technology-based instruction. For example, Barker (1987) found the attitudes of high school students were more positive than those of the medical students mentioned above. Complaints from the high students were different from the complaints of older students in universities and colleges. The majority of the younger students' complaints related to technical aspects of the presentation, and to the personality of the teacher. The absence of comments concerning evaluation of their own learning by the secondary level students is noteworthy: And Barker found that evaluations by the less experienced students mentioned nothing about the differences in acquisition of information by new media versus traditional means.

Behavior

Many discussions of the effectiveness of learning at a distance discuss the role of interaction, asking such questions as: Does it matter whether the student can talk to the instructor? Does reception learning differ from interactive learning to a significant degree? Several variables which might be studied in order to answer those questions include students' behavior and communication patterns in live or traditional classrooms versus classrooms receiving programs at a distance. Dohner, Zinser, Cullen & Schwartz (1985) found that the use of media did not alter the flow of interaction between student and teacher. One difference they found worth noting was that student behavior in the classroom with a "live" (as opposed to a mediated) instructor involved more solidarity and overt agreement with the teacher--a result which is not surprising.

The study of group behavior may be promising for understanding the role in interactions. In a study of groups of children using an interactive videodisc, Atkins and Blisset (1989) found greater within-group variation than between-group variation. These results cannot be easily interpreted in terms of the medium or the content, since all groups worked with the same material. The authors suggested there may be a difference in group dynamics such as the amount of time spent in discussion when problem-solving. They recommended first, that courseware designers take such behavior into account if programs are to be successful. Second, the authors suggested that it may be inappropriate to rely so much on aggregated group data in studying interactive learning. The type and level of students' interactions would seem to be a highly individual matter, affected by learning histories and personalities, preferred cognitive styles, states of health which fluctuate on a daily basis, and environmental variables.

Learner Profile

The literature in distance learning has paid an inordinate amount of attention to trying to construct a profile of the typical learner. After compiling data from a large sample and calculating means, the profile they end up constructing seems more like a chimera that is unrecognizable to administrators, instructors, or students. Concentrating so much energy on profiling the "typical" or average learner also tends to mask the tremendous variability which exists in the consumer population.

For example, Julian (1982, p. 4) found that a typical telecourse student is "female, aged 26-35, married, and working full-time." Julian also reported that "38% held at least a 4-year degree; another 33% had at least 2 years of post-secondary education." At a local level with a small viewing audience, the construction of audience profiles could be very helpful in planning. Julian (1982) also noted that the broadcast audience for community college telecourses was quite similar in demographics to those attracted to courses on campus.

However, especially at the national level, demographics should not be the only consideration. While the majority of distance learners a: ; in the age range 20-40, experience has shown that audiences in other groups can be attracted by compelling or relevant program content. For instance, Zigerell (1986) reported that vocational materials without an accompanying academic credential are being produced in greater volume and draw audiences in the over 40 age group. The same might be true of minorities and lower socioeconomic status learners, who have been consistently underrepresented among distance learners in the United States.

Current and future technologies may provide opportuntities to touch every type of learner and learning environment with relevant content at a reasonable cost. However, the more efficient, affordable and technology-based forms of distance education often sacrifice the individualization which has traditionally been one of the strengths of distance education at the postsecondary level. For example, Weingartz (1981) found that when broadcasting to large audiences: a ready-made curriculum for distance study is financially far more attractive than trying to individualize which requires greater expenditure of time, people and money .

Dropout

The problem of student attrition or dropping is a great concern in distance learning. Although many studies have been done both to understand the phenomenon and to ameliorate it, there is to date no adequate solution. Garrison (1987) claimed an adequate theory has not even be formulated. He says suggests some of the reasons may be a lack of knowledge about learning through media and a deficiency in methodology.

However, researchers may be missing the point when they address dropout as a simple question-and-answer problem. Different combinations of useful approaches might be appropriate for each institution. Some solutions seem to work better than others in particular contexts. Woodley and Parlett (1983, p. 23) at the Institute of Educational Technology, connected with the Open University presented a list of initiatives to help students stay in the program. Their work is based on more than ten years of study: Woodley and Parlett said these university measures are "relatively cheap, practical and humanitarian and . . . are aimed at improving the ratio of 'push' to 'pull' factors for its students." They suggested that during admissions, students should receive adequate counseling and have better course descriptions and sample materials, that counseling should be continual. They suggested that tuition should be raised--presumably because perceived investment of resources by a student is directly related to commitment to a course. The authors recommend that feedback to students be made as quickly as possible, that course quality be improved so student will be more motivated. They said that staff and faculty need to think more about presentation and less about course production. They recommended that a student diagnoed as unlikely to succeed should be advised against taking the courses. They said that students with large workloads and without prerequisite courses will need more advising, and that students who have trouble with a course should be allowed to extend the time of completion.

Closely associated with the problem of dropout is that of the "at-risk student." Can new technologies and distance learning be used to help them? Stone (cited in Electronic Learning, November/December 1988) pointed out that it is easier to use some machines, such as a computer, than it is to learn many of the subjects a child traditionally encounters in the classroom such as mathematics or reading. She believed that when "at-risk" students experience success by engaging the computer, they gain confidence and become empowered. Thus, motivation is increased, and a door is opened through which the teacher can reach a child.

Overview of Outcomes

Schnell and Thornton (1985) present a list of outcomes which agree with many of the studies in the literature on commitment to mediated courses and the attraction of mediated courses for students. They said the typical student in an open university media course is older than the traditional student, married, middle-class, with one or two children. Such students have often been out of school for a number of years. Even those using the mediated courses often show a preference for face-to-face classroom instruction when given the choice. Schnell and Thornton also said that the investment of time and money in a course will account for up to 5% of the variance when considering course satisfaction, other investments, and alternatives to media courses.

The most comprehensive statements on research done in distance learning have come from Schramm (1977) who has summarized a large body of experimental studies. He claims that not only do different media have similar results in terms of effective learning, but even variants of one medium over another are not significant. Schramm implied that it is overly simplistic to assume that we can simply choose the right medium for a particular learning experience.

Attitudes

Accepting New Technology

The acceptance of new technology may be simply a matter of time, especially in the field of education where change takes place slowly. Dohner, Zinser, Cullen and Schwarz (1985) indicated that user acceptance increases as consumers become more familiar, and experienced with, media. Since we live in an age in which new electronic media are being quickly introduced into all areas of our lives, we should expect increasing acceptance of interactive, distance learning technology even without any deliberate intervention to influence opinion. For example, like television, personal computers are becoming increasingly commonplace in parents' homes, together with the expertise in using it ,whether or not they are present in their children's schools or formal training is being provided. Nevertheless, it would be wrong to assume that familiarity is a necessary factor for the acceptance of distance mediated learning.

As a writer for Time magazine said in a May 22, 1989 article, "In public education, geography has long been destiny. Crippled by limited staffs and tight budgets, rural districts have often found it impossible to offer courses such as Russian and physics that are considered standard by their more cosmopolitan counterparts." She went on to say that through the wonders of satellite telecommunications, now "even small, disadvantaged schools are gaining access to the most sophisticated instruction available, and all without losing the human touch." People have long believed that rural schools are less open to change, and even where they are willing to adopt new technology, they lack many of the resources needed to bring about such change. Such beliefs have been found to be erroneous (Jordahl, 1989; Pease, 1989; Wesr, 1989). In fact, the TI-IN Network, Inc., a commercial company which have been providing educational television since the early 1980's and were the only private enterprise to receive federal money from the 1989 Star Schools grants, regard school administrators in rural public school districts as the leaders in nationwide adoption of satellite systems. (TI-IN stands for Texas Interactive Instructional Network.)

Successful Implementation

Several authors, including Nisbet (1981, p. 20) have suggested that, rather than worrying about changing the attitudes of teachers and administrators, upon whom most of the success of new technology depends, it might be more productive for educational technologists to worry about making the technology fit the existing organization of a classroom and the usual teaching strategies being employed. For example, most educators and parents have strong opinions about what a core curriculum should contain and how lessons should be taught. The introduction of radical and innovative new forms of teaching usually creates apathy at best, resistance at worst. But, (rephrasing an old cliche) it might be possible to "bring the water to the horse"--that is to design a technology-mediated curriculum which parallels the usual practices of a given classroom and teacher.

In order to understand the process of adoption, we need to go beyond attitudes and enthusiasm. Bransford (1988) maintained that the slow adoption of technology by the public sector is not due to a lack of interest. In his view, the explanation might better be sought in the areas of economics and politics. Dillon (1989) offered a concrete example of this: the importance of providing a reward system for faculty and administrators if a university telecourse is to be successfully adopted. Her study provided but one example of a common finding, that attitudes are shaped and mediated through factors not directly associated with technology itself, but rather through the ever-present dynamics of the social environment in which adoption is to take place.

Attitudes and Success

The clear indication in the literature that there is no difference in achievement between students exposed to televised instruction and face-to-face instruction (Denton, Clark, Rossing, & O'Connor, 1984; Johnson, O'Connor, & Rossing, 1984) can mask the fact that sometimes there is an unwillingness among participants to accept new technology as the alternative to traditional in-class instruction. Successful use of mediated learning seems to be directly related to the perceptions of the user not the process employed (Johnson, O'Connor, & Rossing, 1985). Their studies strongly indicated that, even when distance educators manipulate both the content and the method of delivery of the instruction, they are still dependent on what learners brings to the experience, that is, how useful they think it is to learn by interactive media. Meanwhile, learner perceptions are influenced by such variables as the distance required for an in-person experience or the number of credit hours available. Simply stated, a student is going to rate a televised program favorably if it saves them a large amount of travel time and earns them credit toward a professional qualification even if the content and presentation is poor.

Parents

Parents exert a strong influence on students' attitudes towards distance education, particularly at the elementary level. Parents' ratings of the educational benefit of new technologies are usually quite high. But the validity of these ratings is questionable. If they live in a rural area and hold to the opinion that, because of geography their children are not receiving the benefits that other children in urban areas are, they are likely to welcome innovation. Parents can easily become the target of advertising which plays on their desire to give their children the same competitive opportunities as others.

Hosie (1985) examined responses to a questionnaire given to parents in the Australian outback who had been using videocassettes of educational broadcasts because they were out of broadcast range. He found that parents were enthusiastic, but the benefits they perceived could have been either real or imagined. Some of their positive comments might have been made out of fear--if a parent suspected that a funded program would end and their children would be at a greater disadvantage than before. Hosie suggested that this psychology might apply even when programs are of poor quality, because anything is better than nothing. In today's competitive environment, many parents are anxious to use all resources, especially those (such as the computer) which promise new advantages in life. It may be easy to convince parents of learning benefits of educational technology, even if such benefits have not been empirically established.

Clearly, attitudes play an important role in the acceptance and effectiveness of mediated distance learning. The essential variables influencing attitudes range from over-optimism on the part of administrators and parents anxious to see increased learning benefits. Parents' sincere hope of obtaining long-term economic advantages for their children can even make direct learning benefits a secondary consideration.

Implications

Benefits of Satellite Learning

There are two overriding benefits of satellite interactive telecommunication which cannot be easily achieved with other systems: one relates to distribution, the other to immediacy. Distribution has two meanings: (1) the marketing or merchandising of educational material; (2) the act of broadcasting curriculum content over a defined time and geographic range to a population of consumers.

Distribution is first and foremost directly affected by cost. Cost has been noted as a major benefit of satellite communication. In 1986, the private Texas-based group, TI-IN, offered initial subscribers a rate in one-time equipment cost which was almost half that of hiring a teacher for one year (Pease, 1989). When teacher education is delivered by satellite, there are often secondary effects which temper overall cost effectiveness. Taylor (1986) reported on a South African distance education program to upgrade the skills and qualifications of primary teachers. Although the project was not cheaper than a conventional approach, it was effective in reducing the number of unqualified teachers.

When we consider the success or failure of mediated distance learning, issues of cost effectiveness and the unavailability of other options also need to be considered as well. Guthrie (1985) drew attention to the lessons to be learned from developing countries where cost is taken more seriously. He argued that cost savings in distance teacher education may not be realized if programs are on a small scale. Guthrie's article should send a strong message to federal and private sources of funding. Design, development, and the distribution of information to students involves a large initial investment; spreading resources among many small, independent groups to provide education through electronic medium may greatly impair the cost-effectiveness of distance education.

Dohner, Zinser, Cullen and Schwarz (1985) discussed the issue of immediacy--implying the absence of delay due to time, distance, or to certain individuals responsible for mediating the information sought by a student--is an obvious advantage of electronic learning. No matter what the weather, the terrain, or the location of the student, a lesson can always be received and a teacher talked to directly. Equally important, variables such as knowledge gain, extent of engagement in communication, technical quality, and user acceptance have shown good results in initial case studies.

Immediacy, however, provides the greatest benefit to one subpopulation of consumers--high-aptitude students--who with minimal intervention can quickly acquire competence with a computer-assisted course and can be given independence and control over the program. Gay (1986) found that poor learners need more structure, and suggested that not every student can stay at home and learn from a satellite broadcast. Depending on such incoming characteristics as ability, learning style, previous experience with the subject matter, students are affected differently by such factors as control over pace, amount of practice, and style of instruction. Two other authors, Gabriel and Pillai (1986) also found that exposure to some type of mediated instruction is not a "treatment" that affects all learners in the same way.

The role of immediacy and the ease of distribution of info:..ion through electronic networks will likely be defined by a larger social change. Tight (1987) predicts a development mixing distance and face-to-face education. Many more students will be served by suitable teachers if educators can be creative in combining new communications media with the established approaches of twentieth-century classroom teaching. Thus, we can expect a continuum from the low aptitude student requiring a great deal of structure, learning in a traditional classroom setting, to the highly independent student constructing his own curriculum and using an electronic network wherever and whenever he chooses.

Re-education

There are many views in the field concerning the future of technology in schools. The primary considerations have to do with projected costs, use, and student achievement. As with most projections there is no clear resolution. For example, there are many reasons why the cost of technology could either increase or decrease. However, another important question needing to be addressed is that of skills.

Davis and Shane (1986) argued that the increasing sophistication of computers, and the efficiency with which they present information will require more reading, writing, and speaking skills: "[computers] do not dispense the ability to understand or interpret" (p. 15). Furthermore, computers do not dispense the ability to understand yet. The task of devising a curriculum for teaching computer skills to both teachers and students is very difficult, simply because of the rate at which the field is advancing. Contrary to what those authors projected, one could as easily visualize a situation in which less reading and writing skills are required, where interaction with electronic media is all verbal and the learner is free to approach the task in other ways. The notion of traditional forms of reading and writing becoming redundant skills by the twenty-first century is at least novel, if not disturbing because reading and writing are inextricably linked to the notion of the literate, educated person.

Re-education does not simply mean providing user training for computers or other technology--it also means teaching learners to be autonomous and to participate in conference classes with other distance learning students. Mason (1988), working at the British Open University, used computer conferencing with up to 2000 student participants. Although individuals demonstrated both operative and figurative knowledge of educational media, they came from a tradition of receptive learning environments with rigid curricula presented at regularly scheduled times. They needed to be taught and motivated to learn on their own, at different times and at different locations, and to be part of a large student body which, unlike the students in their school class, changed more dramatically from subject area to subject.

Kelly and Shapcott (1987) suggested that re-education focusing on different motivating factors and the ability to self-direct one's own learning may be important in attracting and retaining students in open university courses. This is especially true with adult distance learners, who feature largely in the consumer population but who are not well understood in terms of attitudes and study orientations, according to Kelly and Shapcott (1987). Schell & Thornton (1985), in their empirical validation of an exchange model to explain the level of commitment students have to the goal of completing a course, indicated that students who finish the course are not necessarily more satisfied but may instead be simply more goal-orientated.

The Failure of Technology Systems

Large-scale projects involving a wide range of people in varied settings and the transmission of information through combinations of media are extremely vulnerabe to temporary or permanent breakdown. Gayeski (1989) discussed and categorized eight categories of reasons why information technologies fail: (1) technophobia; (2) lack of human contact; (3) disruption of legal boundaries or economic status; (4) lack of appropriate designs and information; (5) the unreliability of technology; (6) tasks attempted are done better by other media; (7) lack of local production ability; (8) lack of standardization.

Conclusions

What Electronic Media do Best

Zigerell, O'Rourke, and Pohrte (1980) found that students learn efficiently using television and show adequate levels of motivation and positive attitude. But like several other researchers they found no reason to point to any single characteristic of instructional media as the reason behind an increase in learning. Zigerell, O'Rourke and Pohrte (1980, p. 21) said "Most researchers further conclude that there is no combination of presentational circumstances or instructional variables which is best for all learning groups"

Williams (1978) suggested that there are behaviors and learning differences which are unique to electronic media and others which are unique to the traditional live classroom. If a task does not involve much cooperation and is low on interpersonal expression, such as information transmission, it makes little difference what medium is used. However, according to Williams (1978), negotiation and conflicts which are high on interpersonal involvement are particularly sensitive to a change from face-to-face interaction to telecommunications. The physical environment determines the psychological and social geography for the participants. Williams (1978, p. 129) concluded that "tele-education seems especially promising since educational activities are primarily for cooperative problem-solving and the transmission of information--activities which have been shown to be almost unaffected by the medium of communication used."

These examples are among the first to emerge from the research on the uses of technology in education. Answering the question, "What do electronic media do best?" will require not just more controlled, empirical research, but also a number of years of on-hands use by schools. Surely aspects of learning through media will emerge over time which were unanticipated upon their introduction.

Lessons from the Computer Debate

Cuban (1986) observed that the same critics who call for more money for classroom computers seldom say anything about the need for more teachers or budgetary increases that might allow schools to take advantage of the learning potential of the new equipment. They only recommend more money for classroom computers. Cuban (1986, p. 101) went on to say that:

> Until there is far more research, far more public debate among academics, policy makers, and practitioners....I would urge moratoria on more teaching of technical languages to students and heavy purchasing of interactive computers. Too many complex, interrelated policy issues about the teacher's role, the act of teaching, collateral learning for students, and the purposes of schooling arise to press forward without questioning or anticipating consequences.

Cuban raised an interesting question: Why do computer advocates ignore the issue of teachers and school budgets? Can they be so shortsighted or enamored of the new technology that they believe it is a panacea or a substitute for conventional means?

A few advocates might be able to justify pushing money into equipment and restricting reform to the provision of classroom computers. For example, educational philosophers such as Seymour Papert and Ivan Illich emphasized the ability of the student to direct his own learning and questioned the deeply ingrained assumption that to learn we need someone to teach us. There is also considerable evidence that while education by combinations of media is only as effective as traditional means, it is sometimes cheaper. Papert (1980) estimated that the cost of computers for the class of 2000 should represent some 5 percent of the total public expenditure on education. Additional cost related gains may be a reduction in the number of years spent in school, and the increasing of class sizes without losing out on personal attention because of an increase in students' autonomous learning.

Papert (1980) illustrated how computers allow us to move from didactic teaching to putting the child into direct contact with powerful ideas and material, even though the material is simulated by the machine. Drawing upon a long tradition of educational psychology and philosophy, Papert maintained that children's intellectual structures develop as a consequence of their interactions with a computer. Papert suggested that the newer media are unique in providing this type of learning; and the power of new media to provide a conceptual environment and stimulate growth in cognition is precisely why many advocates ask for one major step forward: Put the child in contact with the technology. Papert and other like-minded individuals suggest that technology allows for more people to be directly involved in the child's education other than the teacher; and that media brings many cultures and communities into the classroom.

The Motivated Consumer

A great deal of research in distance learning indicates the necessity of including motivation in any consideration of effectiveness. For example, Zigerell (1986) suggested that learners who are highly motivated can learn from any medium, provided it is used well. Part of the explanation lies in the large number of professionals, such as teachers, who are driven by the need for upgrading their credentials. Zigerell noted that teachers made up 30 percent of the British Open University enrollment when it started in 1971, and they have maintained a respectable proportion, accounting for some 20 percent at the time he wrote.

The Future of Media Use

In 1986, in his landmark book Teachers and Machines, Cuban made a number of predictions about the use of computers in schools. At the elementary level, he believed, computers in the near future would not occupy more than ten percent of instructional time, while this figure was set around five percent at the secondary level. In terms of integrating into, and altering classroom organization, Cuban (1986, p. 99) stated: " I predict no great breakthrough in teachers' use patterns at either level of schooling. The new technology, like its predecessors, will be tailored to fit the teacher's perspective and the tight contours of school and classroom settings." He also noted that computer enthusiasts on the staff would probably be the ones responsible for designing computer use in the classroom schedule.

Three years later, Business Week (July 17, 1989, p. 108) opened a major article on computer use in the schools with the statement that "chalk-age teachers and dull software mean many PCs serve as typewriters and flash cards." That article confirmed Cuban's predictions: computers are still a rare resource, are not used to a large extent, and are isolated in computer labs rather than in the classroom. Computers are not being used as a tool for all types of learning. Instead, they are being treated as an end in themselves, a goal without a clear justification. There is "no clear consensus about the role, value or effectiveness of computers in schools. Well thought-out goals are still lacking." After a decade of enthusiasm, Business Week reported that "Parents, school administrators, teachers, and hardware and software vendors all have their own agendas, which rarely mesh into focused eduational goals."

Cuban's prediction about computer devotees on the staff being the only ones integrating the use of computers was also on target. The Business Week article described one school which had had computers since 1981. Although the computers were in place and teachers were offered training, to date the computers had not become part of their lesson plans. Business Week (p. 110) suggested that school was typical, saying "Only a third of all public teachers have had even 10 hours of computer training--and the time is mostly spent learning to use the machine, rather than how to teach with it." The article also pointed out that the exception to this lack of interest is the small group of enthusiasts who share ideas and software between one school and another.

It seems fair to say that the adoption of some new technologies by many schools has been slow, and the pedagological value of the computer is still in dispute. One hope for a breakthrough lies in finding ways to teach with various media. Surely, if a computer or a television becomes an effective tool for a teacher, its use, and the discovery of unanticipated uses, will follow. It is also important to note that use of media in schools is not just a function of the type of machinery available or its role in facilitating learning. Training institutions and state agencies offering inservice programs may need to encourage participation of teachers and other professionals by awarding university credit or salary increment advancement (Carpenter, 1979). The fact that the teachers mentioned above were slow to use computers may be due to the fact that training was only available during their free time. The link between voluntary education in the uses of technology or incentive-based training, and the subsequent adoption of that technology by a teacher is an important research question needing to be answered.

The future use of advanced technology in the classroom is a bigger issue than just having teachers learn to apply media in their curricula. Tight (1987) points to a trend away from the strict line between those who learn at a distance and those who attend a school. Opportunities can be increased and the impact of teachers broadened if we start to think in terms of diversity and the mixing of new and traditional approaches to learning. Education in the future will no longer be associated merely with the notion of a teacher, a class of students, and a single location. But the shape that the new diversity will take, and what the impact will be on well-established social structures, is not clear.

Annotated Bibliography

Case Studies

Atkins, M. & Blissett, G. (1989). Learning activities and interactive videodisc: An exploratory study. British Journal of Educational Technology, 20 (1), 47-56.

This article described a small study on secondary students' use of interactive videodisc, including consideration of the degree to which students are engaged in learning and attend to the task. Data was analyzed using the variables of student ability group and the number of sessions in which videodisc was used. Statistical differences within groups were greater than differences between groups.

Dohner, C. W., Zinser, E., Cullen, T., & Schwarz, M. Roy. (1985). Teaching basic science and clinical medicine at a distance: An evaluation of satellite communication. Distance Education, 6 (1), 4-33.

Dohner et al. described learning in science and clinical medicine classes at the University of Washington at Seattle. Students at two remote sites could interact with their instructors using two-way audio and one-way video. The variables examined included knowledge gain, engagement in communication, technical features, and user acceptance.

Gay, G. (1986). Interaction of learner control and prior understanding in computer-assisted video instruction. Journal of Educational Psychology, 78 (3), 225-227.

Gay conducted an empirical study contrasting low-aptitude with high-aptitude students under two conditions: program-controlled and learner-controlled computer video learning. The results show the importance of aptitude and ability with material to be learned. Gay reported that students can be given more control and independence with a computer-assisted course if and only if their prior understanding is relatively high; poor learners need more structure. Prior understanding of material markedly affects performance. Therefore, Gay suggests that educators cannot assume that control over pace, amount of practice, and style of instruction mediated by a machine is equally beneficial to all learners.

Hosie, P. J. (1985). A window on the world. British Journal of Educational Technology, 16 (2), 145-163.

Since 1983, primary school children in outback areas of Australia, who are unable to receive educational broadcasts on their televisions, have been able to make use of videocassettes through a national loan program. Hosie discussed the effects of exposure to these videocassettes on students' attitudes and viewing patterns. Hosie also discussed the influence of the availability of these videocassettes on the regular school curriculum.

Denton, J. J., Clark, F. E., Rossing, R. G., & O'Connor, M. J. (1984, April). An examination of instructional strategies used with two-way television. (Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.) (ERIC Document Reproduction Service No. ED 238 407).

Johnson, G. R., O'Connor, M., & Rossing, R. (1983-84). Interactive two-way television vs. in-person teaching. Journal of Educational Technology Systems, 12 (3), 265-272.

These two articles were based on studies of two-way interactive television as it was used to to teach medical students at two separate location. The dependent variables were achievement scores and student attitudes; the independent variables were in-person vs. two-way television, instructional strategy (expository, film, role play/simulation), and content of lesson. The authors suggest that, at least for these highly motivated learners, the outcomes for students taking the course using two-way interactive television were quite comparable to outcomes for those being taught by the same instructors, live and in-person.

Kulik, J. A., Bangert, R. L., & Williams, G. W. (1983). Effects of computer-based instruction on secondary school students. Journal of Educational Psychology, 75 (1), 19-26.

Kulik, J. A., Kulik, C. C., & Cohen, P. A. (1980). Effectiveness of computer-based college teaching: A meta-analysis of findings. Review of Educational Research, 50 (4), 525-544.

The authors of both articles presented a wide range of research findings and used meta-analytic techniques to find significant results of effective computer use at the secondary and post-secondary levels.

Mason, R. (1988). Computer conferencing: a contribution to self-directed learning. British Journal of Educational Technology, 19 (1), 28-41.

This article described several examples of computer conferencing in educational settings. The author discussed several implications of computer conferencing, such as increased learner autonomy, and offered some guidelines and recommendations. The author described several experiments carried out at the Open University, where up to 2000 undergraduate students took part in a computer conferencing system.

Schell, B. H., & Thornton, J. A. (1985). A media course commitment study in a Canadian university: empirical validation of an exchange model. Distance Education, 6 (2), 209-222.

The article describes how students are attracted to an open university media course program, and examines their commitment to stay with the program for an extended time. The authors evaluate a number of typical open university marketing strategies in the light of their conclusion--that students who remain with the program are not necessarily more satisfied than those who drop out, but those who stay may simply be more goal-oriented.

Inservice Training/Introducing Technology/Implementation

Bransford, L. A. (1988) Communications technology and the public sector: Understanding the process of adoption. Telematics and Informatics, 5 (4), 431-435.

The author maintained that even though technological innovation is greeted with enthusiasm in the public sector, implementation and adoption has been slow. While the potential and value of such systems are not in dispute, Bransford explainded slow adoption in terms of economics and politics.

Carpenter, R. L. (1979, January). Closed circuit interactive television and inservice training. Exceptional Children, 289-290.

The article proposes ways in which teacher training institutions and state agencies can conduct large inservice programs using closed-circuit interactive television. The author suggests that one way to especially encourage participation would be to award university credit or salary increment advancement.

Dejoy, J. K. & Mills H. H. (1989). Criteria for evaluating interactive instructional materials for adult self-directed learners. Educational Technology, 29 (2), 39-41.

As compared to traditional face-to-face teaching, many technologies provide educators with greater flexibility in terms of time, location, content, and meeting the needs of users with different learning styles. Examples of technologies offering freedom from the tyrannies of time and space are computer-assisted instruction (CAI), and interactive video instruction (IVI). The authors point out, however, that instructional systems are completely dependent on the quality of the instructional materials if effective learning is to result. This article presents a list of evaluation criteria for self-instructional materials for adult learners. These criteria were developed and have been used in the Personal Adult Learning Lab at the University of Georgia's Center for Continuing Education.

Dillon, C. (1989). Faculty rewards and instructional telecommunications: A view from the telecourse faculty. The American Journal of Distance Education, 3 (2), 35-43.

The author suggested that provision of an appropriate reward system can go a long way toward insuring the success of an innovation. She also provided an analysis of faculty and administrator perceptions of reward systems as they relate to the university telecourse.

Hart, A. (1988). Educational media: Innovation and evaluation. Journal of Educational Television, 14 (3), 201-212.

This article explored a multi-media package, containing two videocassettes and a teacher's handbook. This instructional package was developed in the United Kingdom. It was designed for nursing educators and those involved in patient care, and intended to promote innovation in clinical and educational practice. Users were followed up to find out who used the package, in what contexts it was used, how that use was organized, and how effective it was for learners. Hart argued for the importance of context for effective learning, based on theory as well as practice.

Hedberg, J. G. (1988). Marketing continuing education programmes: Meeting the needs of professionals. Educational Media International, 25 (4), 235-241.

This article presented results of a major survey of both institutions and individual users regarding continuing professional education programs. The author discusses the potential for distance learning and mixed mode approaches to meet the need for new skills not covered in initial training.

Hon, D. (1988). A personal approach to the design of interactive media. British Journal of Educational Technology, 19 (3), 227-228.

Hon, a famous instructional designer, provided an unusual and insightful definition of learning tasks, interactive media systems, and their evaluation, to serve as a short guide for other instructional designers.

Laurillard, D. (1986). Introducing computer-based learning. Open Learning, 1 (1), 10-12.

Laurillard, of the Open University Institute of Educational Technology, offered a framework for incorporating computer-based learning into educational programs. According to Laurillard, one advantage of computer-based learning is facilitating collaboration between computer manufacturers, professional trainers and teachers, national agencies and institutions.

Taylor, R. P. (Ed.) (1980). The computer in the school: Tutor, tool, tutee. New York: Teachers College Press.

As the title suggests, the author describes three ways of using the computer in education. The book is grounded in the writings of five leading authorities in this field: Bork, Dwyer, Luehrmann, Papert, and Suppes.

Wade, R. K. (1984-85). What makes a difference in inservice teacher education? A meta-analysis of research. Educational Leadership, 42 (4), 48-54.

The meta-analysis reported here was based on 91 studies linking inservice training of teachers with student outcomes. The most effective methods were found to be: (1) observation of actual classroom practices, (2) micro teaching, (3) video/audio feedback, and (4) practice.

Wright, T. (1988). An experiment in staff development at a distance. Open Learning, 3 (1).

The author, a staff tutor in the Open University, described a resource pack designed for tutor-counselors to understand their tutorial practice. The article is useful for all tutors involved in open learning courses.

Research: Methods and Issues/Evaluation

Beare, P. L. (1989). The comparative effectiveness of videotape, audiotape, and telelecture in delivering continuing teacher education. The American Journal of Distance Education, 3 (2), 57-66.

In this article, Beare reported finding that the lack of individual opportunity to interact on a daily basis with an instructor did not reduce the degree of learning as measured by course examinations. Beare also found no significant difference between those who heard the lecture once and those who had an opportunity to hear it repeatedly on tape. Distance learners found the course as stimulating as those who received the live presentation. Those who enrolled voluntarily were more likely to enroll in another video course in the future.

Clark, R. E. & Salomon, G. (1986). Media in teaching. In Merlin C. Wittrock (Ed.) Handbook of Research on Teaching: Third Edition. (pp. 464-478). New York: Macmillan Publishing Company.

This was an outstanding chapter by two leading figures in the field of technology in education. They discussed a sizable body of research literature, particularly research making comparisons among different media. The section at the end, entitled "Lessons for Future Research" was excellent.

Cookson, P. S. (1989). Research on learners and learning in distance education: A review. The American Journal of Distance Education, 3 (2), 22-34.

This article included a comprehensive review of empirical studies on learners and learning in distance education drawn from literature cited in ERIC, Dissertation Abstracts International, The Social Sciences Citation Index, and Teaching at a Distance. The important areas identified by the author included specific distance education methods, student outcomes, dropout, student profiles and institutional factors.

Daningburg, S. & Schmid, R. F. (1988). Educational Television Evaluation: The impact of methodology on validity and learning. Journal of Educational Television, 14 (3), 177-191.

Daningsburg and Schmid provided an analysis of the process of evaluating educational television, using the Programme Evaluation Analysis Computer System as an example. That model uses: (1) the nature of the evaluation question, (2) the nature of the program and, (3) the attention of the learner as the essential variables.

Garrison, D. R. (1987). Researching dropout in distance education. Distance Education, 8 (1), 95-101.

Garrison provided some useful suggestions on how to approach research on one of the major problems faced in postsecondary distance education--attrition or dropping out.

Melton, R. F. & Zimmer, R. S. (1987). Multi-perspective illumination. British Journal of Educational Technology, 18 (2), 111-120.

The authors, who work in the Institute of Educational Technology at the Open University, described an innovative, qualitative approach to studying the effects of technology. In their evaluation model, a central figure, called an illuminator, helps all participants to identify and understand issues important to them.

Minnis, J. R. (1985). Ethnography, case study, grounded theory, and distance education research. Distance Education, 6 (2), 189-198.

Minnis argued that naturalistic studies at the grassroots level will be necessary if concepts and theories in distance education are to be built. This article provided good advice on how to use a case study approach.

Sheingold, K., Kane, J. H., & Endreweit, M. E. (1983). Microcomputer use in schools: Developing a research agenda. Harvard Educational Review, 53 (4), 412-432.

This article by Karen Sheingold and other researchers at Bank Street College of Education has been popular and is frequently-cited. It described three case studies and recommended six areas of investigation, notably, those of integration into elementary classrooms and curricula, and the preparation of teachers. They urged the case study as a starting point in research.

Weingartz, M. (1981). ZIFF research on distance education. Distance Education, 2 (2), 240-248.

ZIFF is the research unit of the well-established German Fernuniversitat. The Germans tend to be more conservative than Americans in what they think should be researched. They put forward a strong argument for using general educational research findings from the past and applying them to questions about education through technology.

Theory

Cohen, V. B. (1983). Criteria for the evaluation of microcomputer courseware. Educational Technology, 23 (1), 9-14.

Cohen presented a general conceptual framework on the instructional design features of software. This article was a useful information resource, especially for those needing to evaluate computer materials for instruction.

Dodds, A. E., Lawrence, J. A., and Guiton, Patrick de C. (1984). University students' perceptions of influences on external studies. Distance Education, 5(2), 174-184.

Dodds et al. used a traditional questionnaire and a unusual open-ended response format to present a foundational paper. Students list the advantages and disadvantages of external and on-campus course work, providing base-line data on contextual frames and constraints to distance learning.

Duchastel, P., Brien, R., & Imbeau, J. (1988-89). Models of learning in ICAI. Journal of Educational Technology Systems, 17 (2), 165-172.

Duchastel et al described Intelligent Computer-Assisted Instruction (ICAI) as a development in the theory and practice of computer applications to education and training. The importance of this approach lies in its flexibility and its capacity for helping users break away from traditional receptive learning. The authors demonstrated how the existing technology has moved far ahead of our knowledge of learning and instruction.

Malone, T. W. (1981). Toward a theory of intrinsically motivation instruction. Cognitive Science, 4, 333-369.

Malone, T. W. (1980). What makes things fun to learn: A study of intrinsically motivating computer games. Palo Alto, CA: Xerox Palo Alto Research Center. New York: Simon and Schuster.

Malone presented a stimulating article and book examining why computer games are fun rather than simply educational. He developed a theory of intrinsically motivating instruction based on the cognitive characteristics of challenge, fantasy, and curiosity. The theory is important because it uncovers a deep level structure to learning through technology, and thus provides a possible model for explaining the successes and failures of distance learning.

Moore, M. G. (1973). Toward a theory of independent learning and teaching. Journal of Higher Education, 34 (12), 661-679.

This article represented an early attempt by a distinguished author to establish the critical characteristics of the autonomous learner, the nontraditional teacher at a distance, and the communication system which links both together. The concepts explored were based on an extensive review of over two thousand items of literature concerned with indeoendent learning and teaching.

Papert, S. (1980). Mindstorms. New York: Basic Books.
This was landmark book, applying Piagetian theory to the te-.ning and learning potentialities of advanced technology. This has become one of the most widely-cited works in the area of computers in education. It is essential reading, espe:ially for those interested in the teaching of mathematics, the changing nature of the school environment due to the introduction of technology, and the correct and incorrect uses of computers for teaching.

Perraton, H. (1987, November). Theories, generalization and practice in distance education. Open Learning, 3-12.
Perraton emphasized the importance of developing an adequate theory to help with the practice of distance education. Rather than a single, comprehensive theory, he suggested it may be more prudent to develop and test examine several different theoretical models. The article made some suggestions about the kinds of theory which may be useful and the kinds of generalizations which can already be made.

White, M. A. (1983). Toward a psychology of electronic learning. In M. A. White (Ed.). The Future of Electronic Learning. Princeton: Lawrence Erlbaum Associates.
This was one of the best chapters from a comprehensive book by Mary Alice White, a well-respected scholar in this field. To some degree contradicts the position that a new theory for distance learning can be built on traditional models. She calls for a new psychology of electronic learning, including the nature of imagery, visual literacy, peer involvement, and entertainment.

Wiesner, P. (1983). Some observations on telecourse research and practice. Adult Education Quarterly, 33 (4), 215-221.
Weisner pointed to the lack of theory in distance education, and argued that the literature has focused more on the technology than on the learner. Wiesner suggested that one reason British Open University staff have made some important headway toward developing theories is that they have always looked at the entire delivery system, focusing on such issues as how to support the learner.

Changes

Bushby, P. A. (1986). Computers in the classroom: Educational process and higher order thinking. EDUCOM Bulletin, 21 (1), 15-17.
In this article, the author explored a three-way relationship between the process of education, the rate of information expansion, and the availability of computer technology.

Davies, I. K. & Shane, H. G. (1986). Educational Implications of Microelectronic Networks. In 85th yearbook of the National Society for the Study of Education: Microcomputers and Education. (pps. 1-21). Chicago: University of Chicago Press.
This chapter includes some controversial but thought-stimulating ideas and predictions. Davies and Shane provided some valuable insights into the direction that computer usage might take in the future, particularly toward greater use of computer networking. The authors also provided a description of historical antecedents, and of the social and educational changes which characterize our age.

Jordahl, G. (1989). Communications satellites: A rural response to the tyranny of distance. Educational Technology, 29 (2), 34-38.
Jordahl asserts that rural areas are emerging as the settings which may benefit to the greatest degree from instructional applications of communications technologies. The article

gives an overview of several current satellite-based education systems, including Midlands Consortium, and assess the type of role they might play in rural education.

Tight, M. (1987). Mixing distance and face-to-face higher education. Open Learning, 2 (1), 14-18.

The author pointed to a trend away from the strict separation between those who learn at a distance and those who attend a school. Opportunities can be increased and the impact of teachers broadened if we start to think in terms of diversity and mixing of new and traditional approaches to learning.

International Developments

Dunnett, C. (1988). Communications technology in distance education: Economics, equity, and change. Educational Media International, 25 (3), 154-162.

The author, a senior advisor to the State Education Department in South Australia, provides a comprehensive view of the methods and technologies used in South Australia for a number of forms of distance education, and illustrates the connections to economic situations and social impact. Economic considerations were seen as constraining the immediate needs of the disadvantaged.

Guthrie, G. (1985). Current research in developing countries: Teacher credentialling and distance education. Teaching and Teacher Education, 1 (1), 81-90.

The author addressed the important issues of teacher credentials and the cost-effectiveness of distance education. Cost is taken much more seriously in developing countries. He argues that cost savings in distance teacher education may not be realized if programs are on a small scale.

Holmberg, B. (1983). Establishing distance education as a university discipline--seven years of ZIFF research in Hagen. Higher Education in Europe, 8(3), 46-55.

In this article, one of many books and articles by this author, Holmberg traced the history of the Zentrales Institut fuer Fernstudienforschung (ZIFF) which is a research institute for basic and applied research in distance education. This article provided useful guidelines for new agencies and proposed future directions.

Karnik, K. (1981, September). Developmental television in India. Educational Broadcasting International, 131-135.

A good example of how research outcomes are applied directly to expansion and network design of television broadcasting in a developing country.

McCormick, R. (1985). Student's views on study at the radio and television universities in China: An investigation in one local centre. British Journal of Educational Technology, 16 (2), 84-100.

Students being exposed to new distance learning material at the Radio and Television Universities in China (RTVU) gave interviews on study and media, especially self-study and media design, and provide an interesting comparison with Western opinion.

Taylor, D. C. (1983). The cost effectiveness of teacher upgrading by distance teaching in Southern Africa. International Journal of Educational Development, 3, 19-31.

Focusing on cost effectiveness issues, Taylor describes two inservice distance education programs to upgrade primary teachers skills and qualifications. Taylor reported all major aspects of the budget and concluded that, although the project was not cheaper than a conventional approach, it was quite effective in reducing the number of unqualified teachers.

Social Issues

Bork, A. (1988). Ethical issues associated with the use of interactive technology in learning environments. Journal of Research on Computing in Education, 21 (2), 121-128.

Bork examined (1) general social, moral, and ethical issues associated with computers in education; (2) ethical issues for the development of learning materials and, (3) how the computer could be used as a medium for ethical and moral education.

Leirman, W. & Kulich, J. (1987). Adult education and the challenge of the 1990s. London: Croom Helm.

This book was comprised of a series of 14 papers commissioned for the 1986 Adult Education Conference in Leuven, Belgium. The authors of the 14 papers represented a number of different countries with a variety of experiential backgrounds. The book was designed to raise social consciousness and make suggestions concerning how adult educators might address issues such as unemployment, the environment, and international negotiation and peacemaking.

Maxcy, S. J. (1989). Computer-directed learning and the problem of community. International Journal of Instructional Media, 16 (2), 127-135.

Maxcy looked at three major questions which have arisen due to the impact of computer/telephone instruction upon teachers and students, focusing on change, attitude, and differences. The article explained how important variables historically tied to education change along the following lines: (1) the shift from a teacher dominated group to a learner community; (2) traditional text becoming more hermeneutical in meaning; and, (3) the altered self-concept of teachers and students using technology.

Richardson, P. L. (1983). Issues in television-centered instruction for adults. Journal of Instructional Development, 6 (3), 6-13.

Richardson described five important approaches to research in an insightful article which follows the trends which have resulted in the boom in learning through technology. She focuses on the adult population.

Roberts, J. (Ed.). (1988, November-December). Technology and the at-risk student. Electronic Learning, 35-49.

Nine prominent educators and national policy makers at the Electronic Learning Annual Technology Leadership Conference shared excellent insights and opinions on how technology can function as an intervention tool in helping the disadvantaged.

Shao, M., Carey, J., & Ehrlich, E. (1989, July 17). Computers in school: A lose-? Or a lost opportunity? Business Week, 108-110.

This article was a short, yet comprehensive, accurate and critical account of computers in schools, highlighting the training of personnel, curriculum development, and marketing of educational materials.

Woodley, A. & Parlett, M. (1983). Student drop-out. Teaching at a Distance, 24, 22-23.

Many of the issues surrounding student attrition were presented in a question-and-answer format by two leading educators in the open university system who have had considerable experience in the field.

Learning Styles

Bates, A. W. (1988). Television, learning and distance education. Journal of Educational Television, 14 (3), 213-225.

Bates headed the Open University's Audio-Visual Media Research Group for many years and is often cited in the literature on distance education. In this article, he linked distinct features of television presentation with individual differences in learning style, and explained how understanding such links may be vital for justifying the use of new technology in education.

James, A. (1984). Age-group differences in the psychological well-being and academic attainment of distance learners. Distance Education, 5 (2), 200-214.

James reported findings from a study with a representative sample of British Open University distance learners ranging from the under 30's to the over 40's. The dependent variables included psychological well-being and academic attainment. James found that although the older age groups do not perform as well as the younger ones in end-of-session, timed examinations, they tend to be better organized, more highly motivated, and more work-satisfied.

Kelly, M. & Shapcott, M. (1987). Towards understanding adult distance learners. Open Learning, 2 (2), 3-10.

The subpopulation distinguished as adult distance learners feature largely in the consumer population being targeted by educators and technology companies. Those who return to study, and choose to do so at a distance, are not well understood, according to these authors, who also look at attitudes and study orientations.

Administration

Becker, H. J. (1983-83). School uses of microcomputers: Reports from a national survey. Baltimore: Johns Hopkins University.

This article on the state of computing in the schools of the United States is cited frequently by other authors. Becker covers a number of areas ranging from applications and subject matter for the computer to social and ethical questions of class and gender.

Pepper, D. & Dunnett, C. (1987). Pharmacy or physician?: Central support for educational technology in South Australian schools. Programmed Learning and Educational Technology, 24 (1), 24-31.

Pepper and Dunnett described the need for a central body responsible for research, development, implementation and evaluation of communications technology. This article can serve as an introduction into all areas of educational technology covering everything from state-of-the-art machinery to inservice training to direct school services.

General Reading/Comprehensive Studies

Bruder, I. (1989, April). Distance learning: What's holding back this boundless delivery system? Electronic Learning, 30-35.

This cover story article identified and discussed a number of barriers slowing the growth of distance learning, including problems of certification and accreditation, and the development of partnerships.

Cohen, P. A., Ebeling, B. J. & Kulik, J. A. (1981). A meta-analysis of outcome studies of visual-based instruction. ECTJ, 29 (1), 26-36.

The authors perform a statistical integration of findings from 74 studies of visual-based college teaching, comparing different forms of instruction, attitudes, and aptitudes. Cohen et al. reported, for example, that in the typical study, students learned only slightly more from visual-based instruction than from conventional teaching.

Gray, R. A. (1988). Educational technology use in distance education: Historical review and future trends. Educational Technology, 29 (5), 38-42.

The article looks back at the history of educational technology and looks forward to its potential uses, using examples from the British Open University.

Holmberg, B. (1986). Growth and structure of distance education. London: Croom Helm.

A distinguished author described the history, educational principles, issues and theories associated with the complex and speedy growth of the field of distance education. Although sometimes erratic in organization, the book provided a spectrum of important ideas for those who wish to explore.

Keegan, D. (1986). The foundations of distance education. London: Croom Helm.

Keegan developed what has been called the first 'bible' for the field of technology and education. This is an extensive work, providing a valuable introduction to both teachers and students. The book contains, among other things a review of the literature, an analysis of the research, and a discussion of theories.

Lawton, J. & Gerschner, V. T. (1982). A review of the literature on attitudes towards computers and computerized instruction. Journal of Research and Development in Education, 16 (1), 50-55.

The authors presented a review of empirical studies in the literature which describe children's attitudes towards computers and computerized instruction. This paper was short, organized under interesting headings such as "computer languages" and "consideration of people," and easy to read.

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. Washington, DC: U. S. Government Printing Office.

National Science Board Commission of Precollege Education in Mathematics, Science, and Technology. (1983). Educating Americans for the 21st century: A report to the American People and the National Science Board. Washington, D.C.: Author.

These two well-known reports called for change and reform in the field of education in order to prepare for the future. Both reports asked about the role of technology in schools, such as having computer science as a basic course on the high school curriculum, and discussing social issues of economics, gender and minority issues. They provided an important framework of values and opinions.

Neilson, D. P., Pickering, J. A. & Vella, C. A. (1989). Technology and special needs: A survey of current U.K. research. British Journal of Educational Technology, 20 (1), 57-60.

Neilson et al. reported responses by researchers to a short questionnaire on technology and special needs. The respondents were all involved in research and development of systems or devices for special needs clients. The authors observed that one of the great advantages for researchers today is access to a database, so that the old problem of reinventing the wheel can be avoided. An expert can seek a general solution to a special needs problem by looking at previously researched topics and then refine it to the particular context in which it is required.

Sleeman, D., & Brown, J. S. (1982). Intelligent tutoring systems. New York: Academic Press.

The authors reviewed some of the educational applications of artificial intelligence through a series of reports, some of the contributors being either developers or users of AI systems.

Smith, P. & Kelly, M. (1987). Distance education and the mainstream. London: Croom Helm.

This book is a collection of essays by a number of leading Australian authors and other international figures. The main thrust of the book is the demonstration that distance education

need not be considered a strange new animal anymore, nor necessarily considered a separate discipline. Learning through technology at a remote site is converging with the mainstream life of the university campus.

U.S. Congress, Office of Technology Assessment (1988). Power on! New tools for teaching and learning. OTA-SET-379, Washington, D.C.: U.S. Government Printing Office.

The House Committee on Education and Labor, and the Subcommittee on Select Education requested the Office of Technology Assessment to do a study illustrating the potential of new interactive technologies for improving learning. The result is this large, comprehensive and well-presented book complied by an eclectic and expert panel. Areas covered include cost-effectiveness, the impact of technology on learning, the teacher's role, software, research, and the future of instruction.

Withrow, F. B. (Ed.). (1989). To support the learner: A collection of essays on the applications of technology in education. Office of Educational Research and Improvement, United States Department of Education.

The intention of this book was to communicate current information about innovative, Federally funded projects to librarians, technologists, elementary and secondary educators, curriculum planners and decision-makers at local and state education agencies. The essays were organized under the following four headings: What does the medium do to the message? How does the medium effect learning? How does technology support the disciplines? and How do schools organize to use technology?

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V. SUMMARY AND CONCLUSIONS

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The following section brings together the investigations undertaken or sponsored by the Midlands Consortium Research and Evaluation Center in order to draw some conclusions about the immediate and long-term worth of Midlands Consortium's contribution to the Star Schools Project.

Building technological capacity

Midlands Consortium Star Schools Project was designed to serve several different audiences or clients. One of its missions was to bring small rural schools in economically disadvantaged or geographically isolated areas into the information age by providing them with equipment necessary to participate in satellite instruction. In the first year, 133 districts in the three states of Oklahoma, Kansas and Mississippi, with an estimated total of 12,702 school personnel and 156,707 students were potentially affected by Midlands Consortium downlink grants, including a total of 40,141 students eligible for Chapter 1 services, 92,243 eligible for free or reduced price lunches, and 55,518 racial/ethnic minority students. In Oklahoma, the size of these districts ranged from Erick with 14 staff and 44 students to Lawton with 2,218 staff and 17,699 students. In Mississippi, districts ranged in size from Carroll with 15 staff members and 180 students, to Picayune with 480 staff and 3,939 students. In Kansas, the size of 47 school districts receiving downlink grants ranged from two districts with 15 staff members and 87 to 90 students, to Anthony-Harper with 82 staff members and 1,098 students. (More information about equipment grants is found in other sections of the Midlands Consortium final report.)

Providing educational opportunities to minority students

Another mission was to provide educational opportunities to racial/ethnic minority students, and/or high ability students who are disadvantaged by attending small rural schools that do not offer advanced classes or foreign languages. One way of addressing this goal was by providing downlink grants for equipment to districts where these students attend school (see **Tables 1-6 in the Evaluation Section**). Once the necessary equipment was in place, another way of addressing the goal of serving students was by providing instruction by satellite in advanced science or mathematics, and in three foreign languages, to students who would not otherwise have been able to take those subjects. In Kansas, most districts began by subscribing to the Spanish I course telecast from Kansas State University. But in Oklahoma and Mississippi, many districts subscribed to a greater variety of courses (see **Tables 1 and 3 in the Evaluation Section**).

In Mississippi, the percent of minority students per course varied from 14% to 90% (see **Table 9 in the Evaluation Section**), the percent of racial/ethnic minority students in the advanced mathematics and science satellite courses ranged from 20% to 88%, and the percent of female enrollment in those courses ranged from 52% to 71%. Information on parents' educational levels was collected to give some indication of the socio-economic levels of satellite students' families. The courses varied widely in this regard. In one course, 70% of the fathers and 55% of the mothers were college graduates, in other courses as few as 13-14% of the parents had college degrees. Compared to the average across courses, there was a tendency for a larger percent of students in the advanced mathematics and science courses to have parents who were college graduates.

In all 14 states represented in the research samples, the ethnic/racial composition of satellite classes sometimes differed from that of conventional classes in the same subject areas (see **Tables 1-2 in the Research Section**). For example, 65% of the Calculus by Satellite students were white, while 100% of the students in conventional calculus courses were white; 79% of the Physics by Satellite students were white, while 100% of the conventional physics students were white. Across all courses, a chi-square analysis revealed no significant difference between the ethnic/racial composition of the satellite and conventional research samples. But within individual courses, there is considerable evidence that satellite instruction reached substantial numbers of minority students who could not have taken the same courses otherwise.

Recruitment of the research samples

Every school subscribing to a Midlands Consortium course by satellite was contacted in August or September 1989 and asked to participate in the research investigations. Separate letters were addressed to superintendents, principals and teachers. Those schools who responded positively were asked if they were teaching any of the same subjects with conventional methods--a local teacher, no regularly-scheduled satellite telecasts. Those teachers (henceforth referred to as "conventional teachers") were then contacted and invited to participate. The purpose of recruiting conventional and satellite classes in the same schools was to make sure the conventional students did not have school environmental, economic or geographical advantages over the satellite students that might influence the research findings. The great majority of the schools taking courses by satellite are either small schools in rural areas or larger consolidated schools in rural areas. Since satellite courses are the only way many of these schools can offer advanced placement chemistry, physics, calculus, German II or Russian courses, it was not always possible to find perfectly comparable classes. Only one of the advanced placement subjects could be included in the testing phase of this research, and the satellite students did better on that examination. The other subject areas included in the testing phase of this research were not advanced placement, so the satellite students had no apparent advantage over the conventional students in terms of course content.

Comparing the satellite and conventional samples

Educators sometimes wonder if courses by satellite attract a different mix of students than conventional courses in the same subjects at comparable schools. At the beginning of each course, data were collected from students in each class section participating in the research investigations on various student characteristics including: incoming grade point averages and self-rated academic ability (typical grades, class rank), racial/ethnic group, gender, and parents' educational level, type of motivation for taking the course, persons who encouraged them to take the course, whether English is the primary language spoken in the home, and typical attributions for success or failure in a course. The following statistics describe students who participated in this study, not the total population of Midlands Consortium course by satellite students.

In the satellite sample, 4% or 55 students came from homes where English was not the primary language spoken, while only 2% or 29 of the conventional students came from such homes. However, there was no significant difference between the satellite sample and the conventional sample in the proportion of students from homes where English was the only language, with a chi-square of 7.14 ($p > .13$). Eight of the satellite students from non-English speaking homes were in the Spanish class, 17 in Basic English and Reading and 16 in German I; seven conventional students were taking Spanish, six Economics, eight Basic English and Reading, and two German I. **Table 4** in the **Research Section** provides a comparison of the percentages of students from homes where English is the primary language for all courses in both the satellite and conventional delivery treatment groups. The satellite Basic English and Reading course had over 10% of its students coming from homes where English was not the primary language, while only 5% of the conventional students came from such homes.

Table 5 in the **Research Section** summarizes the data on typical grades reported by satellite and conventional students. In this sample, students in the satellite courses reported receiving higher grades in prior courses than students in the conventional classes. As **Table 6** in the **Research Section** indicates: 39% of the satellite and 24% of the conventional students said they were "among the best" in their class; 29% of the satellite and 43% of the conventional said "average"; less than 3% of the satellite and 7% of the conventional students said their rank was "below average." There was a significant difference between the typical grades of the satellite sample and the conventional sample, with a chi-square of 160.84 ($p > .01$). This confirmed the widespread impression that students coming into the satellite courses had slightly higher grade averages than those in the conventional courses.

Students were asked why they took that particular course, and the differences in motivation between the satellite and conventional groups were rather striking as well as being statistically significant, with a chi square of 321.44 ($p < .01$). For example, 24% of the satellite students but only 9% of the conventional students said they were intrinsically motivated--"very interested in the subject." An external or extrinsic motivation was chosen by 14% of the satellite and 42% of the conventional students, saying "Someone made me take it. It was required." "To prepare for college or a career" was the reason chosen by 45% of the satellite and 37% of the conventional students. "There was no other course I wanted to take," was chosen by 5.3% of the satellite and 4.8% of the conventional students. **Table 7 in the Research Section** summarizes students' responses concerning their motivations for taking the course.

As **Table 8** in the **Research Section** indicates, there were some observed differences between satellite and conventional students on the question of who was most responsible for their taking the course. "No one, I decided on my own" was chosen by 58% of the satellite and 46% of the conventional students. "My parents or other family members" was the reason chosen by 5.4% of the satellite and 3.4% of the conventional students. "A school administrator or guidance counselor" was chosen by 23% of the satellite and 43% of the conventional students. "A teacher" was chosen by 9% of the satellite and 4% of the conventional students. "Other students" was the answer chosen by 3.8% of the satellite and 3.5% of the conventional students. The biggest difference between the satellite and conventional groups was in the third category, with almost twice as many conventional students saying a guidance counselor or administrator had encouraged them to take that particular course. The differences between the satellite and conventional groups were statistically significant, with a chi square of 129.47 ($p < .01$). One possible explanation might be that conventional students were taking courses which were required or which they were urged or expected to take; while satellite students were taking the courses as electives, by their own choice.

One item administered early in the academic year asked students "When you do really well in a course, which of the following explanations do you usually give?" There was a slight tendency for satellite students to give more internal attributions for success (chi-square = 14.77, $p < .01$), namely: "You worked hard," and "Your are good in that subject." There was no significant difference between satellite and conventional students in their attributions when they do poorly in a course (chi-square = 1.9, $p > .75$). There was a slightly greater tendency for satellite students to disagree that luck is more important than hard work in success (chi-square = 13.24, $p > .01$). **Tables 9-11** in the **Research Section** summarize the attribution data for the satellite and conventional students. Over 80% in each group indicated that success is due to hard work rather than luck.

Providing educational opportunities to students "at-risk"

One of the major purposes of the Star Schools legislation was to extend new educational opportunities to students "at-risk." The Midlands Consortium Research and Evaluation Center took several approaches to answering questions as to whether Midlands Consortium fulfilled its mission of serving students "at-risk." As part of the evaluation program, data were collected at the district, school building and class levels concerning the proportion of students who were behind a year or more in reading or mathematics and the proportion of students eligible to receive Chapter 1 services, and that information is reported on **Table 14** in the **Evaluation Section**.

One indication that school professionals have found satellite instruction appropriate for students at all levels of achievement came from Mississippi evaluation data. As **Table 13** in the **Evaluation Section** indicates, district superintendents expressed very little dissatisfaction with courses by satellite, and neither degree of underachievement in their districts, extent of economic disadvantage, nor size of district in terms of enrollment made any discernable difference in their perceptions. Eighty-two percent were satisfied with the level of difficulty, 93% with the content, 98% with how the satellite courses fit into their curricula, 85% with the amount of knowledge their students were gaining (only one person was dissatisfied). When building principals were surveyed (see **Table 12** in the **Evaluation Section**), cross-tabulations of school demographic characteristics with items assessing satisfaction with courses by satellite showed no evidence that satellite instruction is inappropriate for schools with a high proportion of students who receive Chapter 1 services, or who are a year or more behind in reading or math.

Is satellite instruction appropriate for students "at-risk"?

Research on post-secondary distance education had long indicated that adult students who are highly motivated and have good study skills have no trouble learning at a distance, but researchers had not provided much information about less motivated or academically-talented students at the secondary level. Based on a review by Brophy (1988, p. 256), one would predict a gloomy future for technology-based distance education for low achieving students, because according to this well-known authority on motivation and learning, low-achieving students "need more structuring from their teachers, more active instruction and feedback, more redundancy and review, and smaller steps with higher success rates." Brophy (p. 235) also said the key to achievement gains by such students is "maximizing the time that they spend being actively instructed or supervised by their teachers." Brophy said teachers must carry the content to students personally. He took a dim view of individualized instruction, saying it "demands a combination of functional literary direction-following skills, independent learning skills and habits of sustained concentration or motivation that is almost non-existent in the primary grades and is likely to be seen only in a small minority of students in the intermediate and secondary grades." Furthermore, he said, low socio-economic and low-achieving students are lower in academic self-confidence and higher in anxiety and alienation, and are more likely to require warmth and support. However, Brophy did not allow for the possibility that instruction of the very kind he thought was necessary for students "at-risk" might be delivered by satellite.

Although evaluation data were collected only in Mississippi, findings from the multi-state research studies indicated that many of the evaluation results are generalizable to other states. **Figure 4** in the **Evaluation Section** shows that compared to the other nine courses, Course 1 included a larger percentage of students who said they were average or below-average rank in their graduating class. **Figure 6** in the **Evaluation Section** shows that, compared to the other satellite courses, a smaller percentage of students in Course 1 said they were planning to go to college. For these and other reasons, students in Course 1 could be considered more "at-risk" than those in the other courses. Nevertheless, students in Course 1 perceived the learning environment to be highly supportive, providing them with successful experiences, positive reinforcement, worthwhile practice opportunities and high success rates. Students who were low in academic self-confidence were made to feel quite comfortable about calling the instructor(s), especially as compared to other satellite courses where students were far more confident about their abilities but less confident about interacting by phone. This was the only one of the ten courses evaluated in which students expected to get a higher grade than they usually get. The computer-assisted instruction component of this course was very well received. Compared to the other satellite courses, students in this class were statistically more likely to say they preferred instruction by satellite to a regular class (which constitutes a rousing endorsement) and that the broadcasts made the class more interesting. Looking specifically at the evaluation results for Course 1 provides one type of evidence that Midlands Consortium did succeed in reaching "at-risk" students with instruction to meet their needs, and that they responded well to it.

Does satellite instruction differentially benefit or penalize students with particular learning styles or individual characteristics?

Another type of investigation of the effectiveness of satellite as compared to conventional instruction was incorporated into the Midlands Consortium research program. The purpose of this investigation was to determine whether satellite courses were effective for students who were average or below-average in prior achievement or academic motivation. Some administrators considering satellite instruction had voiced that concern in conversations with course producers, and there had been no research to confirm or refute it. As part of the Midlands Consortium research program, students answered survey questions on an instrument developed to assess "orientation toward studying," which included learning styles, levels of cognitive processing, types of motivation and study behaviors. (More complete description of the four orientations to studying may be found in the **Research Section.**) For purposes of this particular investigation, "at-risk" status was defined in terms of low prior achievement, an absence of motivation or interest in schoolwork, and a tendency to think simplistically and invest little time or effort in schoolwork. Students with those characteristics in a particular learning context were said to have a "Non-Academic Orientation." An analysis of variance, controlling for incoming grade point averages indicated main effects for delivery and for orientation toward studying. However, **Figure 9** in the **Research Section** suggests that the patterns of achievement in each of the two treatment groups (satellite, conventional) were very similar for each orientation. While all students tend to get lower grades in satellite classes, students in the Non-Academic subgroup did not appear to be at a particular disadvantage compared to students in the same subgroup taking the same subjects in conventional classes. **Figure 10** in the **Research Section** shows that satellite students in the Non-Academic Orientation subgroup did fairly well on the standardized tests, and did much better than conventional students in the same subgroup. One wonders if satellite instruction could have made a positive difference in the motivation of the Non-Academic subgroup, which helped them do better on the standardized tests. Unfortunately, motivation was assessed at the beginning but not at the end of the courses, so these assessments can not be used to answer questions related to motivational change.

Another type of student identified by the first survey was said to have a "Reproducing Orientation." Usually students with these characteristics get lower grades than students with Meaning Orientation or Strategic Orientation characteristics; they can get fairly good grades by working extremely hard, but they often get too discouraged. They have to work harder to achieve less because their learning strategies are not as efficient as those of the Strategic or Meaning Orientation subgroups--they do not know any "shortcuts." According to previous research, students said to have a "Reproducing Orientation" because they try to reproduce or remember course content rather than really understand it, have low academic self-confidence, and choose courses based on other people's advice rather than their own goals or interests (extrinsic motivation). Their incentive to do schoolwork is "fear of failure" rather than "hope of success" (which motivates students in the Strategic Orientation subgroup) or interest in the subject (which motivates students in the Meaning Orientation subgroup). Their studying and learning efforts are characterized by rote-memorization, short-term retention, and a lack of understanding. In the Midlands Consortium study involving 11 courses by satellite and 10 conventional courses, students in the Reproducing Orientation subgroup had the lowest standardized test scores of the four orientation subgroups in both satellite and conventional treatments. One possible explanation for their lower scores compared to their unmotivated classmates (Non-Academic Orientation) is suggested by studies by other authors, who found that students in the Reproducing Orientation subgroup are often high in test anxiety, which can lower their performance on standardized tests. Fortunately for them, they often do better in their daily class work. In this study they had higher grades than the Non-Academics. Since (even in conventional classes with one fully-qualified teacher on-site five days a week) students in the Reproducing Orientation subgroup by definition are not especially good at picking up cues about what they need to learn or accomplish in order to get a good grade, one might have expected them to be at a greater disadvantage in satellite as opposed to conventional classes. But **Figures 9 and 10** in the **Research Section** do not indicate any particular disadvantage for this group in satellite as opposed to conventional classes in terms of either grades or test scores.

Figures 9 and 10 and **Tables 12 and 14** in the **Research Section** strongly suggest that students whose self-descriptions at the beginning of the year caused them to be grouped with the Non-Academic or Reproducing Orientations were not at a particular disadvantage by not having an on-site teacher certified in that subject. This is another type of evidence that satellite instruction provided by Midlands Consortium was as beneficial to students in the lower-achieving subgroups as instruction provided in more conventional classrooms. Perraton (1987) suggested that the need for face-to-face teaching varies inversely with the motivation and sophistication of the learner. That may be true, but students with less academic or intrinsic motivation did not appear to suffer in terms of grades or test scores in satellite (face-to-face teaching two or three days a week) as compared to conventional instruction (with face-to-face teaching five days a week).

It should be noted that, while it is possible to say the type of satellite instruction practiced by Midlands Consortium appears to be as effective as conventional instruction for all four types of learner, it would not be appropriate to generalize that conclusion to every variation of satellite instruction. The satellite telecasts two or three times a week by Midlands Consortium course producers are supplemented by two or three days a week in which the teaching partner guides students' learning using carefully designed materials and activities. Without further research, it would not be appropriate to generalize the conclusion of no significant difference to forms of satellite instruction in which there are telecasts five days a week or where the teaching partner plays far less of a role.

Hohn and Byrne (1990), one of the five mini-grant studies supported by Midlands Consortium (see **Appendix I**), looked at individual difference characteristics--especially motivational levels-- as they affect achievement, satisfaction and behavior in a course by satellite. Although their study did not include a comparison of satellite to conventional instruction, it included satellite courses from two different Star Schools Consortia with very different philosophies concerning on-air instructional time per week, the role of the TV instructor, the role of the local facilitator, and how students are expected to respond. Although Hohn and Byrne found that students are surprisingly adaptable, that study is an indication of why it might not be wise to automatically generalize results of the Research and Evaluation Center studies to all satellite courses.

Providing challenging educational opportunities to academically talented students

Finally, it almost goes without saying that satellite courses provide academically talented and highly motivated students with opportunities to prepare for college, take more challenging courses, test their skills against a larger pool of talented students from other secondary schools, and gain exposure to instructors from outside their immediate vicinity. Midlands Consortium served these students by offering mathematics (Trigonometry-

Analytic Geometry) and advanced placement courses in Calculus, Chemistry, Physics and American Government.

While setting up the testing part of the research program, Center for Educational Testing and Evaluation staff contacted advanced mathematics and science teachers and teaching partners by phone. Several pieces of information regarding the Advanced Placement satellite courses came out of those conversations. It was surprising to find how few students intended to take the advanced placement examinations. According to the local teachers, students take the advanced placement courses more for college practice than for college credit. Colleges and universities in some parts of the country do not accept advanced placement test results as credit for a college course. Sometimes students do not feel sufficiently well-prepared to take the advanced placement tests, sometimes their teachers or teaching partners do not feel they are sufficiently well-prepared and do not encourage them to take the tests. But that does not mean the advanced placement satellite courses are not "working," because students are getting what they originally wanted: exposure to more challenging courses that will prepare them for college and build up their self-confidence--not necessarily substitute for college courses.

Courses differed in the degree to which students felt confident about college level work in that subject. **Figure 6** in the **Evaluation Section** shows how in some of these courses, many students did not even feel confident about taking the <u>same</u> course in college; while in other courses, more students indicated they felt confident about going on to the <u>next</u> level class. For example, Course 6 had the highest percentage of students who felt ready to go on to the next level, but they were still a minority. While a majority apparently considered this course very successful as a college preparatory course, a smaller percentage saw it as a being equivalent to a college course. Even though students apparently took this course more for college practice than college credit, it was encouraging to note that 70% planned further study of the subject--the highest for any of the ten courses. The course was difficult and the experience might have been somewhat humbling for some of these students, but it did not sour them on the subject. Since few of the students in this course enrolled because of an interest in the subject, and few said they needed this particular course for college, having such a large percentage of students say they planned further study of the subject was a major accomplishment.

It is easy for the best students in a very small school to become complacent or overconfident (only to get a rude awakening in college), and sometimes the best thing for them to learn in high school is a little humility. Apparently, a lesson in humility was part of the syllabus in several satellite courses, where only a tiny proportion of students who usually get A's in their classes were expecting an A (as shown by **Figure 7**: Expected vs. Typical Grades in the **Evaluation Section**). But, and this point should be underscored, even the satellite courses where many typical A students expected to get a lower grade came highly recommended by students, and fairly high percentages indicated they were planning further study in those subjects. Even a satellite course which received lower evaluations on several dimensions was unreservedly recommended by a majority of the students. **Figure 17** in the **Evaluation Section** shows the extent to which students saw each course as an opportunity: (a) for high ability students to take a more challenging course, (b) to learn the latest technology, and (c) to get a preview of college work. **Figure 18** in the **Evaluation Section** shows what percentage of students would consider further study of this subject and would unreservedly recommend the course to other students.

A final indication of the perceived effectiveness of satellite as compared to conventional courses in serving the needs of high-ability, highly-motivated students came from that part of the research program that investigated individual differences or learning styles. This one investigation did not control for incoming grade point average, so it is mean test scores for the satellite and conventional students in each course. **Figure 12** in the **Research Section** compares standard test scores for the satellite and conventional treatment groups.

We found convincing and consistent main effects for course and less consistent or convincing effects for delivery. These comparisons of student achievement in satellite as opposed to conventional treatments of similar subject matter appear to confirm Schramm (1977), who said that "learning seems to be affected more by what is delivered than by the delivery system." Clark (1983) went so far as to say that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition."

Are the learning environments in satellite classes comparable to conventional classes?

A third criterion of effectiveness investigated by one of the Midlands Consortium research studies related to students' perceptions of learning environments. This line of investigation was based partly on a question raised by Perraton (1987) concerning whether distance learning is perceived to be a high-quality learning experience or simply a "dreary means to an end." Even if satellite students did as well as conventional students on standardized tests, and even if students would be unable to take these courses at all without satellite instruction, educators might wonder what had been gained by offering the courses if students felt cheated by not having a teacher fully-qualified to teach that subject on-site five days a week. This investigation was begun in the belief that if students perceived certain components of satellite classroom climate or learning context as being significantly poorer or sadly deficient (compared to conventional classes), satellite course producers should know about those perceptions so they could address the problem.

Typical dimensions described in previous research on classroom climate are teacher support, teacher control, organization and class cohesiveness or structure. Previous research has found that order and organization, cohesiveness and goal direction (as perceived by students) are consistently associated with higher levels of achievement on a variety of cognitive and attitudinal aims. For the Midlands Consortium research, a student survey called "About This Class" (described more completely in the **Research Section** and found in **Appendix M**) was administered near the end of the academic year. It focused on the class as the unit of analysis, and (for the satellite students) took into account the unusual division of instructional labor between the local teacher and the satellite instructor. Otherwise the questions were the same for all the satellite and conventional courses. Several aspects of learning context would logically be most influenced by the local teaching partner: class cohesiveness and goal direction, teacher control, and support for learning. Several aspects of learning context would logically be most influenced by the satellite TV instructor: enthusiasm, and three kinds of teaching skills--organizing, simplifying and relating or explaining the material. **Tables 26-31** and **Figures 15-22** in the **Research Section** indicate relatively few differences in students' perceptions regarding the quality of learning of experience in satellite as compared to conventional courses, but many differences among courses.

Analyses of variance compared courses within the satellite and conventional treatments on students' perceptions of the classroom climate variables of Support, Control, and Cohesiveness/Goal Direction, along with their perceptions of the degree to which teachers or teaching partners took responsibility for helping students develop their study skills ("Study Skill Development"). In interpreting the following results, it is essential to keep in mind that the survey used to measure students' perceptions of classroom climate and their evaluations of teaching had a scale of 1 to 4 (1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree). Therefore, lower scores on an item indicated more agreement with that item, and the lowest scores on a subscale indicated the strongest agreement with the five items on each subscale. A lower subscale mean for any of the variables with results shown on **Tables 26-33** in the **Research Section** indicates that students view the class more favorably than if the subscale mean was higher.

The traditional classroom climate variables (Cohesiveness/Goa. Direction, Support and Control), quantified by means of subscale scores, were submitted to two-factor analyses of variance with delivery and course as the independent variables. **Tables 26-28** in the **Research Section** show the cell means for each of the three traditional classroom climate variables. The dependent variable: Cohesiveness/Goal Direction was submitted to an analysis of variance with the independent variables being course and delivery. **Table 26** shows the cell means for the Cohesiveness/Goal Direction Subscale, which included items on to what extent the teacher/teaching partner and students worked together as a team and to what extent students had a good idea of where they were going and what was expected of them. Although there were main effects for both course and delivery ($p < .001$) and a significant two-way interaction, **Figure 15** in the **Research Section** shows little difference between the satellite and conventional treatment groups.

The Support Subscale included items about teachers or teaching partners who had motivated students to do their best and had made an effort to understand difficulties students were having with their work. There was a significant main effect for course ($p < .001$) but not delivery, and there was a significant two-way interaction ($p < .001$). The lack of difference between perceived support for learning in satellite and conventional treatments suggests that students feel no less support in the satellite classes--a finding which is educationally significant. The row average in the far right column in **Table 27** in the **Research Section** shows a slightly more favorable view for all conventional as opposed to all satellite courses. But **Figure 16** in the **Research Section** indicates how small the differences are. It is interesting to contemplate the finding that students' perceptions regarding their teachers' helpfulness and support are so course-dependent. Perhaps this can be explained in terms of a discrepancy between what students believe they are getting and what they believe they need to succeed in a particular subject area.

It is often said that one role of the "teaching partner" is to motivate students and make sure they put extra effort into their work, and that satellite classes cannot succeed unless teaching partners are willing to exert that kind of control. On the Control Subscale, there were main effects for delivery and course ($p < .001$) and a significant interaction ($p < .01$). **Table 28** shows that conventional classes were seen slightly more favorably but **Figure 17** in the **Research Section** suggests that the differences are again quite small.

On the Study Skill Development subscale, there were main effects for delivery ($p < .01$), and course ($p < .001$), and a significant two-way interaction ($p < .001$). **Table 29** shows individual students' perceptions of the degree to which the teacher or teaching partner helped students develop their study skills. However, once again, when those means are depicted graphically on **Figure 18** in the **Research Section**, there seems to have been very little difference between satellite and conventional classes.

The next set of analyses considers the effects of delivery and course on students' evaluations of conventional teachers or satellite instructors in terms of their enthusiasm and skills in Organizing the Material, Simplifying the Material, and in Relating Ideas (or as that subscale is now called, "Skill in Explaining"). Subscale means for each satellite or conventional course on the items assessing students' perceptions of the enthusiasm of the teacher or TV instructor are shown in **Table 30**. On the dependent variable, Enthusiasm, there was a main effect for course ($p < .001$) but not delivery. There was a significant interaction ($p < .001$), which is easier to interpret by looking at **Figure 19** in the **Research Section**. It was interesting to find a main effect for course but not delivery, because research on teacher effectiveness has suggested that teachers who are more enthusiastic are more effective. In other words, teacher enthusiasm is evaluated as if it were a personal trait. If the satellite instructors as a group had been perceived as being more or less enthusiastic than the average for several conventional teachers there would have been a main effect for delivery, but that did not happen. The subscale measuring Enthusiasm was probably not the ideal yardstick to measure this trait, but future researchers might want to follow-up this result.

On the variables, Skill in Organizing the Material, Skill in Simplifying the Material, and Skill in Relating Ideas, there were main effects for course and delivery ($p < .001$). It seems logical to assume that teaching by satellite requires more advance organization. However, in all subject areas, cell means indicated that satellite instructors were perceived to be less organized than conventional teachers. **Tables 31-33** and **Figures 20-22** in the **Research Section** show the results for these three variables. While the three types of teaching skills assessed are conceptually different, the similarity of the three graphs (**Figures 20-22 in the Research Section**) suggests they may be difficult to separate in practice. Perhaps the most important point to be conveyed by **Figures 20-22** is the importance of course differences.

Research in conventional classrooms has long suggested a relationship between students' perceptions of the classroom environment and a variety of cognitive outcomes. This research question investigated the relationship of individual students' perceptions of classroom climate or context variables to achievement as defined in terms of end-of-course grades and achievement test scores. Correlational analyses were used to understand the positive or negative, favorable or unfavorable associations of classroom climate and/or context variables to achievement as measured by tests or grades. **Figures 15-22** show more clearly than **Tables 26-33** in the **Research Section** that students perceive relatively few differences between the learning environments of satellite courses in general and conventional courses in general. The same tables and figures also suggest that conventional classes are not always perceived more favorably as learning environments, and satellite classes are qualitatively acceptable substitutes. The differences between subject areas are more striking than the differences between satellite and conventional delivery, particularly at the local level (**Figures 15-18**). **Figure 19** suggests that even students' perceptions of teacher or TV instructor enthusiasm may be strongly influenced by subject area. At the very least, these results suggest that students' evaluations of a particular satellite instructor or local teacher should be interpreted in relation to results typical for that subject area.

To repeat what was said earlier, the "About This Class" survey used a scale of 1 to 4 (1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree). Therefore, lower scores on an item indicated more agreement with that item, and the lowest scores on a subscale indicated the strongest agreement with the five items on each subscale. A negative correlation between end-of-course grade (converted to a standard or z score) and a classroom climate subscale score indicates that the more each student agreed with the subscale items, higher the grade or the test score.

For satellite students, the correlations between end-of-course grade and Cohesiveness/Goal Direction, teaching partner Support and Study Skill Development were all -.13 and all significant at the .01 level. For conventional students, the Cohesiveness /Goal Direction correlation was -.08 and not significant; the Support correlation was .10, which was significant at the .05 level. But Control and Study Skill Development on the part of conventional teachers had much weaker and not statistically significant relationships to end-of-course grades. The sample for these analyses included 1165 (577 satellite, 588 conventional) students. **Table 34** in the **Research Section** shows the correlations for satellite and conventional students. Individual students' perceptions of the Support provided by the teacher or teaching partner had a significant correlation with grades in both treatments. But their perceptions of teaching partner Control and Study Skill Development had higher correlations to end-of-course grade in the satellite treatment. **Table 35** in the **Research Section** indicates that, compared to final grades, there were fewer relationships between climate variables and test scores in either the satellite or conventional treatment groups. This analysis included 551 (347 satellite, 204 conventional) students. The only significant correlation for the satellite students was one of -.13 between teaching partner support and test score. No correlations were significant for the conventional students.

As a caution to readers, it should be noted that the magnitudes of even the statistically significant correlations were quite small, and are reported primarily to give other researchers food for thought. Perhaps later studies can focus specifically on the contribution of classroom climate characteristics to achievement, and whether their contributions differ in satellite and conventional treatments. While it is now possible to say the learning environments provided in Midlands Consortium courses by satellite appear to be comparable on several important dimensions to those provided in conventional classes, these results do not provide any basis for generalizing to other models of satellite instruction in which instruction is televised more days a week and local teaching partners play a lesser or different type of role.

Interaction and achievement at the class level

According to several authors mentioned in the **Monograph**, effective learning requires interaction. Interaction between teacher and student is important in any learning environment, but in satellite courses it requires special care and attention. Moore's (1989) discussion of the meaning of interaction raised the following questions: What level of interaction is essential for effective learning? What is good interaction? What does real-time interaction contribute? Is it worth the cost? According to Moore, learner-instructor interaction has several functions: to stimulate or maintain interest, motivate the student to learn, and promote self-direction. Moore said that learner-instructor interaction can be used to try to organize students' application of what is being learned, practice skills, or manipulate ideas that have been presented. Instructors use it to provide counsel, support, and encouragement, or to find out if learners are making progress.

Perraton (1987) listed five purposes served by interaction, feedback, dialog or two-way communication in promoting effective learning. Those five purposes are to: encourage, correct errors, signal difficulties on the part of learner, inform those who prepare educational materials, and allow the learner and teacher to take off in directions which had not been forecast. Although distance education instructors have always been at a disadvantage in providing opportunities for interaction, in recent years, technology has provided ways to help overcome those disadvantages. The need for interaction between teacher and learner can be met using several different technologies, including interactive television (two-way video), a combination of one-way video with two-way audio (sometimes called "talkback"), or some combination of video and computer technologies. Hosie (1989) said, "A dynamic teaching and learning environment requires interaction between teachers and students and, where possible, among students," and that one limitation of broadcast television for educational purposes is the lack of audience interaction. Morehouse et. al. (1987) concluded that "a higher degree of interaction correlates with a higher degree of student involvement in classes," and most authors assume that active involvement contributes to learning and achievement.

Several applications of technology in distance education, including the Midlands Consortium satellite courses, use telephones for two-way communication between teachers and learners. Newman (1989) reported on a demonstration training project using a telecommunications network to convey information about instructional materials and their use in local school districts. Newman was one of the few authors who discussed interaction on the level of classes rather than the individuals. Newman indicated that when interaction using the telecommunications network was taking place, "the most popular activity turned out to be a classroom activity" as opposed to an individual activity.

One examination of interaction by the Research and Evaluation Center made use of district level data collected for OERI (see **Tables 1-6 in Evaluation Section**), and class-level achievement data from one satellite instructor. In Midlands Consortium courses, live instruction by satellite is provided two or three times a week. A classroom teaching partner monitors student viewing and directs planned activities on non-broadcast days. During satellite transmissions, several schools are audio-bridged directly into the studio so students can interact with the instructor (without having to dial in) as the other schools listen. Some classes only interact on those occasions, while some call in more often, or take advantage of other opportunities for interaction. When whole classes are audio-bridged into the studio and interact with the instructor as a group, it seemed reasonable to hypothesize a relationship between interactivity and achievement, using the class, rather than the individual student, as the unit of analysis. Since a major goal of federal Star Schools legislation was to enable economically disadvantaged students to take foreign languages and advanced courses in mathematics and sciences, this study explored the relationship of district socio-economic status to class interaction and achievement outcomes. The proportion of students in a district who were eligible for free or subsidized lunches was used as a proxy for socio-economic status, since a district where 90% of the students are eligible is undoubtedly less affluent than one where only 15% are eligible.

Satellite instructors and their staffs maintain a log of telephone calls received during and between broadcasts. This study made use of one such log from a foreign language class, along with achievement data obtained from the instructor, and district-level data obtained from superintendents. All interactions from one school on a given day were counted as one interaction, and all categories of interaction were collapsed together into a simple count of recorded calls by school per day. The purpose of this study was to answer the following questions: Can classes in less affluent districts learn in a course by satellite? Do they take advantage of interactive opportunities to the same extent as students in more affluent districts? Is the number of interactions related to achievement?

Data were obtained for 64 schools subscribing to this satellite course. Average class enrollment was 8.67. The number of interactions per class ranged from 0 to 19; the mean was 5.375, the mode was 6. The percentage of students eligible for free or subsidized lunches ranged from 4% to 93%. The mean was 47%, the median was 45%, but the mode was 60%. The achievement variable represented the class average composite score including tests and daily work. These scores ranged from 639.7 to 948.3, with a mean of 801.0. Incoming mean grade point averages were made available for 27 classes; they ranged from 1.959 to 3.71, with a mean of 2.937. Classes with higher grade point averages at the beginning of the course had significantly higher achievement at the end.

An analysis of variance with achievement as the dependent variable, and high or low interaction as the independent variable, showed that classes interacting more than six times had significantly higher achievement than those interacting less than six times ($p < .05$). However, and this point should be underscored, this effect disappeared when the analysis was repeated controlling for incoming grade point average.

An analysis of variance with interaction as the dependent variable and proportion of students eligible for free or subsidized lunches (high=above 50%, low=below 50%)

showed that classes in the low group--assumed to be more affluent districts had significantly more interactions ($p < .001$) than classes in the high group--assumed to be less affluent. However, once again, this effect disappeared when the analysis was repeated, controlling for incoming grade point average.

Compared with other distance-teaching technologies, the disadvantages of satellite instruction (for example, occasional problems with equipment, differences in vacation schedules, and school closings due to bad weather in different districts and different states) are concrete and specific. But it would be a mistake to overlook the advantages of satellite instruction--which may be more abstract and intangible. Other technologies provide reliable communication, and even the possibility of two-way video, within a smaller geographical area. As indicated in the **Monograph**, Bates (1988, p. 215) said that television can provide learners with resources which are available in no other way, not even directly through experience. Bates said that television can unite distance learners, who cannot share any other common experience. This course by satellite is a prime example of that process of unifying widely-scattered learners; it brought together students and teachers from as far apart as eastern Montana and the gulf coast of Mississippi. Students in districts with a history of low achievement and cultural isolation were challenged and inspired by the instructor and by their fellow students. Some classes began corresponding with each other across the miles, using the new language they were learning. The highest composite score in this course was earned by a student in a class in which all the students were black, at a district where 40% of the students were eligible for Chapter 1 services, 93% were eligible for subsidized lunches, 92% were minority, and the district dropout rate was 35%.

This investigation found that classes in less affluent districts did call significantly less, but that difference disappeared when incoming grade point average was entered as a covariate. In a dissertation study using data collected in Louisiana concerning courses from another producer, Ford (1990) also found significantly fewer phone interactions by classes in less-affluent districts. The Research and Evaluation Center conducted another investigation of the relationships between interaction, achievement and socio-economic status, focusing on individual students' self-reported interactions.

Achievement, interaction and parents' educational attainment

In American society today, the traditional model of children living with both parents is no longer as common as in years gone by. While some of the young people who participated in this study were living in two-parent families, others were living with one parent all, most or some of the time. For all students, whether they were living with one parent, two parents, or in some other type of family unit, the educational level of the father might be more related to their economic circumstances, while the education of the mother might have had more effect on child-rearing practices, socialization or cultural standards in the home. Although some occupations requiring many years of formal education are not highly rewarded, and some individuals with relatively little formal education manage to earn high incomes, across all occupations, sociological research tends to show a strong positive correlation between education and income.

One series of analyses by the Research and Evaluation Center related to the effectiveness of satellite courses in providing young people with more educational opportunities than their parents had. Results from these analyses have some bearing on the issue of satellite instruction's success in providing educational opportunities to students from lower income families. Once again, one purpose of this investigation was to shed additional light on an issue debated by Jere Brophy and Beau Fly Jones (see the **Monograph Section**) as to whether the benefits of mediated instruction are confined to high achievers, or to the self-confident sons and daughters of the well-educated and well-to-do, while disadvantaged students have a greater need for direct, teacher-led instruction.

Students were asked: What is the highest grade your mother achieved in school? and: What is the highest grade your father achieved in school? For each of those items, they could pick one of the following responses: (1) eighth grade or less, (2) started but did not finish high school, (3) high school graduate, (4) started college but did not graduate, (5) college graduate. **Tables 12-13** and **Figures 1-2** in the **Research Section** illustrate relationships between the educational levels attained by satellite and conventional students' parents and their achievement in terms of grades.

Table 12 shows the grades obtained by students in each treatment group (satellite, conventional) whose fathers attained each level of education, controlling for students' cumulative grade-point average as a measure of prior achievement. The difference between satellite and conventional students' grades was statistically significant ($p < .01$), but there were no significant differences among groups of students whose fathers had various levels of education ($p > .05$). **Figure 1** in the **Research Section** indicates that for students in conventional classes, there was a consistent upward trend: as the fathers' education increased, students' grades got higher. Although satellite students whose fathers graduated from college had higher grades than the other satellite groups, there was no consistent upward trend of improvement in grades as the fathers' levels of education increased.

Table 13 in the **Research Section** shows the grades obtained by students in each treatment group whose mothers attained each level of education, controlling for cumulative grade point average. Once again, there was a main effect for delivery or treatment ($p < .001$), but not for the level of education attained by students' mothers. **Figure 2** indicates that, except for the small number of students whose mothers did not start high school, in both satellite and conventional treatments, as the mothers' education increased, students' grades got slightly higher.

It is well-known that, even within the same occupations, women are not paid as much as men in our society, and women's increasing levels of education tend to be less rewarded in terms of increasing earning power. So it seems reasonable to assume that the educational level attained by students' fathers might have more impact on their economic circumstances, while the educational levels attained by their mothers might be more related to their socialization and upbringing, and thus venture the following interpretation. While there were no main effects for either either parent's educational level, in the mothers' case, there was a consistent upward trend for both satellite and conventional students: as the mothers' education increased, grades increased. Students whose mothers were more successful in school and who stayed in school longer got slightly better grades, but we cannot rule out chance as an explanation. This was also true of conventional but not satellite students' fathers. In the latter case, not only was there no statistically significant difference, there was no consistent upward trend. Assuming for the moment that students' fathers with higher levels of education might have had higher incomes, their children had no advantage in terms of grades in the satellite classes.

In order to measure learning as opposed to grades, in five subject areas, nationally standardized subject-area achievement tests were administered at the end of the academic year. Students' raw scores on these tests were converted to standard scores, making it possible to compare the amounts of learning in the two types of delivery or treatment and in the five subject areas. **Tables 14-15** and **Figures 3-4** in the **Research Section** illustrate relationships between the educational levels attained by satellite and conventional students' parents and their achievement in terms of test scores. **Table 14** shows that the average standard score for all 297 satellite students was .11, while the average for all 244 conventional students was -.14. There were no main effects for either the fathers' education or for delivery. In terms of learning, **Figure 3** shows that conventional students whose fathers dropped out of high school did slightly better than the satellite students on the standardized tests, but at all other levels of education, the satellite students' had higher scores. That result may be due to sampling, or to motivational differences, or to the particular courses being taken. The important finding is that students whose fathers had lower levels of education and who thus might have lower levels of income (and be less able to help students at home because they had never taken the courses themselves) did not learn significantly less than those whose fathers had gone farther in school.

The dependent variable, achievement test score, converted to a standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being delivery and the level of education attained by students' mothers. There were no main effects for either mothers' education or for delivery. **Figure 4** suggests little difference between the satellite and conventional treatment groups at the lowest educational level or at the level of college graduate. Satellite students whose mothers started high school, completed high school, or started college did slightly better but the differences were not statistically significant--therefore we cannot rule out chance as an explanation.

Before making too much of these results, it would be best to design a new study focusing precisely on this question, and obtain more nearly equal samples of students whose fathers or mothers attained each level of education. Studies focused more narrowly on these issues could feasibly gather more information about students' economic and social backgrounds and thus be able to address these issues more directly. These analyses did not include the course or subject-area variable, largely because the number of students in some subject areas who participated in this study was not large enough to bear further subdivision into parents' five educational levels and still maintain adequate cell sizes for all the various courses. Study 3 indicated that course or subject-area differences are often more important than differences between the two delivery systems. In order to analyze subject-area differences, student achievement and parents' educational attainment, future researchers would naturally want to design a study for that purpose alone, with more nearly equal samples of students in different courses. Until such a study is carried out, we can draw some tentative conclusions by interpreting **Figures 1-4** in the **Research Section** in terms of trends.

Table 14 suggests that the satellite students who could be included in that analysis did better on the standardized tests than the conventional students who could be included in that analysis. **Figure 3** shows that the small number of students whose fathers did not even start high school did extremely well on the standardized tests in relation to all other groups. It is possible that students whose fathers dropped out of school so early had extra motivation or worked extra hard and obtained better scores than students whose parents started high school but did not graduate. On the other hand, their unusually high average score may be because that group was smaller, so that one outstanding student could have had a disproportionate influence on that group's mean. It would be ill-advised to make too much of this result without further research including the course variable, with more equal samples, and focusing uniquely on these questions. The smaller number of courses that could be included in analyses of test scores as opposed to grades might also explain the unusually high average test score for satellite students whose fathers had the lowest educational level.

The Research and Evaluation Center also looked at achievement in relation to frequency of interaction and parents' educational levels. Did satellite students who called in more often get better grades or higher test scores? Did satellite students whose parents had more education tend to call in more often? Presumably these students might be more self-assured or more comfortable with long-distance phone communication. Students were asked how often they called in with questions or to get information during the course. Their responses were assigned to the following categories for analysis: (1) never called, (2) called one to five times, (3) called six to ten times, (4) called more than ten times. In the class-level analyses involving one satellite course, districts where more than half the students were eligible for the subsidized lunch program did call or interact significantly less than classes in districts where less than half were eligible. Would a similar relationship between interaction and parents' educational levels (as an indication of socioeconomic status) be found across all courses, using data from individual students?

Tables 16-17 and **Figures 5-6 in the Research Section** illustrate relationships between the educational levels attained by satellite students' parents, their achievement in terms of grades, and the frequency of their interactions. The dependent variable, end-of-course grade, converted to a standard score, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by students' fathers and the number of times students reported calling the satellite instructor. There was a significant main effect for interaction frequency ($p > .01$), but not for the fathers' educational level ($p < .05$). As **Table 16** indicates, a total of 148 satellite students out of the 366 who could be included in this analysis never called their instructors (40%). Another 168 students called from one to five times (46%), and 50 students (14%) called six or more times. Students who said they had never called had an average z score of -.22, compared to .50 for those who interacted at the highest level. **Figure 5** indicates that the most interactive students usually got better grades than the less interactive students whose fathers attained the same level of education but these differences were not statistically significant.

The dependent variable, end-of-course grade, was submitted to a two-factor analysis of variance, controlling for prior achievement, with the independent variables being the level of education attained by students' mothers and the number of times students reported calling. Once again, there was a significant main effect for the number of calls ($p > .01$) but not for the mothers' educational level ($p < .05$). **Table 17** is similar to **Table 16** in suggesting that students who interacted at the highest level usually got better grades than other students whose parents attained the same level of education. Other combinations of student interaction and mothers' educational levels, shown on **Figure 6** in the **Research Section**, were not consistent.

Tables 18-19 and **Figures 7-8** illustrate relationships between the educational levels attained by satellite students' parents, their achievement test scores, and the frequency of their interactions. The dependent variable, achievement test standard score, was submitted to a two-factor analysis of variance, controlling for cumulative grade point average, with the independent variables being the level of education attained by students' fathers and the number of times students reported calling. As indicated in **Table 18**, a total of 246 satellite students could be included in this analysis. There was only one student whose father had the lowest level of education and who called in more than ten times, and that student performed at an exceptionally high level, as shown by **Table 18** and **Figure 7**. There were no main effects for frequency of calling or for the fathers' educational level ($p < .05$). But **Figure 7** in the **Research Section** indicates a slight tendency for students who interacted at the highest level to have better test scores.

Finally, the same test-performance variable was submitted to a two-factor analysis of variance, controlling for cumulative grade point average, with the independent variables being the level of education attained by the mothers and the number of times students reported calling. This analysis included 246 satellite students. There were no main effects. But in contrast to **Tables 16 and 17** depicting performance in terms of grades, **Tables**

18 and 19 show a consistent tendency for test performance to improve as the level of phone interaction increased.

As indicated earlier, the comparative effectiveness of viewing satellite instruction live as opposed to viewing it on a tape-delay basis is an issue with important economic and administrative implications. **Table 3 in the Research Section** shows the number and percent of the satellite students in each course who were viewing the programs live, on tape, or some combination of live and taped viewing. Cross-tabulations of viewing by course indicated that 828 students viewed the satellite courses live, while 576 saw them on tape, and 55 saw some mixture of live and tape. Across all satellite courses, an average of 39% always viewed the programs on tape. Only three courses had students who sometimes saw the program live and sometimes saw it on tape: Applied Economics (13), Basic English and Reading (23) and German I (19). The three courses with the highest percentage of students viewing the satellite course on tape were German II with 72%, Basic English and Reading with 49%, and American Government with 48%. The courses with the lowest percentage of students viewing the satellite course on tape were Chemistry (15%), Trigonometry (22%) and Physics (21%). Across all courses, 57% of the 1459 satellite students for whom this information was available see the programs live, while just over one-third usually watch them on tape This information was furnished by the teaching partners rather than by the students.

Analyses of variance were used to address this issue in terms of three types of effectiveness, focusing on grades, test scores and overall rating for the course. The results indicated that viewing the satellite instruction live did not give students an advantage in terms of grades or test scores. But students who viewed the instruction live, who had the option of participating in simultaneous two-way audio interaction with the instructor and with students at other locations did give significantly better ratings to their satellite courses. So this investigation yielded no indication that satellite students' achievement in terms of grades or test scores suffers when they cannot participate in two-way interaction during the live broadcasts. However, the significant difference between the overall ratings given by the live and taped groups suggests that students did perceive a qualitative difference. To paraphrase Moore's (1989) real-time interaction may be worth the cost in terms of students' qualitative experience, but we did not find a statistically significant qualitative difference in grades or test scores.

Pending more work by other researchers, and putting the results of the two interaction studies together, we might cautiously suggest the following conclusions related to the importance of interaction. Individual students who said they interacted more got higher grades and better test scores. Since the level of education attained by their parents did not make any significant difference in their grades or test scores, there is some reason for believing their interactions may have helped overcome some of the economic, social or cultural and geographical disadvantages faced by many students in districts targeted by the Star Schools Project. The first investigation of interaction suggested that classes in lower-income districts did not call in as much. Therefore, in order to maximize the potential benefits of satellite instruction for equalizing educational opportunities, a little extra encouragement and facilitation of interaction by students in the lower-income districts might be in order. Educators in those districts might be alerted to these trends and be even more strongly advised to make whatever school schedule adjustments are necessary to allow their students to participate in live as opposed to taped instruction. Otherwise, their students may have two strikes against them, since students who view the satellite instruction on tape tend to interact less, and classes in the lower-income districts tend to interact less. While students who viewed the instruction on [illegible] did not get lower grades or test scores than those who could participate in the live [illegible]casts, that could easily be due to particular limitations of these studies. Students viewing the instruction on tape gave significantly lower ratings to their satellite courses, suggesting an important qualitative difference.

Other insights concerning interaction

Certainly, the evaluation data collected in Mississippi suggested there are important differences among the Midlands Consortium courses concerning the frequency and purpose of phone interactions. **Figure 20** in the **Evaluation Section** gives some indication of how often students reported calling in during (on-air) or between (off-air) televised programs. The level of interaction chosen for depiction here was calling in at least once a month. **Figure 11** in the **Evaluation Section** summarizes the results of three items which asked students to evaluate the interactive component of each course, and the average results for students in all courses were found in the far right column. In other words, **Figure 11** shows students' reactions to problems endemic to distance learning: discomfort with calling in, disappointment with the amount of communication with the instructor, and trouble getting questions answered.

Midlands Consortium also sponsored mini-grant studies related to various kinds of interaction. Alexander and Attaway (1990, **Appendix G**) looked at interactions in foreign language by satellite classes, focusing on the proportion of English to the target language. When all observations were summed and averaged to obtain the percentage of English and Spanish in the classroom and by television, the authors found an average of 51% English. The amount of English used by the instructors averaged 59%. Subsequent analyses by the authors revealed that the relative amounts of English and Spanish used in a particular classroom had no relationship to achievement.

Many authors reviewed in the **Monograph** saw interaction as a form of active, as opposed to passive, learning, and therefore considered it a positive good, whether or not its effect on achievement can be documented. More research on this subject will be welcome of course, but so far, it looks as though the effects of interaction may be more affective than cognitive. It is possible that interaction affects motivation, which in turn affects achievement as measured by grades or tests. On the other hand, it is possible that Chen (1986) was right, and that interactivity and passivity are characteristics of individuals rather than media (television vs. computer) or instructional delivery systems (satellite, conventional), or of specific conditions within delivery systems such as course differences, or live vs. tape viewing. In that case, interaction should be seen more as an individual difference (input) variable rather than as an outcome variable which would be expected to change as a result of different treatment conditions.

Tables 9 and 10 in the **Evaluation Section** suggest that interaction among classroom groups of students at widely-scattered locations was not especially emphasized. But there are other indications that whatever networking among schools which occurred was valued. Two mini-grant studies surveying teaching partners found that interaction and networking among teaching partners was a highly-valued part of their experience (Talab and Newhouse, 1990, **Appendix H**) and (Dillon, 1990, **Appendix J**). Dillon reported that many teaching partners mentioned the opportunity to mentor with other teachers, and said they valued their relationship with the satellite instructor.

Interacting by computer

But real-time interactions by phone were not the only way for students to interact with their instructors, several courses made use of interactive computer software programs to allow students to practice their skills, correct errors, signal learning difficulties, or organize their application of what they were learning. Some satellite instructors made use of commercially-developed software, while others were actively involved with the development of the software. **Figure 19** in the **Evaluation Section** summarizes information from an item asking students how often they used computer software. In some courses, computer-assisted instruction was a major component, and this was obvious when larger percentages of students said they used the software at least once a week. **Figure 13** in the **Evaluation Section** shows the course variations in how much students reported learning from the computer software.

One of the mini-grant studies (Wells, 1990, **Appendix I**) provided a case study of the development and incorporation of a "transparent monitoring program" into one of the foreign language courses, and of the problems encountered along the way. One of the most encouraging findings Wells reported was how quickly students adapted to the new program, and how helpful they found it. Indeed the major problems involved had little to do with learning or adaptation to technology, but were more related to shipping disks back and forth.

<u>Teachers and satellite technology</u>

Evaluations from the three groups of adults surveyed in Mississippi (**Tables 11-13 in the Evaluation Section**) also highlighted the adaptivity of educators to this new technology. Although many of the problems that can sometimes hamper the implementation and acceptance of a new technology had been encountered, teaching partners, principals and superintendents indicated they had taken those problems in stride.

Attitudes toward new technology and the question of whether and under what conditions the experience of serving as a teaching partner made teachers more likely to use instructional technology in their other classes interested Talab and Newhouse (1990, **Appendix H**). Talab and Newhouse found that the degree to which teaching partners perceived themselves to be "change agents" correlated with their perceptions of the value of the experience and training they had received, and with a positive attitude toward the introduction of new technology.

Both the Talab and Newhouse (1990) and the Dillon (1990) studies of teaching partners found that the teachers serving in that capacity tended to have several years of experience and courses beyond the bachelors' degree. Dillon's study emphasized their perceptions of that experience in terms of their own professional development, and found their most common response related to the opportunity to learn about and acquire confidence in a new content area. Others discussed the opportunity to learn about new technologies and teaching methods. As noted earlier in this section, many respondents mentioned the opportunity to mentor with other teachers, and said they valued their relationship with the satellite instructor.

As indicated in the **Evaluation Section**, some satellite instructors see their role as providing an extended staff development program for local teachers, who would naturally be expected to take over the full instruction of the class in the second or third year. Sometimes the staff development potential of the satellite courses was even obvious to students. **Figure 16** in the **Evaluation Section** shows the extent to which students saw the satellite courses as a modeling different teaching methods and giving their teachers some new ideas they could use in their other classes.

And when compared to the reactions of teachers and other audience members to the staff development by satellite programs telecast as part of the University of Kansas Star Schools Project, it might be said that the experience of serving as a teaching partner may indeed be the ideal form of staff development. It gives a narrowly-defined target audience--those teachers or staff members with the most immediate and pressing need to know--prolonged and highly prescriptive instruction in how to teach a particular subject. The fact that so many of the teaching partners, compared with the staff development viewers, seem far more appreciative of what they are receiving via satellite may have less to do with the inherent quality of program or presenters than with the fact that these teachers and staff members have an immediate and pressing need to know, and their professional reputations are on the line. The greater respect which teaching partners have for the satellite instructors, compared to what staff development viewers have for the presenters, may be partly the result of greater familiarity and long vs. short duration of the programs. What appears to be a greater respect might also be due to facing similar problems and sharing a common mission.

The results of the University of Kansas staff development evaluations, of the teaching partner survey included in the Mississippi evaluation, and of the mini-grant studies that surveyed teaching partners all convey one of the same impressions as the research study on individual differences among students. While it seems that anyone can learn from satellite instruction, the more motivation, interest, or ability one brings to the experience, the more one can gain from it. However it cannot be said that satellite delivery posed particular obstacles to anyone's learning.

Finding that satellite instruction can provide a cost-effective and educationally valid means of providing educational opportunities to disadvantaged students is particularly important in this recessionary period. Every state in Midlands Consortium is experiencing drastic cuts in state aid to local districts, which will affect the number of teachers they can employ and how much they can pay them. If current trends continue and education is pushed off the national agenda, those small increments of progress made by rural districts and the students they serve during the last brief period of state and federal interest will be lost. The young people of America pay a terrible price for the short attention span of our leaders when it comes to providing and paying for educational opportunities would improve students' individual lifetime earning power, the quality of life in rural America and the competitive position of our national economy. The scarcity of continuation funding for research and evaluation means there will be no one to inform taxpayers when their money has been well spent, and the country is denied information about educators' successes as well as their failures. Reluctance to invest in research and evaluation leads to the widespread, yet erroneous, impression that the problems of education are intractable.

<u>Contributions of the Midlands Consortium Research and Evaluation Center</u>

In the **Monograph**, we commented upon the sheer volume of studies and commentaries on technology-based distance education, and the large and disappointing gaps in existing knowledge, particularly about the effectiveness of satellite-based distance education. Peruniak (1983) observed that "research in distance education is only beginning to evolve from its infancy." Morgan (1984, p. 261), said that "Research and evaluation in distance education seem to be entering an important phase in development. A number of writers have lamented at the apparent lack of a clearly defined paradigm for research and the few empirical findings relating to studying at a distance."

The Midlands Consortium Research and Evaluation Center leaves behind a wealth of empirical findings which should advance the study of technology-based distance education to a higher conceptual plain. In a nutshell, we found that <u>all</u> students can and do learn effectively by satellite. We found that conventional instruction is not always better than satellite instruction, either in terms of students' achievement or their affective reactions to the educational experience. No one really expected satellite instruction to be better, not even the most dedicated practitioners of distance education by satellite. But we found that students and professional educators believe satellite instruction to be a quality alternative and by no means (as Perraton, 1987, phrased the worst-case scenario) "a dreary means to an end--better than nothing but not very good." We found that the level of education attained by students' parents made no significant difference in their grades or test performance in satellite classes. Even students whose parents only went as far as the eighth grade did well in satellite courses, which often represented their only opportunity to take those subjects in high school. We found that students often take the advanced placement classes for college practice rather than for college credit. Having an opportunity to take difficult and challenging courses in a familiar local environment gave students in small rural schools additional confidence in their own academic abilities and reassurance that they could survive in more competitive post-secondary educational environments.

We found that students who viewed the satellite instructional programs on tape did as well in terms of grades and test scores as those who viewed the programs live. But students who viewed the taped instruction did not interact as often and they gave significantly lower overall ratings to their satellite courses--suggesting that live interaction does make a perceptual difference in the quality of students' learning experience. Additional research on this question is needed, but it appears that the higher production costs and local inconvenience of live instruction by satellite is justified. However, if it is not possible for a school to schedule the class during the live telecasts, students can also learn from seeing the same instruction on tape. School officials might be advised to specifically encourage students to call in and interact with the instructors at other times.

We found that one subgroup of students (said to have a "Non-Academic Orientation" toward their schoolwork) who were sadly lacking in motivation at the beginning of the year somehow managed to score above the mean in satellite, but not conventional, courses on standardized tests administered near the end of the year. We found that while satellite courses provide highly-motivated and academically-talented students with challenging opportunities, students without those characteristics were at no more of a disadvantage than students with similar characteristics who were taking the same courses taught entirely by a local teacher. We found no significant difference in test scores between satellite and conventional students on subject area tests. We found that grades are lower in satellite classes, but those students who persisted until the end of the year still appreciated the opportunity to take the courses. And a fairly large percentage said they planned further study of that subject in college. Looking at various aspects of learning environments, we found far more differences among subject areas than between the two delivery methods (satellite or conventional). Given a choice, students in most subject areas would prefer to have a local teacher fully qualified in that subject who could instruct them five days a week. But when districts that cannot provide them with that opportunity, the overwhelming majority of students found this mix of satellite and local instruction an acceptable and welcome alternative.

According to several definitions of the the term "at-risk," we found that students "at-risk" can and do learn effectively in courses by satellite. One course included a large proportion of below-average students with low academic self-confidence, yet they responded with particular enthusiasm to satellite instruction. We found that students in poor districts (where high proportions of students were eligible for the subsidized lunch program) often did quite well in satellite courses, not only in terms of individual achievement but also in terms of class achievement. We found that students in districts with high concentrations of minority students and a tradition of low educational expectations flourished in courses by satellite, furnishing several examples of outstanding individual achievement. We found that teachers, principals and superintendents in those same districts persevered in their enthusiastic participation in all phases of the Midlands Consortium research and evaluation program, often going well beyond the call of duty.

In the **Monograph**, we expressed our belief that researchers should test theory and contribute to a larger structure. Finding relatively few previous studies to guide us, we endeavored to lay a foundation for future researchers. Having criticized previous studies for being unrelated to each other or to other research on teaching or learning, we developed a research program of four conceptually inter-related and theory-based studies. The theoretical perspective or paradigm underlying this research is one that emphasizes the perceptions and intentions of the individual learner. Achievement-testing was only part of our mission. If we had found that students in satellite classes did well on achievement tests but never inquired into their perceptions about their experience, we would have gained nothing. Having found that their perceptions were as positive as their performance, we feel we have made a greater contribution to research in technology-based distance education. Nevertheless, there are still many new worlds to conquer, and we invite other researchers to start building on this base.

As a group, the Research and Evaluation Center studies indicated that this particular form of satellite instruction (with a combination of on-air and carefully guided off-air local instruction) can be effective. Now it would be useful for researchers to see if different variations of satellite instruction work equally well. It may be that an effective teacher will be effective whether delivering instruction in-person or by satellite. Or it might be that even an effective teacher on-the-air five days a week encourages students to become passive observers rather than active learners. It seems likely that the best possible combination is an effective satellite instructor and an effective facilitator or teaching partner, along with materials and activities that force students to take an active role in their own learning. This hypothesis can only be confirmed when producers of satellite instruction using different models of instruction allow researchers to do comparative studies.

THE MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT

FINAL EVALUATION REPORT APPENDICES

Submitted to the
United States
Department of Education

As required by
Grant Award R203A80036,
Star Schools Program

A. EVALUATION ITEM BANK

Item Bank for Evaluating MCSSP Courses, Teachers Inservices and Other Services

Carol Speth
John Poggio
Doug Glasnapp

Midlands Consortium Research and Evaluation Committee

June 1989

BACKGROUND ITEMS FOR ALL ADULT AUDIENCES

Background Information

Please answer the following questions. Your responses will be completely confidential. We ask you to supply an identification number only so that we can match pre- and post-program responses when appropriate.

INSTRUCTIONS: Please provide the <u>last four digits</u> of your social security number or some other unique set of four digits. ____ ____ ____ ____

1. Age on last birthday: (circle one)

   a. 25 or under
   b. 26-30
   c. 31-35
   d. 36-40
   e. 41-45
   f. 46-50
   g. 51-55
   h. 56-60
   i. 61-65
   j. 66 or over

2. Sex:

   a. female
   b. male

3. What is your <u>primary</u> responsibility?

   a. administrator
   b. teacher
   c. support staff member (e.g., counselor, nurse)
   d. school board member
   e. paraprofessional
   f. other, please specify ______________________________

4. Years of experience in your current role.

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

5. Years of experience as a professional educator.

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

6. Years of experience in this school district.

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

7. Which of the following best describes your primary teaching level assignment this year.

   a. preschool
   b. primary (K-3)
   c. elementary (3-6)
   d. middle level (4-8)
   e. junior high (6-9)
   f. high school (9-12)
   g. comprehensive K-8
   h. comprehensive K-12

8. Which of the following best describes the primary teaching responsibility you hold this year?

   a. Mathematics
   b. Home Economics
   c. Social Science
   d. Special Education
   e. Music
   f. Business
   g. Physical Education
   i. Foreign Language
   j. English
   k. Science
   l. Communication Arts
   m. Elementary

9. Name of the school/facility where you are primarily assigned ____________________

10. City __________/County____________________ 11. State ____________________

12. Where are you viewing the program?

   a. in my own building
   b. in a building in my district
   c. in a building not in my district
   d. other: please specify ____

13. Does your building/facility have the capacity to receive downlinked courses by satellite?

___ a. yes
___ b. no
___ c. uncertain

14. Grade levels in your school:

___ a. elementary, grades K-6
___ b. grades K-8
___ c. middle school
___ d. junior high school
___ e. three-year high school, grades 10-12
___ f. four-year high school, grades 9-12
___ g. all secondary grades
___ h. other, please specify ______________________

15. Is your school

___ a. public
___ b. private

16. What is the approximate enrollment in your building?

___ a. less than 50
___ b. 50-99
___ c. 100-149
___ d. 150-199
___ e. 200-249
___ f. 250-299
___ g. 300-349
___ h. 350-399
___ i. 400-499
___ j. 500 or more

17. Which of the following best describes your school's location?

___ a. inner city
___ b. urban
___ c. suburban
___ d. rural

18. Is your school classified as a Chapter I service center?

___ a. yes
___ b. no
___ c. uncertain

19. Estimate the proportion of your students who receive Chapter I instructional services?

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

20. Estimate the proportion of your students who receive free or reduced price lunches?

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

21. Estimate the proportion of your students who are handicapped?

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

22. Estimate the proportion of your students are likely to finish high school.

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

23. Estimate the proportion of your students who are racial/ethnic minority groups.

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

24. Estimate the proportion of your students for whom English is a second language.

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

25. Estimate the proportion of your students who are a grade behind in reading.

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

26. Estimate the proportion of your students who are a grade behind in mathematics.

___ a. 0-9%
___ b. 10-19%
___ c. 20-29%
___ d. 30-39%
___ e. 40-49%
___ f. 50-59%
___ g. 60-69%
___ h. 70-79%
___ i. 80-89%
___ j. 90-100%

27. What level of achievement can be expected of the students in your district? (check one)

___ a. much above the national average
___ b. slightly above the national average
___ c. approximately at the national average
___ d. slightly below the national average
___ e. much below the national average

28. What level of achievement can be expected of your students (i.e., those with whom you typically work)? (check one)

___ a. much above the national average
___ b. slightly above the national average
___ c. approximately at the national average
___ d. slightly below the national average
___ e. much below the national average

29 What was your primary reason for attending this inservice (check one):

___ a. much above the national average
___ b. slightly above the national average
___ c. approximately at the national average
___ d. slightly below the national average
___ e. much below the national average

30. Are you looking forward to this inservice?

___ a. yes, absolutely
___ b. yes, I think so
___ c. I'm indifferent
___ d. no, not especially
___ e. no, not at all

31. Have you attended other televised inservices?

___ a. yes
___ b. no

32. If yes, how many?

___ a. 0
___ b. 1
___ c. 2
___ d. 3
___ e. more than 3

ITEMS ASSESSING READINESS OF ADULT AUDIENCES FOR INSTRUCTION-BY-SATELLITE

<u>How do you feel about the potential introduction of instruction by satellite into your school: (Check all that apply)</u>

___ 1. We've had it for years.
___ 2. Enthused, excited
___ 3. Apprehensive
___ 4. Angry
___ 5. No sentiment one way or the other.
___ 6. Other, please specify ______________________________

7. How would you judge the attitude of your students toward courses by satellite?

___ a. very favorable
___ b. favorable
___ c. unfavorable
___ d. very unfavorable
___ e. unlikely that they have an opinion at this time

8. How would you judge the attitude of your colleagues toward courses by satellite?

___ a. very favorable
___ b. favorable
___ c. unfavorable
___ d. very unfavorable
___ e. no feeling as yet, don't know

9. How would you judge the attitude of your administrators toward courses by satellite?

___ a. very favorable
___ b. favorable
___ c. unfavorable
___ d. very unfavorable
___ e. no feeling as yet, don't know

10. How would you judge the attitude of your school board members toward courses by satellite?

___ a. very favorable
___ b. favorable
___ c. unfavorable
___ d. very unfavorable
___ e. no feeling as yet, don't know

11. How well do you think Chapter I students would learn in courses by satellite compared to conventional courses?

___ a. much better
___ b. slightly better
___ c. about the same
___ d. slightly worse
___ e. much worse
___ f. no basis for opinion

12. How well do you think low achieving students would learn in courses by satellite compared to conventional courses?

___ a. much better
___ b. slightly better
___ c. about the same
___ d. slightly worse
___ e. much worse
___ f. no basis for opinion

What is your knowledge level in reference to each of the following? Respond using the following scale:

a. a great deal
b. a fair amount
c. a little
d. very little
e. nothing

___ 13. cable television
___ 14. microphone
___ 15. special telephone applications
___ 16. microcomputers
___ 17. video recording equipment
___ 18. satellite dishes
___ 19. interactive television
___ 20. video-based courses
___ 21. two-way cable
___ 22. computer bulletin boards
___ 23. fiber optic networks
___ 24. satellite-based transmission
___ 25. audio conferencing
___ 26. teleconferencing
___ 27. microwave broadcast systems
___ 28. closed circuit television
___ 29. computer-assisted instruction

30. Rate the extent of your interest in instruction by satellite: (check one)

___ a. a great deal of interest
___ b. moderate interest
___ c. some interest
___ d. a little interest
___ e. no interest

31. How would you characterize your previous experience with computers? (check one)

___ a. very successful
___ b. reasonably successful
___ c. average success
___ d. fairly unsuccessful
___ e. very unsuccessful
___ f. none to speak of

What is your level of knowledge on each of the following?

a. totally adequate
b. reasonably adequate
c. about half as much as I need
d. pretty inadequate
e. totally inadequate

___ 32. awareness and use of telecommunications technologies
___ 33. operation and use of telecommunications equipment
___ 34. application and use of telecommunications equipmer .n the classroom
___ 35. distance education techniques using telecommunications resources and technologies
___ 36. identifying sources of information about existing courses or inservice programs
___ 37. dealing with co-workers who are resistant to the innovation
___ 38. introducing a technological innovation successful
___ 39. evaluating the quality of distance learning programs currently available
___ 40. serving as a coordinator for an inservice program
___ 41. serving as a teaching partner for a student course.
___ 42. integrating several technological components within a course for students

Items to be sent to Administrators (Principals or Superintendents) who have received equipment with the help of Midlands Consortium

with additional items for those receiving Midlands Programs

Carol Speth
and
John Poggio

Midlands Consortium Star Schools Project

June, 1989

ADMINISTRATOR QUESTIONNAIRE

1. What was the most important reason for initiating an instruction by satellite program in your school?

___ a. It was the only alternative for offering the class.
___ b. We could not find a certified teacher in that subject.
___ c. We could not justify the cost of hiring a teacher in that subject.
___ d. We explored the possibility of jointly hiring a teacher with another district, but did not.
___ e. The use of technology was appealing.
___ f. Other, please specify.___________________________

2. How did you first learn about instruction by satellite?

___ a. Program producer (i.e. Oklahoma State, Missouri School Boards)
___ b. Employee of your district
___ c. technology conference
___ d. another district
___ e. state department of education
___ f. educational consultant
___ g. challenge grant
___ h. Other, please specify ___________________________

<u>What other technologies is your district currently using? (check all that apply)</u>

___ 3. instructional TV
___ 4. cable TV (educational programming)
___ 5. computerized instruction (entire course)
___ 6. videodisc instruction (entire course)
___ 7. none

<u>How are you currently using satellite technology? (check all that apply)</u>

___ 9. comprehensive student credit course(s) in advanced math, science or foreign language
___ 10. instructional segments intended to supplement traditional teacher-taught courses
___ 11. student enrichment viewing to which students might not otherwise have access
___ 12. teacher in-service training
___ 13. community service
___ 14. other, please specify ___________________________

<u>What outside technical or consulting assistance did you receive in setting up your instruction by satellite program? (check all that apply)</u>

___ 15. gathering information on instruction by satellite course providers
___ 16. judging the quality of the course
___ 17. setting up satellite dish and receiver
___ 18. setting up computers
___ 19. installing voice-based learning system
___ 20. installing cassette control devices, recorders, headphones, adaptors
___ 21. learning how to use the software
___ 22. VCR set-up and operation
___ 23. Modifying, installing phone line
___ 24. installing, using speaker phone
___ 25. installing, using modem

What outside technical or consulting assistance did you need but could not locate? (check all that apply)

___ 26. gathering information on instruction by satellite course providers
___ 27. judging the quality of the course
___ 28. setting up satellite dish and receiver
___ 29. setting up computers
___ 30. installing voice-based learning system
___ 31. installing cassette control devices, recorders, headphones, adaptors
___ 32. learning how to use the software
___ 33. VCR set-up and operation
___ 34. Modifying, installing phone line
___ 35. installing, using speaker phone
___ 36. installing, using modem

If you have had technical problems with or malfunctions of the equipment, from whom did you seek assistance? (check all which apply)

___ 37. equipment dealer
___ 38. Midlands Consortium
___ 39. other, please specify ____________________

ITEMS FOR ADMINISTRATORS AT SCHOOLS RECEIVING MIDLANDS PROGRAMS

Which of the following courses by satellite will be offered at your school in 1989-90? (Check all that apply)

___ 40. German I
___ 41. German II
___ 42. Physics
___ 43. Calculus
___ 44. Trigonometry/Analytical Geometry
___ 45. Chemistry
___ 46. Russian
___ 47. Economics
___ 48. American government
___ 49. Basic English and Reading
___ 50. Spanish I

What uses are planned for your school's downlink during the 1989-90 school year? (check all that apply)

___ 51. student enrichment
___ 52. teacher inservice
___ 53. supplemental material in traditional classes
___ 54. none
___ 55. other, please specify ____________ ____________

What type of restrictions are placed on who or how many students could enroll in courses by satellite?

___ 56. grade level
___ 57. ability level
___ 58. size of class
___ 59. no restrictions

What modifications on your part were necessary to accommodate courses by satellite?

___ 60. school calendar
___ 61. adding a few minutes to one period
___ 62. changing start/end times of several or all classes
___ 63. beginning the school day earlier
___ 64. other, please specify ______________________________

65. Would you recommend courses by satellite to other districts?

___ a. yes
___ b. no
___ c. uncertain

ITEMS ASSESSING SATISFACTION WITH COURSES BY SATELLITE

Please answer the following questions using this scale:

a. very satisfied
b. satisfied
c. undecided
d. dissatisfied
e. very dissatisfied
f. not applicable

___ 66. How satisfied are you with the overall quality of instruction of courses by satellite?

___ 67. How satisfied are you with the technical or production quality of courses by satellite?

___ 68. How satisfied are you with the cost of courses by satellite, compared to the cost of other alternatives?

___ 69. How satisfied are you with the level of difficulty of courses by satellite?

___ 70. How satisfied are you with the content of courses by satellite?

___ 71. How satisfied are you with how well courses by satellite fit with your existing curriculum?

___ 72. How satisfied are you with the amount of knowledge students are gaining?

___ 73. How satisfied are you with your access to technical support?

___ 74. How satisfied are you with the ease of equipment maintenance?

___ 75. How satisfied are you with the technical reliability of equipment?

ITEMS ASSESSING ATTITUDES ABOUT THE FUTURE OF SATELLITE INSTRUCTION

Answer the following questions using this scale:

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

___ 76. Instruction by satellite is a quality and cost-effective method of providing upper-level courses.

___ 77. Instruction by satellite will be used to teach many more types of courses in the future.

___ 78. Satellite technology will very likely be responsible for the continued existence of many small schools.

___ 79. State departments of education view instruction by satellite as a threat to their sovereignty.

___ 80. Satellite technology is probably more useful for enrichment viewing and teacner inservice than for stand-alone credit courses.

___ 81. Other technologies will most likely take its place.

___ 82. Instruction by satellite is a stop-gap measure until qualified teachers can be found or hired.

___ 83. Teachers organizations may ultimately decide the fate of instruction by satellite.

Indicate how much you agree or disagree with the following potential problems with instruction by satellite. Use the following scale:

a. strongly agree
b. agree
c. undecided
d. disagree
e. strongly disagree

___ 84. Some districts will not take the role of coordinator seriously.
___ 85. These courses require highly motivated students.
___ 86. The TV instructor cannot respond to students' reactions, speed up or slow down.
___ 87. Lack of immediate feedback for students.
___ 88. Teacher discomfort with the role of coordinator.
___ 89. Interaction between TV instructor and students is either lacking or trivial, compared to that of a conventional classroom situation.
___ 90. Training for coordinators is lacking or insufficient.
___ 91. Scheduling problems, inflexibility of courses.
___ 92. Other, please specify ____________________

Which of the following factors seem likely to limit greater use of distance learning technology in your school/district? (check all that apply)

___ 93. Lack of outside funds to expand usage of distance learning courses.
___ 94. The school district budget.
___ 95. State Department of Education policy and regulations.
___ 96. Lack of distance learning courses in needed subject areas.
___ 97. The cost of equipment maintenance and upkeep.
___ 98. The quality of distance learning instruction.
___ 99. The obsolescence of existing equipment.
___ 100. The attitude of the school board toward technology.
___ 101. Consolidation will eliminate the need for it.
___ 102. Cooperative hiring of teachers among districts will eliminate the need for it.
___ 103. Teacher surpluses will eliminate the need for it.

Which potential uses of instruction by satellite seem promising? (Check all that apply)

___ 104. Meeting a long-term need for expanding curriculum offerings for small schools.
___ 105. Meeting a short-term need for curriculum expansion until other solutions or technologies are more widely available.
___ 106. As a means for small schools to avoid or delay consolidation.
___ 107. As a source of supplemental course material for larger school districts.
___ 108. As a means of teacher in-service training in small districts.

Items for Evaluating MCSSP Teacher Inservices

Carol Speth
John Poggio

Midlands Consortium Research and Evaluation Committee

June 1989

POST PROGRAM EVALUATION ITEMS FOR INSERVICE COORDINATORS

1. Did viewers at your site see the program

___ a. live
___ b. on tape
___ c. we participated live and taped the program(s).
___ d. some participated live, but others watched the program(s) on tape.

2. If you saw the program live, would watching it on tape have made a difference - OR - If you saw it on tape, would watching it live had made a difference?

___ a. yes
___ b. no
___ c. uncertain

3. How many programs did this inservice series include?

___ a. one
___ b. two
___ c. three
___ d. four

4. If this inservice consisted of more than one telecast, how would you describe the pattern of attendance?

___ a. about the same for each program
___ b. increased with each successive program
___ c. decreased with each successive program
___ d. no trend or pattern

5. Did participants at your site attempt to call in?

___ a. yes
___ b. no

6. Were they successful in getting through?

___ a. yes
___ b. no

7. Were all questions that surfaced at your site addressed by the presenters or locally?

___ a. yes
___ b. no
___ c. uncertain

8. Was there any impromptu discussion among viewers at your site?

___ a. yes
___ b. no

9. Generally, how were the programs received?

___ a. Most people seemed very interested.
___ b. Most people seemed somewhat interested.
___ c. About half seemed interested. half not.
___ d. Most people seemed somewhat disinterested.
___ e. Few people were interested.

10. If your school had technical problems attempting to receive the programs, which of the following best describes the source of those problems?

___ a. local equipment not functioning
___ b. local personnel inadequately trained to use the equipment
___ c. both
___ d. neither, problems were at the source of the broadcasts
___ e. neither, the telecommunications part worked but the computer part did not
___ f. not applicable

11. Do you think inservices by satellite expect too much of participants in terms of advance preparation?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. not an issue for this broadcast
___ f. other, please specify ______________________________

12. Do you think these inservices by satellite expect too much, too little, or about the right amount of participants in terms of self-discipline?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. not an issue for this broadcast
___ f. other, please specify ______________________________

13. Do you think these courses expect too much, too little, or about the right amount of participants in terms of motivation?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. not an issue for this broadcast
___ f. other, please specify ______________________________

14. Do you think these courses expect too much, too little, or about the right amount of participants in terms of personal or professional interest?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. not an issue for this broadcast
___ f. other, please specify ________________

15. Have you received guidance from the producers about how the inservice broadcasts should be used?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be of much help
___ d. Yes, but it was not appropriate for our situation
___ e. No
___ f. Not applicable

16. Have you received guidance from the producers about how the equipment should be used?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be of much help
___ d. Yes, but it was not appropriate for our situation
___ e. No
___ f. Not applicable

17. Have you received guidance from the producers about the proper role of the inservice coordinators?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be of much help
___ d. Yes, but it was not appropriate for our situation
___ e. No
___ f. Not applicable

18. Would you be willing to serve as an inservice coordinator again?

___ a. Yes
___ b. No
___ c. Uncertain

How adequately prepared did you feel for each of the following tasks? Use the following scale:

a. totally adequate
b. reasonably adequate
c. somewhat adequate
d. pretty adequate
e. totally inadequate
f. not applicable

___ 19. serving as inservice coordinator
___ 20. operating the satellite-receiving equipment
___ 21. using the phone system
___ 22. taping broadcasts
___ 23. troubleshooting problems with equipment
___ 24. conducting on site activities
___ 25. generating discussion

26. Was the video picture quality acceptable?

___ a. yes
___ b. no

27. Was the audio sound quality acceptable?

___ a. yes
___ b. no

28. What suggestions do you have for improving future inservices of this kind?

____

29. Is there anything else you want to say about this inservice?

____

POST PROGRAM EVALUATION ITEMS FOR INSERVICE PARTICIPANTS

How would you compare this inservice by satellite to more typical ones you have attended? Please indicate your agreement or disagreement with the following statements.

1. It would be difficult to find better quality presenters that we had for the inservice.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

2. This inservice by satellite was better in some respects but not as good in others.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

3. I always prefer having "real people" physically here on site.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

4. My evaluation of any inservice depends more on presenter characteristics than on delivery.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

5. This experience was not as good as participating in the typical "live, in person" inservices I've attended.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

6. The use of the broadcast actually contributed to the overall quality of this inservice.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

7. I would encourage co-workers who missed the live broadcast to watch the tape.

___ a. Strongly Agree
___ b. Agree
___ c. Neutral
___ d. Disagree
___ e. Strongly Disagree

8. Was this teleconference series: (check one)

___ a. Just as effective as a traditional staff development program
___ b. More effective than a traditional staff development program
___ c. Less effective as a traditional staff development program

9. How well did the series meet your expectations?

___ a. exactly as expected
___ b. about as expected
___ c. unlike what I expected but OK
___ d. less than expected
___ e. much less than expected
___ f. had no particular expectations

<u>What were the teleconference strengths (S) and weaknesses (W) and what modifications could have made this a better experience? Please mark as many as apply.</u>

<u>S or W</u> <u>Modifications</u>

10. ____ Content ________________________________

11. ____ Materials ________________________________

12. ____ Format ________________________________

13. ____ Time of day ________________________________

14. ____ Length of sessions ________________________________

15. ____ Your viewing equipment ________________________________

16. ____ Site coordinator ________________________________

17. ____ Your viewing room ________________________________

18. ____ Your on-site participants ________________________________

19. ____ Presenters ________________________________

20. ____ Other ________________________________

21. Did viewers at your site see the program

___ a. live
___ b. on tape
___ c. we participated live and taped the program(s).
___ d. some participated live, but others watched the program(s) on tape.

22. If you saw the program live, would watching it on tape have made a difference - OR - If you saw it on tape, would watching it live had made a difference?

___ a. yes
___ b. no
___ c. uncertain

23. Did you call in a live question?

___ a. Yes
___ b. No

24. Could you have benefited as much from this program if you had not participated live?

___ a. Yes
___ b. No

Comments: ____________________

25. Is live question and interaction important for programs such as this?

___ a. Yes
___ b. No

Comments: ____________________

26. How likely are you to use any of this content in your classes?

___ a. plan to use nearly all of it
___ b. plan to use some of it
___ c. will use very little of it
___ d. will not use any of it
___ e. uncertain

27. If you do not plan to use any of this content in your classes, please indicate why?

___ a. lack of money
___ b. lack of materials
___ c. lack of time
___ d. content does not fit our curriculum
___ e. disagreed with content
___ f. other, please specify ____________________

28. What proportion of the information provided by this series of programs would you judge to be useful to you in your work?

___ a. 100%
___ b. 75%
___ c. 50%
___ d. 25%
___ e. 0%

Please indicate your level of agreement with each of the following statements, using the following scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not applicable

___ 29. This inservice attempted to cover too much material.

___ 30. I was disappointed with the content of this inservice.

___ 31. I can apply the information learned in this inservice.

___ 32. The inservice content was intellectually challenging.

___ 33. The inservice covered topics is reasonable depth.

___ 34. I had sufficient knowledge to enable me to benefit from this inservice.

___ 35. This inservice emphasized important concepts and skills rather than trivial details.

___ 36. Program content was consistent with the objectives of the inservice.

___ 37. The content of this inservice related to other inservices I have taken.

___ 38. The featured presenters and discussion facilitators were effective in communicating their knowledge.

___ 39. The featured presenters and discussion facilitators seemed to understand their audience.

___ 40. The featured presenters and discussion facilitators held my attention.

___ 41. The purpose and objectives of this inservice were clear.

___ 42. This inservice was logically organized.

___ 43. Technical terms were adequately explained within the presentation.

___ 44. Main points were clearly identified and supported with examples and illustrations.

___ 45. The program format was appropriate for the purpose of the inservice.

___ 46. Program time was used effectively.

___ 47. The programs stimulated my thinking and made me want to participate in subsequent discussion.

___ 48. Those of us who attended this inservice together will be discussing the programs in coming days.

___ 49. The interactions after each program added significantly to the presentation.

___ 50. I became actively involved in the discussion even though I did not actually call in.

___ 51. I attended all programs in the series.

___ 52. The handouts were a valuable supplement to the inservice.

___ 53. Supplementary resource materials were useful and appropriate.

___ 54. We had access to sufficient equipment to participate in the subsequent discussion.

___ 55. The inservice material was pertinent to my professional responsibilities

___ 56. My technical skills were improved as a result of this inservice.

___ 57. What I learned in this inservice will help me in my work.

___ 58. This inservice directly contributed to my professional skills.

___ 59. This inservice improved my understanding of concepts and principles in this field.

___ 60. As a result of this inservice, I can now identify main points and central issues in this field.

___ 61. I have achieved insight into implications of the inservice material.

___ 62. I can produce new ideas based on the material in this inservice.

___ 63. As a result of this inservice, I developed the ability to recognize good arguments in the field.

___ 64. As a result of this inservice, I developed criteria for evaluating work in this field.

___ 65 My perspective of the world has been enlarged as the result of this inservice.

___ 66. This inservice gave me a solid background for further reading and thinking.

___ 67. My ability to solve real problems in the field has improved as a result of this inservice.

___ 68. The topic(s) were especially relevant to my situation.

___ 69. Sufficient time was allotted to cover the topics of the inservice.

___ 70. I looked forward to the inservice as the topic was relevant to my situation.

___ 71. I wouldn't mind viewing again taped segments of some of the inservice.

___ 72. We did not have sufficient copies of the handout materials that were referenced.

___ 73. The use of television was inappropriate to adequately address the topic of this inservice.

___ 74. Once the novelty wore off, the inservice tended to drag along.

___ 75. This experience was not as good as participation at the typical "live/in person" inservices I've attended.

___ 76. The use of the technical medium in fact contributed to the overall quality of this inservice.

77. What do you hope to get out of this inservice?

____

____

78. What do you think you are expected to be getting out of this inservice?

____

____

79. What suggestions do you have for improving future inservices of this kind?

____

80. Is there anything else you want to say about this inservice?

____

Items for Evaluating MCSSP Courses for Students

Carol Speth
John Poggio

Midlands Consortium Research and Evaluation Committee

June, 1989

EVALUATION FORM FOR STUDENT COURSE COORDINATORS

1. How many semesters have you served as a coordinator for a course by satellite?

___ a. zero, this is my first
___ b. this is my second
___ c. this is my third
___ d. this is my fourth
___ e. more than four semesters

2. Which course are you coordinating now?

___ a. German I
___ b. German II
___ c. Physics
___ d. Chemistry
___ e. Calculus
___ f. Trigonometry/Analytical Geometry
___ g. Russian
___ h. Economics
___ i. American Government
___ j. Basic English and Reading
___ k. Spanish I

3. What is the enrollment of that course?

____

4. How many hours of training time did you receive for your role as coordinator?

___ a. none
___ b. 1-2
___ c. 3-4
___ d. 5-6
___ e. 7-8
___ f. more than 8

5. Who provided that training?

___ a. Oklahoma State University
___ b. Missouri School Boards Association
___ c. Kansas State University
___ d. local district
___ e. other, please specify ______________________

Rate your level of knowledge or experience with each of the following BEFORE you became course coordinator, using this scale:

a. a great deal
b. a fair amount
c. a little
d. very little
e. nothing

___ 6. microcomputers
___ 7. modems
___ 8. VCR's
___ 9. satellite-receiving equipment
___ 10. computer software
___ 11. tape recorders
___ 12. speaker telephones
___ 13. electronic mail
___ 14. your role as coordinator

Which of the following kinds of training did you receive for your role as coordinator? (Check all that apply)

___ 15. operation of satellite-receiving equipment
___ 16. microcomputer operation
___ 17. use of software
___ 18. use of the modem
___ 19. use of the speaker phone system
___ 20. use of electronic mail
___ 21. your role as coordinator

22. Where did students normally watch the programs?

___ a regular classroom
___ b. library/media center
___ c. computer lab
___ d. other, please specify ___________________________

23. How did your students usually watch the programs?

___ a. live
___ b. on tape
___ c. some live, some on tape

24. Is a phone available for students at your site for use during each class?

___ a. yes
___ b. no
___ c. occasionally

25. Was the video (picture) quality acceptable?

___ a. always
___ b. most of the time
___ c. some of the time
___ d. rarely
___ e. never

26. Was the audio (sound) quality acceptable?

___ a. always
___ b. most of the time
___ c. some of the time
___ d. rarely
___ e. never

Please estimate how often your students used the following course components, using this scale:

a. never
b. about once a month
c. 2-3 times a month
d. about once a week
e. 2-3 times a week

___ 27. the computer software
___ 28. electronic mailbox
___ 29. call-in questions during broadcasts
___ 30. call-in questions during other times during the school day
___ 31. call-in questions from home at night
___ 32. textbook
___ 33. other, please specify ____________________

34. If your class had technical problems in receiving the programs, which of the following best describes the source of those problems? (Check one)

___ a. local equipment not functioning
___ b. personnel not adequately trained to use the equipment
___ c. both
___ d. neither, the problems were at the source of the broadcasts
___ e. not applicable
___ f. other, please specify ____________________

If your class had problems with the course-related software, which of the following describe(s) the source of those problems? (check all that apply)

___ 35. programming bugs within the software
___ 36. software did not work on our equipment
___ 37. poor instructional design within the software program
___ 38. not enough computers
___ 39. students resisted using the software because it was "boring"
___ 40. students resisted using the software because the academic task demands were too difficult
___ 41. not enough time
___ 42. difficulty integrating software component with broadcasts of other course activities
___ 43. demands of the software lessons were out of synch with the televised instruction and/or written materials
___ 44. other, please specify ____________________

45. Compared to the broadcasts, how important was the software in contributing to students' learning?

___ a. more important than the broadcasts
___ b. as important as the broadcasts
___ c. less important than the broadcasts
___ d. uncertain
___ e. not applicable (did not use the software)

46. Generally, how were the programs received?

___ a. most students seemed very interested
___ b. most students seemed somewhat interested
___ c. about half seemed interested, half not
___ d. most students seemed somewhat disinterested
___ e. few students seemed interested

Which of the following duties did you perform as a coordinator? (Check all that apply)

___ 47. telling students what they need to learn
___ 48. grading tests or portions of tests
___ 49. grading daily work
___ 50. maintaining discipline
___ 51. motivating students to do well
___ 52. taping satellite broadcasts
___ 53. operating the satellite-receiving equipment
___ 54. coordinating use of software to insure accessibility to all students
___ 55. assisting students with use of software
___ 56. watching all broadcasts with students
___ 57. encouraging students to call the professor
___ 58. learning course content along with the students
___ 59. troubleshooting problems with computers or other equipment
___ 60. being able to answer simple questions
___ 61. helping students find answers
___ 62. constructing quizzes or worksheets to help students learn
___ 63. identifying and solving individual student problems with course
___ 64. helping students with modem or electronic mail

In your opinion, which of the following duties SHOULD be performed by coordinators? (Check all that apply)

___ 65. telling students what they need to learn
___ 66. grading tests or portions of tests
___ 67. grading daily work
___ 68. maintaining discipline
___ 69. motivating students to do well
___ 70. taping satellite broadcasts
___ 71. operating the satellite-receiving equipment
___ 72. coordinating use of software to insure accessibility to all students
___ 73. assisting students with use of software
___ 74. watching all broadcasts with the students
___ 75. encouraging students to call the professor
___ 76. learning course content along with the students
___ 77. troubleshooting problems with computers or equipment
___ 78. being able to answer simple questionss
___ 79. helping students find answers
___ 80. constructing quizzes or worksheets to help students learn
___ 81. identifying and solving individual student problems with course
___ 82. helping students with modem or electronic mail

83. Would you be willing to serve as a course coordinator again?

___ a. yes
___ b. no
___ c. uncertain

How adequately prepared did you feel for each of the following tasks? Use the following scale:

a. totally adequate
b. reasonably adequate
c. somewhat adequate
d. pretty inadquate
e. totally inadequate
f. not applicable

___ 84. fulfilling your duties as course coordinator
___ 85. operating the satellite-receiving equipment
___ 86. operating the computer hardware
___ 87. using the software
___ 88. helping students use modem, speaker phone, or electronic mail
___ 89. taping satellite broadcasts
___ 90. troubleshooting problems with equipment
___ 91. conducting class activities on off-days
___ 92. generating discussion

93. Do you think courses by satellite expect too much of course coordinators in terms of technical skills?

___ a. yes
___ b. no
___ c. don't know

94. Do you think these courses expect too much, too little, or about the right amount of classroom management skills from course coordinators?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ____________________________

95. Do you think these courses expect too much, too little, or about the right amount of subject matter knowledge from course coordinators?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ____________________________

96. Have you received adequate guidance from the program producers about how the broadcasts should be used in class?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enought to be much help
___ d. Yes, but it was not appropriate to our situation
___ e. No
___ f. Not applicable

97. Have you received adequate guidance from the producers about how the software should be used in class?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be much help
___ d. Yes, but it was not appropriate to our situation
___ e. No
___ f. Not applicable

98. Have you received adequate guidance from the producers about how the telecommunications equipment should be used in class?

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be much help
___ d. Yes, but it was not appropriate to our situation
___ e. No
___ f. Not applicable

99. Have you received adequate guidance from the producers about the proper role of the course coordinators? (Check one)

___ a. Yes, it was quite satisfactory
___ b. Yes, but it came too late to be of much use
___ c. Yes, but not enough to be much help
___ d. Yes, but it was not appropriate to our situation
___ e. No
___ f. Not applicable

Please indicate how much you agree or disagree with the following statements about courses by satellite using this scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not sure

___ 100. They make teachers less important and diminish their role.

___ 101. They dictate the pace of instruction and are not adaptable to students' needs.

___ 102. They kill spontaneity and depersonalize education.

___ 103. They are an excuse to save money, not in students' best interests.

___ 104. They are only appropriate for highly-motivated students.

___ 105. They are only appropriate for high-ability students.

___ 106. They are an opportunity for high-ability students to take more challenging courses with students of similar ability at other schools.

___ 107. They give students and opportunity they would not otherwise have had to become familiar with the latest technology.

___ 108. They promote interaction among students in different parts of the country.

___ 109. They give students a realistic preview of college courses.

___ 110. Under the circumstances, students here are fortunate to get to take these courses at all.

___ 111. Students here are fortunate to get to see and hear such fine instructors.

___ 112. Course coordinators get ideas they can use in their own classes from these programs.

___ 113. Students and teachers really benefit from networking with other schools.

114. Do you think these courses expect too much, too little, or about the right amount of self-motivation from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

115. Do you think these courses expect too much, too little, or about the right amount of study skills or strategies from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

116. Do you think these courses expect too much, too little, or about the right amount of memorization from students.

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

117. Do you think these courses expect too much, too little, or about the right amount of higher-order thinking from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. other, please specify ______________________

STUDENT COURSE FORMATIVE EVALUATION ITEMS AFTER FIRST TEST

Background Information

Please answer the following questions. Your responses will be completely confidential. We ask you to supply an identification number only so that we can match pre- and post-program responses when appropriate.

INSTRUCTIONS: Please provide the last four digits of your social security number or some other unique set of four digits. ____ ____ ____ ____

1. What grade are you in?

___ a. 7th
___ b. 8th
___ c. 9th
___ d. 10th
___ e. 11th
___ f. 12th

2. Age on last birthday:

___ a. 12
___ b. 13
___ c. 14
___ d. 15
___ e. 16
___ f. 17
___ g. 18

3. Sex: _____ a. Female
_____ b. Male

4. Which of the following courses are you in right now?

___ a. German I
___ b. German II
___ c. Russian
___ d. Spanish I
___ e. Physics
___ f. Chemistry
___ g. Trigonometry/Analytical Geometry
___ h. Calculus
___ i. American Government
___ j. Economics
___ k. Basic English and Reading

5. Why did you enroll in this course?

___ a. out of interest in the subject
___ b. to prepare for college or a career
___ c. it was not my decision, I had no choice
___ d. there was no other course I wanted to take
___ e. someone persuaded me to take it
___ f. I didn't know it was going to be taught by satellite
___ g. other, plea:.e specify ______________________________

6. Would you have enrolled in the same course if it had been offered as a regular course?

___ a. Yes
___ b. No
___ c. Don't know

7. Do you plan to go to college?

___ a. Yes
___ b. No
___ c. Don't know

8. Do you need this course for college?

___ a. Yes
___ b. No
___ c. Don't know
___ d. not applicable

9. Who was most responsible for your enrolling in this course?

___ a. No one, I decided on my own
___ b. My parents
___ c. The superintendent
___ d. The principal
___ e. The guidance counselor
___ f. A teacher
___ g. Other students
___ h. Other

10. I like taking responsibility for my own learning.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

11. It is difficult to see the connection between the TV broadcasts and other aspects of the course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

12. I like working on the computer in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

13. Students who call in get good answers to their questions.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

14. I had trouble identifying the important points made by the TV instructor.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

15. This course attempted to cover too much material.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

16. We were given enough guidance to know how to prepare for tests in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

17. It's too easy to fall behind in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

18. We have too much work to do on our own in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

19. I was able to learn from my mistakes on tests.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

20. The TV instructor seems to understand.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

21. There should be more review before tests.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

22. This course was harder than I expected.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

23. I had trouble getting questions answered.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

24. I wish there were more assignments we could do in small groups.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

25. The TV instructor went too fast.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

26. The TV instructor seems enthusiastic about the subject.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

27. I thought the coordinator would teach more.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

28. I expected to learn more from the TV broadcasts.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

29. I thought there would be more lectures.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

30. There's no one to help you.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

31. The coordinator seems to care about students.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

32. I thought it would move faster.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

33. I thought someone would in the classroom would know the subject.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

34. This course is:

___ a. harder than a regular class in the same subject.
___ b. about the same level of difficulty as a regular class in the same subject.
___ c. easier than a regular class in the same subject.
___ d. uncertain

35. This course has:

___ a. more homework than a regular class in the same subject.
___ b. about the same homework as a regular class in the same subject.
___ c. less homework than a regular class in the same subject.
___ d. uncertain

36. How would you rate yourself in academic ability compared with your close friends?

____ a. among the best
____ b. above average
____ c. average
____ d. below average
____ e. poorest

37. How do you think you ranked in your class last semester?

____ a. among the best
____ b. above average
____ c. average
____ d. below average
____ e. poorest

38. Do you think you have the ability to complete college?

____ a. among the best
____ b. above average
____ c. average
____ d. below average
____ e. poorest

39. Forgetting how instructors grade your work, how good do you think it is?

____ a. excellent
____ b. good
____ c. average
____ d. below average
____ e. very poor

40. How certain are you of your answers to the above questions about your ability?

____ a. very certain
____ b. somewhat certain
____ c. unsure
____ d. somewhat uncertain
____ e. very uncertain

STUDENT COURSE SUMMATIVE EVALUATION ITEMS NEAR END OF THE SEMESTER

Background Information

Please answer the following questions. Your responses will be completely confidential. We ask you to supply an identification number only so that we can match pre- and post-program responses when appropriate.

INSTRUCTIONS: Please provide the last four digits of your social security number or some other unique set of four digits. ____ ____ ____ ____

1. What grade are you in?

___ a. 7th
___ b. 8th
___ c. 9th
___ d. 10th
___ e. 11th
___ f. 12th

2. Age on last birthday:

___ a. 12
___ b. 13
___ c. 14
___ d. 15
___ e. 16
___ f. 17
___ g. 18

3. Sex: _____ a. Female
_____ b. Male

4. Which of the following courses are you in right now?

___ a. German I
___ b. German II
___ c. Russian
___ d. Spanish I
___ e. Physics
___ f. Chemistry
___ g. Trigonometry/Analytical Geometry
___ h. Calculus
___ i. American Government
___ j. Economics
___ k. Basic English and Reading

5. Why did you enroll in this course?

___ a. out of interest in the subject
___ b. to prepare for college or a career
___ c. it was not my decision, I had no choice
___ d. there was no other course I wanted to take
___ e. someone persuaded me to take it
___ f. I didn't know it was going to be taught by satellite
___ g. other, please specify ________________

6. Would you have enrolled in the same course if it had been offered as a regular course?

___ a. Yes
___ b. No
___ c. Don't know

7. Do you plan to go to college?

___ a. Yes
___ b. No
___ c. Don't know

8. Do you need this course for college?

___ a. Yes
___ b. No
___ c. Don't know
___ d. not applicable

9. Who was most responsible for your enrolling in this course?

___ a. No one, I decided on my own
___ b. My parents
___ c. The superintendent
___ d. The principal
___ e. The guidance counselor
___ f. A teacher
___ g. Other students
___ h. Other

10. The TV instructor did a good job of explaining things which were difficult to understand.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

11. The TV broadcasts usually held my attention.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

12. I prefer instruction by satellite over a regular class.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

13. It is difficult to see the connection between the TV broadcasts and other aspects of the course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

14. The TV instructor worked hard to help us learn.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

15. I had trouble identifying the important points made by the TV instructor.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

16. This course attempted to cover too much material.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

17. We were given enough guidance to know how to prepare for tests in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

18. It's too easy to fall behind in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

19. We have too much work to do on our own in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

20. The broadcasts made the course more interesting.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

21. The coordinator worked hard to help us learn.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

22. I was able to learn from my mistakes on tests..

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

23. The TV instructor seems to understand students' learning problems.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

24. There should be more review before tests.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

25. The TV instructor helped me see the relationship between new material being presented and things I already knew.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

26. I had trouble getting questions answered.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

27. I wish there were more assignments we could do in small groups.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

28. The TV instructor asked interesting questions that helped me think.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

29. The written assignments in this course just seem like busywork.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

30. This course included different teaching methods.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

31. I thought we would go slower and learn more.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

32. The TV instructor gave good examples.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

33. There's no one to help you.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

34. The coordinator seems to care about students.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

35. I think the grading system is fair in this course.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

36. I thought there would be more communication with the TV instructor.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

37. I thought we would do more with computers.

___ a. Strongly agree
___ b. Agree
___ c. Not sure
___ d. Disagree
___ e. Strongly disagree

38. This course is:

___ a. harder than a regular class in the same subject.
___ b. about the same level of difficulty as a regular class in the same subject.
___ c. easier than a regular class in the same subject.
___ d. uncertain

39. This course has:

___ a. more homework than a regular class in the same subject.
___ b. about the same homework as a regular class in the same subject.
___ c. less homework than a regular class in the same subject.
___ d. uncertain

40. How much have you learned in this course?

___ a. a great deal
___ b. about as much as I should have
___ c. not as much as I should have
___ d. not much at all

41. Would you take another course by satellite?

___ a. Yes, definitely
___ b. Yes, but only as a last resort
___ c. No
___ d. Don't know

Please tell us how much have you used the following course components, using this scale:

a. never
b. about once a month
c. 2-3 times a month
d. about once a week
e. 2-3 times a week

____ 42. the computer software
____ 43. electronic mailbox
____ 44. call in questions during broadcasts
____ 45. call in questions at other times during the school day
____ 46. call in questions from home at night
____ 47. textbook
____ 48. other, please explain ____________________

49. About how many hours per week did you spend studying for this course?

____ a. less than 1 hour
____ b. 2-3 hours
____ c. 4-5 hours
____ d. 6-7 hours
____ e. more

50. What grade do you expect to get in this course?

____ a. A
____ b. B
____ c. C
____ d. D
____ e. F

51. Generally, what kind of grades do you think you are capable of getting (in all your courses)?

____ a. A's
____ b. B's
____ c. C's
____ d. D's
____ e. F's

52. Do you think you have the ability to complete college?

____ a. among the best
____ b. above average
____ c. average
____ d. below average
____ e. poorest

53. Forgetting how instructors grade your work, how good do you think it is?

____ a. excellent
____ b. good
____ c. average
____ d. below average
____ e. very poor

54. How certain are you of your answers to the above questions about your ability?

____ a. very certain
____ b. somewhat certain
____ c. unsure
____ d. somewhat uncertain
____ e. very uncertain

55. Would you recommend this course to other students?

____ a. Yes
____ b. No
____ c. Depends on the student
____ d. Uncertain

56. Would you consider further study of this subject?

____ a. Yes
____ b. No
____ c. Uncertain

Please indicate how much you agree or disagree with the following positive statements about courses by satellite. Use the following scale:

a. Strongly agree
b. Agree
c. Not sure
d. Disagree
e. Strongly disagree

____ 57. They are an opportunity for high-ability students to take more challenging courses with students of similar ability at other schools.

____ 58. They give students and opportunity they would not otherwise have had to become familiar with the latest technology.

____ 59. They promote interaction among students in different parts of the country.

____ 60. They give students a realistic preview of college courses.

____ 61. Under the circumstances, students here are fortunate to get to take these courses at all.

____ 62. Students here are fortunate to get to see and hear such fine instructors.

____ 63. Course coordinators get ideas they can use in their own classes from these programs.

___ 64. Students and teachers really benefit from networking with other schools.

65. Do you think these courses expect too much, too little, or about the right amount of self-motivation from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

66. Do you think these courses expect too much, too little, or about the right amount of study skills or strategies from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

67. Do you think these courses expect too much, too little, or about the right amount of memorization from students.

___ a. too much
___ b. about the right amount
___ c. too little
___ d. don't know
___ e. other, please specify ______________________

68. Do you think these courses expect too much, too little, or about the right amount of higher-order thinking from students?

___ a. too much
___ b. about the right amount
___ c. too little
___ d. uncertain
___ e. other, please specify ______________________

B. SAMPLE UNIVERSITY OF KANSAS EVALUATION FORMS

[illegible] SCHOOLS PROJECT

[illegible] FORM

1. Would you like a Kansas History course this summer?

___ Yes
___ No
___ Unsure (if so, why?)

____

Please indicate your level of agreement with each of the these statements, using the following scale:

4 strongly agree
3 agree
2 disagree
1 strongly disagree
0 not applicable

___ 2. I was satisfied with the content of this staff development program.

___ 3. The presenters were good.

___ 4. The overall TV production quality was good.

___ 5. The satellite reception was good.

___ 6. The supplementary resource materials were useful.

___ 7. The purpose and objectives were clear.

___ 8. Questions about this teleworkshop <u>before</u> the broadcast were accurately answered by phone or by letter.

___ 9. Program content was consistent with the advertising.

___ 10. Those of us who viewed this staff development program rated it good.

___ 11 I would encourage coworkers who missed the live broadcast to watch the tape and read the supplements.

___ 12. This staff development program attempted to cover too much material.

13. As an educational experience, compare this staff development program to others you have seen (Check <u>one</u>)

___ a. This was much better, exposure to very good presenters
___ b. This was better in most respects but not as good in others (Please specify)

____

___ c. It's average, all things considered
___ d. It depends on presenter characteristics, not mode of delivery
___ e. Waste of time
___ f. Other, please specify

____

14. How likely are you to use the content of this staff development program in your classes? (Check <u>One</u>)

___ a. plan to use nearly all of it
___ b. plan to use some of it
___ c. will use very little of it
___ d. will not use any of it

15. If you do not plan to use any of this content in your classes, please indicate why.

___ a. lack of money
___ b. lack of materials
___ c. lack of time
___ d. content does not fit our curriculum
___ e. disliked content
___ f. not applicable material, too theoretical
___ g. it's up to the 'boss'
___ h. other, please specify

____

16. My overall thoughts/suggestions towards this teleworkshop:

★ Star Schools ★ The University of Kansas ★ Bailey Hall Annex ★ Lawrence, KS 66045 ★
(913) 864-3058 OR Fax: (913) 864-3566

BEST COPY AVAILABLE

Please copy this form, pass out to teleworkshop participants, and return

UNIVERSITY OF KANSAS

MIDLANDS CONSORTIUM ★ STAR SCHOOLS PROJECT

STAFF DEVELOPMENT EVALUATION FORM

Literacy Through Literature

1. What is your primary responsibility?
___ administrator
___ teacher
___ support staff member
___ school board member
___ other, please specify

Please indicate your level of agreement with each of the these statements, using the following scale:

4 strongly agree
3 agree
2 disagree
1 strongly disagree
0 not applicable

___ **2.** I was satisfied with the content of this staff development program.

___ **3.** The presenters were good.

___ **4.** The overall TV production quality was good.

___ **5.** The satellite reception was good.

___ **6.** The supplementary resource materials were useful.

___ **7.** The purpose and objectives were clear.

___ **8.** Questions about this teleworkshop before the broadcast were accurately answered by phone or by letter.

___ **9.** Program content was consistent with the advertising.

___ **10.** Those of us who viewed this staff development program rated it good.

___ **11.** I would encourage coworkers who missed the live broadcast to watch the tape and read the supplements.

___ **12.** This staff development program attempted to cover too much material.

13. As an educational experience, compare this staff development program to others you have seen. (Check one)

___ a. This was much better, exposure to very good presenters
___ b. This was better in most respects but not as good in others (Please specify)

___ c. It's average, all things considered
___ d. It depends on presenter characteristics, not mode of delivery
___ e. Waste of time
___ f. Other, please specify

14. How likely are you to use the content of this staff development program in your classes? (Check One)

___ a. plan to use nearly all of it
___ b. plan to use some of it
___ c. will use very little of it
___ d. will not use any of it

15. If you do not plan to use any of this content in your classes, please indicate why.

___ a. lack of money
___ b. lack of materials
___ c. lack of time
___ d. content does not fit our curriculum
___ e. disliked content
___ f. not applicable material, too theoretical
___ g. it's up to the 'boss'
___ h. other, please specify

16. My overall thoughts/suggestions towards this teleworkshop:

★ Star Schools ★ The University of Kansas ★ Bailey Hall Annex ★ Lawrence, KS 66045 ★
(913) 864-3058 OR Fax: (913) 864-3566

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UNIVERSITY OF KANSAS

MIDLANDS CONSORTIUM ★ STAR SCHOOLS PROJECT

STAFF DEVELOPMENT EVALUATION FORM

Effective Administrators = School Effectivness

1. What is your primary responsibility?
___ administrator
___ teacher
___ support staff member
___ school board member
___ other, please specify

Please indicate your level of agreement with each of the these statements, using the following scale:

4 strongly agree
3 agree
2 disagree
1 strongly disagree
0 not applicable

___ **2.** I was satisfied with the content of this staff development program.

___ **3.** The presenters were good.

___ **4.** The overall TV production quality was good.

___ **5.** The satellite reception was good.

___ **6.** The supplementary resource materials were useful.

___ **7.** The purpose and objectives were clear.

___ **8.** Questions about this teleworkshop <u>before</u> the broadcast were accurately answered by phone or by letter.

___ **9.** Program content was consistent with the advertising.

___ **10.** Those of us who viewed this staff development program rated it good.

___ **11.** I would encourage coworkers who missed the live broadcast to watch the tape and read the supplements.

___ **12.** This staff development program attempted to cover too much material.

13. As an educational experience, compare this staff development program to others you have seen. (Check <u>one</u>)

___ a. This was much better, exposure to very good presenters
___ b. This was better in most respects but not as good in others (Please specify)

___ c. It's average, all things considered
___ d. It depends on presenter characteristics, not mode of delivery
___ e. Waste of time
___ f. Other, please specify

---

14. How likely are you to use the content of this staff development program in your classes? (Check <u>One</u>)

___ a. plan to use nearly all of it
___ b. plan to use some of it
___ c. will use very little of it
___ d. will not use any of it

15. If you do not plan to use any of this content in your classes, please indicate why.

___ a. lack of money
___ b. lack of materials
___ c. lack of time
___ d. content does not fit our curriculum
___ e. disliked content
___ f. not applicable material, too theoretical
___ g. it's up to the 'boss'
___ h. other, please specify

---

16. My overall thoughts/suggestions towards this teleworkshop:

★ Star Schools ★ The University of Kansas ★ Bailey Hall Annex ★ Lawrence, KS 66045 ★
(913) 864-3058 OR Fax: (913) 864-3566

C. OERI FORMS

OERI INFORMATION REQUESTS

FORM 1. INSTITUTIONAL CAPACITY

State directors in states should report the following information:

A. List of equipment acquired for production

B. List of positions filled, personnel hired

C. Identify by name, date, time and duration, non-televised training or services provided, including training for course coordinators

D. Approximate number of teaching partners, course coordinators, field-based workers, description of their duties

When the information requested is complete for the first year of Midlands funding, send documentation to:

Malcom Phelps
Oklahoma State University
309 N. Cordell
Stillwater, OK 74078-0422

Do not send partial information, that is segment of data as it is readied. Wait until all information that will be collected is compiled, then send it on to MCREC.

OERI INFORMATION REQUESTS

FORM 2. PROGRAM PRODUCTION

Program producers should report to the extent possible the following information for each production by appropriate category.

Programs produced and televised by category.

Student Courses

Program: ____________, Content/Curriculum Area: ____________
Duration (weeks)
Number of hours televised instruction
Number of hours instruction not televised (if applicable)
Number, location of districts and/or schools receiving program
Number of students enrolled and grade level
Number of coordinators involved
Interaction: Describe nature, some indication of its extent as appropriate

Student Programs other than courses

Program: ____________, Content/Curriculum Area: ____________
Duration (weeks)
Number of hours televised instruction
Number of hours instruction not televised (if applicable)
Number, location of districts and/or schools
Number of students involved and grade level
Number of coordinators involved
Interaction: Describe nature, some indication of its extent as appropriate

Staff Inservice

Program: ____________, Content/Curriculum Area: ____________
Intended Audience: ____________________________
Duration (weeks)
Number of hours televised instruction
Number of hours instruction not televised (if applicable)
Number, location of districts and/or schools
Number of educators in audience
Number of coordinators involved
Interaction: Describe nature, some indication of its extent as appropriate

OERI INFORMATION REQUESTS:

FORM 3. DISTRICTS THAT RECEIVED EQUIPMENT FROM MIDLANDS CONSORTIUM

State directors should obtain and report the following information for each district that received equipment wholly or in part from the Midlands Consortium.

1. District name, number: ____________________

   city: ____________________

   county: ____________________

   state: ____________________

   K-12 enrollment: ____________________

   total number of administrators, teachers and staff: ______

2. List of equipment received and the approximate date it became operational

   ____

   ____

   ____

   ____

3. Answer question 3 for each building where equipment was installed:

   city: ____________________

   county: ____________________

   state: ____________________

   grade levels in the facility: ____________________

The following items request information at the level of the district in which a dish was installed. Some of the information requested may be most readily and accurately available from district personnel.

4A. Grade levels of the students in the district that are expected to be served by the equipment. Circle the grades that apply.

K 1 2 3 4 5 6 7 8 9 10 11 12

4B. What levels of teachers, administrators and support personnel are expected to be served by the equipment received. Check all that apply.

____ 1. all grades
____ 2. primary (K-3)
____ 3. elementary (4-6)
____ 4. middle/junior high (7-9)
____ 5. high school (10-12)

5. Which of the following best describes the district's location?

____ a. inner city
____ b. urban
____ c. suburban
____ d. rural

6. Is this district eligible for Chapter 1 assistance?

____ a. yes
____ b. no

Estimate the percent of students in the district who:

7. receive Chapter 1 services ____________%
8. receive free or reduced price lunches __________%
9. are handicapped __________%
10. are racial or ethnic minority ___________%
11. for whom English is a second language ____________%

12. What is the dropout rate of the district? ____________%

13. Did the district receive a grant from the Consortium to acquire the dish equipment?

___ Yes ____ No

Form 4A: Program Log for 1989-90

Program Name: ______________________ Intended Audience: ____________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								

Staff Development Subscription Log, 1989-90

Form 4B: Reconstruction of Last Year's Program Use, 1988-89

Program Name: ______________________ Intended Audience: ____________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								

Form 5A: Staff Development Subscription Log, 1989-90

Program Name: ____________________ Intended Audience: ______________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								

Form 5B: Reconstruction of Last Year's Staff Development Subscription Log, 1988-89

Program Name: ______________________ Intended Audience: ____________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								

Form 6A: Subscription Log for Non-Course Student Programs, 1989-90

Program Name: ___________ Intended Audience: ___________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	Estimated % of students who receive Chapter 1 services.	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									

Form 6B: Reconstruction of Last Year's Subscription Log for Non-Course Student Programs, 1988-89

Program Name: ______________________________ Intended Audience: ______________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	Estimated % of students who receive Chapter 1 services.	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									

Form 7A: Subscription Log for Student Credit Courses, 1989-90

Program Name: ______________________ Intended Audience: ______________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	Estimated % of students who receive Chapter 1 services.	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									

Form 7B: Reconstruction of Last Year's Subscription Log for Student Credit Courses, 1988-89

Program Name: ______________________ Intended Audience: ____________ Page ___ of ___

Provide the following information for each district enrolling for the program. Use additional sheets as necessary.

District Name	City	County	State	1-inner city 2=urban 3=suburban 4=rural	Estimated District Enrollment	Estimated % of students who receive Chapter 1 services.	District receives Chapter 1 assistance? 1=Yes 2=No	Approximate number of viewers: Live	Taped
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									

D. RESEARCH AGENDA

DISTANCE EDUCATION BY SATELLITE
RESEARCH AGENDA, 1989-90
MIDLANDS CONSORTIUM RESEARCH AND EVALUATION CENTER, CENTER FOR EDUCATIONAL TESTING AND EVALUATION (CETE)

The research questions identified for this year's study focus on the effectiveness of courses by satellite, how much and how well students learn, what individual or subgroup differences affect their learning from this medium, whether the interactive component (two-way audio) really contributes, and how well this instructional approach works for students who are not highly motivated. We are defining effectiveness in terms of test performance, continued study of that subject into the second semester, and satisfaction with the experience of taking a course by satellite. But we hope to go beyond those typical indicators of effectiveness to look at whether students make progress toward becoming better and/or more self-directed learners, because distance education can be most successful when students do become more active and self-directed learners. The next section provides background for the definition of student differences to be used here.

Theoretical Background

Separate research programs initiated independently in several countries have contributed to the field of student learning. In Sweden, Marton (1975) interviewed college students about how they go about reading an academic article, and identified two levels of thinking, which he named deep or surface. Marton found that students' intentions regarding the learning task were inseparable from their processing activities (intention + process = approach). Some intended to reproduce the information to meet externally - imposed assessment demands, others intended to understand what the author was trying to communicate to them through the article.

Meanwhile, Biggs (1978) in Australia and Entwistle in Great Britain, were looking at variations in study methods and motivations. Based on self-report inventories, supported by interviews, they identified several types of (college) student learners. Entwistle deduced the four approaches: Meaning-Oriented, Strategic, Reproducing and Non-Academic. Each approach is characterized (1) by one kind of motivation or intention, (2) by either organized or disorganized study methods, and (3) by either deep or surface processing. Later studies suggest that these characterizations hold up for adult learners, and extend down to age 10-12 years, where the top two levels become hard to distinguish. The deep vs. surface contrast holds up across geographic, linguistic and cultural boundaries, though there are small differences concerning motivation. These approaches are influenced by contextual factors, including assessment demands and subject matter. A deep approach in science courses is somewhat different from a deep approach in social science or foreign language courses. To be technically correct, one should talk about type of approach rather than type of student.

Meaning-Oriented students are intrinsically motivated, enjoy and value learning for its own sake, actively interact with what they are learning, use evidence, relate new information to previous knowledge, and try to see relationships among ideas. Strategics are often just as capable as the Meaning-Oriented students, but less interested in learning for its own sake and more interested in playing the system to get good grades and employment qualifications. They are competitive, self-confident, have a high need for achievement, and often are very organized and methodical in their study habits. They will use a deep approach if that is rewarded by the assessment system. Students in the Reproducing subgroup try to memorize or rote-learn disconnected pieces of information, are motivated by fear of failure, and are not especially good at picking up cues as to what is expected of them. They are limited to a surface approach because they do not know any better; they are motivated to work hard, but become very discouraged. Non-Academics are unmotivated, uninterested in their studies, disorganized in their study habits. Some lack both skills and motivation, others lack one or the other.

We will be using a two-part inventory (Part A--student characteristics, Part B--context characteristics) specially adapted for distance secondary school learners. (See list of subscales, below.)

Applications of Student Learning Theory to Courses by Satellite

While students in the Meaning-Oriented and Strategic subgroups can flourish in courses by satellite, there are good reasons to worry about students characterized by a Reproducing Orientation, and in the long run, the success of these courses may be determined by how well they serve that larger subgroup. The ability of such courses to serve Non-Academic students is even more problematical, yet part of Star Schools' purpose is to serve "at risk" students. Bates (1988), on the other hand, suggests that instructional television can be especially helpful to "high risk" or "borderline" students. Therefore it is far more important to investigate the effectiveness of courses by satellite for students in each subgroup than for students in general.

While the approaches have been found to predict academic performance to some extent, the relationship is not as strong as one might expect, partly because, even in postsecondary education, our assessment systems too often reward rote-learning and memorization. Many American researchers have tried to identify variables that contribute to achievement in terms of grades or test scores, but the British researchers found that students can do almost equally well using Meaning-Oriented, Strategic, or Reproducing approaches. However the quality of their educational experience, and their perceptions of the learning environment within a given course will be quite different. We suspect than inquiring into the quality of the learning experience offered in these courses as perceived by each student subgroup will tell us something about why districts stop subscribing and, by implication, what might be done about that. We know in advance that the Meaning-Oriented and Strategic subgroups will learn more or do better in these courses than the other two groups, they always do; the question is whether the Reproducing and Non-Academic subgroups make some progress or whether they just fall further behind, becoming more discouraged and less motivated in the process. Bates' (1988) research at the Open University suggests that less capable students might need and appreciate televised instruction more than those who learn more easily from text. Information about how that large (Reproducing) subgroup learns from and responds to courses by satellite would be extremely valuable to producers and others.

Research Agenda

A series of five interrelated Research Questions have been prepared to define the research agenda. Each question is presented below followed by a brief rationale.

1. *How important is the live, interactive feature in influencing cognitive and affective outcomes? Which students benefit most?*

Study 1 would compare live vs. taped; and interactive vs. not interactive by looking at students in classes that watch the programs (a) live and make frequent use of the interactive capabilities, (b) live but make no or only minimal use of the interactive capabilities, and (c) on tape and make no use of the interactive capabilities.

2. *How much and how well do students learn in these courses? Which students benefit most? How do students who are low in motivation, low in academic skills or high in anxiety fare in these courses?*

Study 2 would compare students characterized by different learning styles, i.e., approaches, to learning on both the quantifiable learning outcomes measured by standardized tests and on qualitative outcomes (which other researchers have suggested are crucial to the success of distance learning), such as becoming better organized, less superficial and more self-directed learners.

3. *How effective are satellite courses compared to conventional courses?*

Study three would compare students in courses taught conventionally and courses taught by satellite and supplemental activities on non-broadcast days in terms of endo-of-course grades and student achievement on standardized tests.

4. *What influence do contextual features have on student outcomes?*

Study 4 would look more closely at how the non-broadcast course components contribute to different kinds of outcomes for different kinds of students.

5. *How do inservice programs by satellite compare to more conventional types of inservice in terms of the likelihood that participants will use what they have learned? Does type of inservice delivery make as much difference as participant characteristics? Are participants who take a deep approach to learning the inservice material more likely to use the information?*

Study 5 would require collecting follow-up data to find out if participants remember any of what they learned, and whether they are using the information in class.

Implementation of the Research Agenda: Method and Procedures

Data to address research questions 1 through 4 are to be obtained from students and teaching partners enrolled in courses for credit which are taught by satellite. CETE staff will have responsibility for readying all instruments and data gathering procedures (e.g. instruction sheets, answer sheets, etc.). CETE will work with state coordinators for assistance with the data gathering. That is, acquiring information on personnel at receive sites and as necessary, utilizing state coordinators as go-betweens to encourage participation in the research program by personnel at the receive site. Instrumentation, response sheets, etc. will be prepared at CETE and sent directly to the receive site teaching partner. Information and instruction booklets will be included that explicitly detail what, how and when data are to be collected. Data assembled at the receive site is to be relayed directly back to CETE.

CETE will work closely and in cooperation with "on air" instructors, the local producer and institutional coordinators. All instruments, respective to the particular offering, will be shared with these individuals for their input, reaction and sign-off prior to use in the research studies. In effect, control of the research investigation remains with the origination sites. (Note: Instrumentation to be used with a particular course can be augmented at the discretion of the origination site to acquire data beyond that planned for in the proposed studies.)

When a school subscribes for a particular course, the state coordinator will need to inform the local site that: (1) "evaluative information from specified school personnel, the teaching partner and students who will be enrolled in the televised class will be gathered at select times during the semester/year; (2) CETE will be coordinating the effort and we will be getting in touch with them; and, (3) at no time will the data to be gathered identify their school or students, only aggregate data across school sites and courses are being reported. Unless necessary, from that point on CETE will work with the local site to coordinate research data collection.

Research Design

A view across the four student outcome investigations (Studies 1 through 4), reveals that the issues being studied fall into a comparative research plan: televised instruction versus other means of instruction. We would propose that aspects of questions 1-4 be investigated in one comprehensive data collection effort across all appropriate student course offerings. The live, interactive influence (question 1) will be addressed in two ways. First, a natural separation will occur based on whether a site views the course live (therefore has the opportunity to interact) or tapes the transmission for viewing at another time (no opportunity to interact). Live versus taped viewing is proposed to be the major comparison grouping for analyses within the satellite learning sites. In addition, those sites viewing live can be grouped according to their level of interaction and comparative analyses performed among these groupings. Finding course content and student matched comparison groups receiving conventional instruction for data collection will expand the design to address question 3. Comparative conventional classes will be sought by identifying and selecting the equivalent course offered at a site that is receiving another satellite course. For example, if site A is taking AP Physics but offering their own introductory Spanish class, permission will be sought to utilize the foreign language class as a comparison group against the satellite Spanish offering. In this way we will attempt to control for selection bias and group equivalence. Information that allows question 3, the rate and extent of learning, to be addressed is to be assembled by extending data gathering to include pre and posttesting of students in satellite as well as the non-satellite comparison environments. Question 4 which will evaluate the effects of the contextual features of satellite instruction derives its sources of information by administering selected classroom climate subscales from the student learning inventories across sampled sites.

Similarly Study 2, individual difference characteristics related to motivation, study approach and style, independence, etc., will accrue data by pre and post appraisal of student in conventional and satellite broadcast courses. Affective instrumentation for studies 2 and 4 will monitor the following characteristics.

The chart on page 14 provides a representation of the research plan. Research question 5 is discussed later in this presentation.

Subscales on the Student Learning Inventories

About you and your schoolwork (2)*

- Deep Approach
- Strategic Approach
- Surface Approach
- Disorganized Study Habits
- Study Skill
- Hope for Success
- Holistic Style
- Serialist Style
- Negative Motivation
- Fear of Failure
- Affiliation Motivation
- Interest Motivation
- Responsibility Motivation
- Parental Support
- Parental Control
- Peer Group Pressure

About This Class/Climate (4)*

- Preparation for Postsecondary Study
- Emphasis on Formal Achievement
- Independence
- Factual Assessment
- Workload
- Train Study Skills--Teaching Partner
- Organizing--TV Instructor
- Simplifying--TV Instructor
- Relating--TV Instructor
- Serialist--TV Instructor
- Holist--TV Instructor
- Enthusiasm--TV Instructor
- Accessibility--TV Instructor
- Control--Teaching Partner
- Support--Teaching Partner
- Class Climate--Affiliation
- Class Structure and Cohesiveness

*Scales related to particular investigations

Sampling Plan and Data Analysis

The rationale for the research plan is tied to the analysis of the information to be gathered, and in particular to being sensitive to carrying out investigations that afford generalizability of the findings. Since in satellite instruction one instructor serves a multitude of sites, effects could be ascribed to the medium, the instructor or both. To balance this confounding we propose that rather than linking a specific research question to a particular course, that all classes offered contribute data to a specific study question. Thus no one course in most cases will provide sufficient data to address a question, but over courses (generalization) the research question is addressed. Data that are assembled over classes will be treated utilizing the methodology of meta-analysis.

The chart on page 14 summarizes the data gathering structure for Research Question 1 through 4.

Timeline

Coordination of the four student outcome investigations begins almost immediately. The following calendar of events can be expected.

By	Activity
July/August, 1989	• Contact with school sites to plan coordination of data gathering assignments
August 1, 1989	• All pretest instrumentation distributed to state coordinators, all local producers and instructors for review, reaction and finalization
September, 1989	• Pretest data gathering completed
October-November, 1989	• Demographic, background and other profile data collected
December, 1989	• Posttesting for one semester courses
January-February, 1990	• Readying of posttest instrumentation; work with producers, instructors and state personnel to prepare instruments

Timeline (continued)

March, 1990	• Remaining background data gathered
April-May, 1990	• Posttesting
June, 1990	• Follow-ups for final data retrieval

Plan for Research Question 5: Impact of Staff Development Offerings

We propose that the essential question needing to be addressed regarding staff development broadcasts relates to impact on the behavior or instructional practice of participants in a teleconference. Evaluation of participants perceptions regarding outcomes as satisfaction, breadth, quality of offering, timing, appropriateness, etc., need to be monitored at the conclusion of each offering. Presently this task is left to those originating the broadcast with consultative assistance available from CETE. We submit that the question of importance is best addressed by longitudinal follow-up to gauge the change in behavior or practice of participants, and that change should be comparatively examined for persons who participate in live, in person, staff development offerings.

Research Design

To evaluate the question of impact we propose that the inservices to be broadcast be screened to identify those meeting two conditions. First, that the inservice is intended to alter participant behavior, attitudes or practice in a meaningful, measurable way. That is, information sharing, awareness or orientation teleconferences by definition would not be expected by design to change an individuals actions or instructional approach and therefore would not satisfy this first condition. The second condition to be met is to identify those teleconference presenters who in addition to a broadcast would/can be expected to offer the same or similar workshops to similar conferees but in the traditional format, i.e., in-person at a designated site for a limited audience.

The research plan calls for CETE to work with the presenter and local field partners to include in the final session, evaluation data gathering over select indicators as to judgements and expectations regarding the likely use of the information acquired through the inservice, then to follow-up into the field at designated intervals (e.g. one-, two-, three-months) to examine change in practice. Follow-ups would be planned such that a given participant would be monitored only on one occasion in the field. More frequent measurement could lead to the evaluation/research activity stimulating the change as it would serve as a reminder to the participant. Data would be assembled and comparatively evaluated for conventional and teleconference participants. Data gathered would rely for the most part on use of questionnaires distributed by the local field coordinator, and in a few (as necessary) cases, interviews with participants. Again, to the extent possible, meta analysis would be used to evaluate findings. Individual presenters or sites would not be the focus of any analysis, and thus their anonymity can be assured.

Research Plan - Basic Design

	Treatment			
	Satellite			
	Live			
		Interaction level		
	Some/Much	Minimal/None	Taped	Conventional*
Time				
Pre-Assessment Data	X	X	X	X
Posttesting Data	X	X	X	X

X=sampling units for the investigations

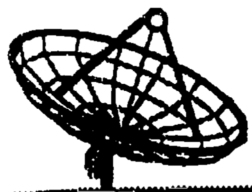
Pre-Assessment Data includes:
- standardized achievement test data for student records
- prior course grades in the content areas
- cumulative grade point average
- learning styles/approach inventory data
- select demographics (age, grade, race)

Posttesting Data includes:
- standardized achievement test that is curriculum relevant
- attitude measures (enthusiasm, content interest, satisfaction, etc.)
- class climate indicators
- learning styles/approach inventory

* preference is to select classes using same text as satellite courses

E. MISSISSIPPI EVALUATION FORMS

University of Mississippi
Office of Distance Learning



Evaluation of Courses by Satellite

Dear Student: We would appreciate your using the answer sheet provided. Please mark your choices using a No. 2 lead pencil. Please leave the NAME section of the answer sheet blank. Now go to the SEX grid, and darken M for male or F for female. Next go to the BIRTHDATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.

Directions: Please darken the appropriate circle for the best response.

1. Which of the following best describes your racial/ethnic background?

    a. American Indian
    b. Asian or Pacific Islander
    c. Black (non-Hispanic)
    d. Hispanic
    e. White (non-Hispanic)

2. What is the highest grade your mother completed in school?

    a. eighth grade or less
    b. started but did not finish high school
    c. high school graduate
    d. started college but did not graduate
    e. college graduate

3. What is the highest grade your father completed in school?

    a. eighth grade or less
    b. started but did not finish high school
    c. high school graduate
    d. started college but did not graduate
    e. college graduate

4. Is a language other than English spoken in your home?

    a. yes
    b. no

5. **What is the main reason you enrolled in this course?**

   a. interested in the subject
   b. to prepare for college or a career
   c. there was no other course I wanted to take
   d. someone talked me into taking it
   e. other

6. **Who was most responsible for your enrolling in this course?**

   a. no one, I decided on my own
   b. my parents or other family members
   c. school administrator or guidance counselor
   d. a teacher
   e. other students

7. **How do you think you ranked in your class last semester?**

   a. among the best
   b. above average
   c. average
   d. below average
   e. poorest

8. **When you do really well in a course, which of the following explanations do you usually give?**

   a. you worked hard.
   b. you are good in that subject
   c. it was an easy course
   d. you were lucky

9. **When you do poorly, which of the following explanations do you usually give?**

   a. you didn't work hard enough
   b. you are not very good in that subject
   c. it is a difficult subject
   d. you had some bad luck

10. **Good luck is more important than hard work for success.**

   a. strongly agree
   b. agree
   c. disagree
   d. strongly disagree
   e. not sure

Which of the following courses by satellite have you taken this year?
(Darken the circle marked a)

11. Basic English and Reading
12. German I
13. German II
14. Spanish I
15. Russian
16. Applied Economics
17. AP American Government
18. AP Physics
19. AP Chemistry
20. AP Calculus
21. Trigonometry

22. Would you have enrolled in the same class if it had been offered as a regular (non-satellite) course?

    a. yes
    b. no
    c. don't know

23. Do you plan to go to college?

    a. yes
    b. no
    c. don't know

24. Do you need this course for college?

    a. yes
    b. no
    c. don't know
    d. not applicable

For items 25-44, please indicate how much you agree or disagree with the following statements about this course by satellite. Use the following scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not sure

25. The TV broadcasts usually held my attention.

26. I prefer instruction by satellite over a regular class.

27. This course attempted to cover too much material.

28. We were given enough guidance to know how to prepare for tests.

29. It's too easy to fall behind in this course.

30. My class could not keep up with the TV instructor.

31. The broadcasts made the course more interesting.

32. I was able to learn from my mistakes on tests.

33. I would feel comfortable taking this same course in college.

34. I would feel comfortable taking the next level course after this in college.

35. I had trouble getting questions answered.

36. I learned a lot from the computer drills.

37. Equipment problems made it hard for us to keep up.

38. The teaching partner usually maintained order in the classroom.

39. This course included different teaching methods.

40. I thought we would go slower and learn more.

41. There's no one to help you.

42. I think the grading system is fair in this course.

43. I thought there would be more communication with the TV instructor.

44. I thought we would do more with computers.

45. This course is:

a. harder than a regular class in the same subject.
b. about the same level of difficulty as a regular class in the same subject.
c. easier than a regular class in the same subject.
d. uncertain

46. This course has:

a. more homework than a regular class in the same subject.
b. about the same homework as a regular class in the same subject.
c. less homework than a regular class in the same subject.
d. uncertain

47. How much have you learned in this course?

a. a great deal
b. about as much as I should have
c. not as much as I should have
d. not much at all

48. Would you take another course by satellite?

a. yes, definitely
b. yes, but only as a last resort
c. no
d. depends on the course

Please tell us how much have you used the following course components, using this scale:

a. never
b. about once a month
c. 2-3 times a month
d. about once a week
e. 2-3 times a week

49. the computer software
50. electronic mailbox
51. call in questions during broadcasts
52. call in questions at other times during the school day
53. call in questions from home at night
54. voice recognition unit

55. About how many hours per week did you spend studying for this course?

a. less than 2 hours
b. 2-3 hours
c. 4-5 hours
d. 6-7 hours
e. more

56. What grade do you expect to get in this course?

a. A
b. B
c. C
d. D
e. F

57. What kind of grades do you think you are capable of getting (in all your courses)?

a. A's
b. B's
c. C's
d. D's
e. F's

58. Do you think you have the ability to complete college?

a. among the best
b. above average
c. average
d. below average
e. poorest

59. Forgetting how instructors grade your work, how good do you think it is?

a. excellent
b. good
c. average
d. below average
e. very poor

60. How certain are you of your answers to the above questions about your ability?

a. very certain
b. somewhat certain
c. somewhat uncertain
d. very uncertain
e. unsure

61. Would you recommend this course to other students?

a. yes
b. no
c. depends on the student
d. uncertain

62. Would you consider further study of this subject?

a. yes
b. no
c. uncertain

For items 63-67, please indicate how much you agree or disagree with the following statements about courses by satellite. Use the following scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not sure

63. They are an opportunity for high-ability students to take more challenging courses with students of similar ability at other schools.

64. They give students an opportunity they would not otherwise have had to become familiar with the latest technology.

65. They promote interaction among students in different parts of the country.

66. They give us an idea of what of college courses would be like.

67. Students at this school are fortunate to get to take these courses at all.

68. Students here are fortunate to get to see and hear such fine instructors.

69. Teaching partners get ideas they can use in their own classes from the TV programs.

70. **Do you think these courses expect too much, too little, or about the right amount of self-motivation from students?**

a. too much
b. about the right amount
c. too little
d. don't know

71. **Do you think these courses expect too much, too little, or about the right amount of study skills or strategies from students?**

a. too much
b. about the right amount
c. too little
d. don't know

72. **Do you think these courses expect too much, too little, or about the right amount of memorization from students.**

a. too much
b. about the right amount
c. too little
d. don't know

Thank you for your cooperation!
Please use the self-addressed stamped envelope and return to:

University of Mississippi
Office of Distance Learning
E.F. Yerby Conference Center
P.O. Box 879
University, MS 38677-0879

EVALUATION OF DISTANCE LEARNING

THE UNIVERSITY OF MISSISSIPPI
Office of Distance Learning

Dear Teaching Partner: We would appreciate your using the answer sheet provided. Please mark your choices using a No. 2 lead pencil. Please leave the NAME section of the answer sheet blank. Now go to the SEX grid, and darken M for male or F for female. Next go to the BIRTHDATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.

Directions: Please darken the appropriate circle for the best response.

1. Did you attend the Technology in Education conference in November?

   a. Yes
   b. No

2. Which of the following best describes your primary teaching responsibility?

   a. Mathematics
   b. Home Economics
   c. Social Science
   d. Special Education
   e. Music
   f. Business
   g. Physical Education
   h. Foreign Language
   i. English/Communication Arts
   j. Science

3. How many years have you been teaching?

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. more than 12 years
   g. not applicable

4. Grade levels in your school:

   a. elementary, grades K-6
   b. grades K-8
   c. middle school
   d. junior high school
   e. three-year high school, grades 10-12
   f. four-year high school, grades 9-12
   g. all secondary grades
   h. K-1

5. **Was the satellite course considered part of your teaching load?**

   a. Yes
   b. No

6. **Where did your students usually view the programs?**

   a. your regular classroom
   b. another classrocm
   c. library/media center
   d. other

7. **How did your students usually view the programs?**

   a. live
   b. taped
   c. some live, some on tape

8. **How many students were in the class?**

   a. 1-5
   b. 6-10
   c. 11-15
   d. 16-20
   e. 21-25
   f. 26-30
   g. 31-35
   h. ?6-40
   i. more than 40

9. **What was the most important reason for initiating a satellite course in your school?**

   a. administration could not find a certified teacher in that subject
   b. administration could not justify the cost of hiring a teacher in that subject
   c. administration considered hiring a teacher with another district but did not
   d. to meet state requirements
   e. to avoid or delay consolidation
   f. to satisfy student, parent, or patron requests
   g. other

For which of the following courses by satellite have you served as teaching partner? (Darken the circle marked A if you served as a teaching partner for that class. Leave the item blank if you did not.)

10. Basic English and Reading
11. German I
12. German II
13. Spanish I
14. Russian
15. Applied Economics
16. AP American Government
17. AP Physics
18. AP Chemistry
19. AP Calculus
20. Trigonometry

21. Would you recommend courses by satellite to other districts?
    a. yes
    b. no
    c. uncertain

For items 22-26, estimate the proportion of students in this class who fall into each category. Use the following scale:

a. 0-9%	f. 50-59%
b. 10-19%	g. 60-69%
c. 20-29%	h. 70-79%
d. 30-39%	i. 80-89%
e. 40-49%	j. 90-100%

22. receive Chapter 1 instructional services
23. racial/ethnic minority groups
24. a grade or more behind in reading
25. a grade or more behind in math
26. likely to finish high school

For items 27-36, indicate how satisfied you are with this course by satellite? Please answer the following questions using this scale:

a. very satisfied
b. satisfied
c. dissatisfied
d. very dissatisfied
e. not applicable

27. overall quality of televised instruction
28. technical or production quality
29. quality compared to what you could do alone with additional training or study
30. level of difficulty
31. content appropriate for your students
32. how well these courses fit your school's curriculum
33. amount of knowledge your students are gaining
34. your access to technical support
35. your access to content support
36. the computer-assisted learning aspect of the course
37. the interactive component
38. the training for teaching partners

39. Overall, how good of an experience was your year/semester as a teaching partner?
    a. very good experience
    b. good experience
    c. bad experience
    d. very bad experience
    e. undecided--some good, some bad

40. **Did you volunteer to be a teaching partner?**

a. yes
b. no

41. **Was a phone available for students to use during the broadcasts?**

a. yes
b. no
c. sometimes
d. not applicable

42. **Where was the phone located?**

a. in the room where we viewed the broadcasts
b. in the main office
c. other
d. no phone was available

43. **Did the University of Mississippi provide computers for your satellite class?**

a. yes, all of them
b. yes, some of them
c. no

44. **What kind of computers were available for your class to use?**

a. all Apple II
b. all IBM or compatible
c. some Apple II, some IBM
d. some Macintosh, some Apple II
e. some Macintosh, some IBM
f. all three of the above
g. not applicable

45. **What was the ratio of students to computers in your class?**

a. one student per computer
b. two students per computer
c. three students per computer
d. four students per computer
e. five or more students per computer

For items 46-51, indicate how often each of your students on average used each of the following? Please use this scale:

a. never
b. about once a month
c. 2-3 times a month
d. about once a week
e. 2-3 times a week

46. the computer software
47. electronic mailbox
48. call in questions during broadcasts
49. call in questions at other times during the school day
50. call in questions from home at night
51. voice recognition unit

For items 52-59 please indicate how much you agree or disagree with the following statements about courses by satellite. Use the following scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not sure

52. They are an opportunity for high-ability students to take more challenging courses with students of similar ability at other schools.

53. They give students an opportunity they would not otherwise have had to become familiar with the latest technology.

54. They promote interaction among students in different parts of the country.

55. They give students an idea of what of college courses would be like.

56. Students at this school are fortunate to get to take these courses at all.

57. Students here are fortunate to get to see and hear such fine instructors.

58. Teaching partners get ideas they can use in their own classes from the TV programs.

59. Students and teachers really benefit from networking with other schools.

60. **Do you think these courses expect too much, too little, or about the right amount of self-motivation from students?**

a. too much
b. about the right amount
c. too little
d. don't know

61. **Do you think these courses expect too much, too little, or about the right amount of study skills or strategies from students?**

a. too much
b. about the right amount
c. too little
d. don't know

62. **Do you think these courses expect too much, too little, or about the right amount of memorization from students.**

a. too much
b. about the right amount
c. too little
d. don't know

How serious was each of the following problems with satellite instruction at your school? For items 63-74, use the following scale:

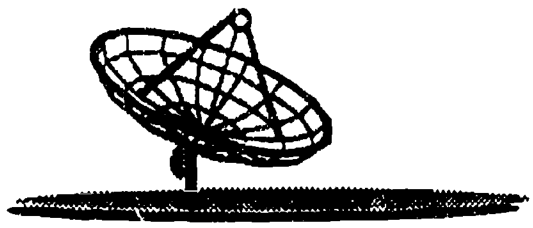
a. serious problem
b. it was a problem but not serious
c. not a problem at all
d. not applicable

63. These courses require highly motivated students.
64. The TV instructor cannot respond to students' reactions, speed up or slowdown.
65. Lack of immediate feedback for students.
66. Interaction between TV instructor and students is lacking or trivial.
67. Inadequate technical training for administrators or teaching partners.
68. Inadequate content training for teaching partners
69. Teaching partners are uncomfortable with their roles.
70. Unforseen costs.
71. Equipment malfunctions.
72. Scheduling problems.
73. Inflexibility of courses.
74. Disappointment with course quality.

Thank you for your cooperation!

Although we include an answer sheet, please feel free to write comments on this questionnaire. We appreciate suggestions for courses, enrichment programs for students, or staff development programs by satellite for teachers, support staff or administrators.

EVALUATION OF DISTANCE LEARNING



THE UNIVERSITY OF MISSISSIPPI
Office of Distance Learning

Dear Principal: We would appreciate your using the answer sheet provided.
Please mark your choices using a No. 2 lead pencil.
Please leave the NAME section of the answer sheet blank.
Now go to the SEX grid, and darken M for male or F for female.
Next go to the BIRTHDATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.
Directions: Please darken the appropriate circle for the best response.

1. Did you attend the Technology in Education conference in November?

   a. Yes
   b. No

2. What is the approximate enrollment in your building?

   a. less than 50
   b. 50-99
   c. 100-199
   d. 200-299
   e. 300-399
   h. 400-599
   i. 600-699
   j. 700-799
   k. 800-999
   l. 1000 or more

3. How many years have you served as principal at this school?

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

4. Grade levels in your school:

   a. elementary, grades K-6
   b. grades K-8
   c. middle school
   d. junior high school
   e. three-year high school, grades 10-12
   f. four-year high school, grades 9-12
   g. all secondary grades
   h. K-12

5. How many teachers and support personnel (regardless of fractional appointments) are there in your building?

a. 5 or less
b. 6-10
c. 11-20
d. 21-40
e. 41-80
f. 81-100
g. 101 or more

6. What is the average number of students per grade in your building?

a. 10 or less
b. 11-20
c. 21-40
d. 41-60
e. 61-80
f. 81-100
g. 101-200
h. 201-400
i. 401-600
j. 601 or more

7. What kind of signal is your school equipped to receive?

a. c-band
b. ku-band
c. both
d. not sure
e. not applicable

8. What was the most important reason for initiating a satellite course in your school?

a. we could not find a certified teacher in that subject
b. we could not justify the cost of hiring a teacher in that subject
c. we considered jointly hiring a teacher with another district but did not
d. to meet state requirements
e. to avoid or delay consolidation
f. to satisfy student, parent or patron requests
g. other

9. How did you first learn about instruction by satellite?

a. Office of Distance Learning, University of Mississippi
b. program producer (i.e. Oklahoma State, Kansas State)
c. technology conference
d. employee of your school
e. another district
f. your superintendent
g. other

10. Would you recommend courses by satellite to other dis s?
a. yes
b. no
c. uncertain

For items 11-15, estimate the proportion of your students who fall into each category. Use the following scale:

a. 0-9%
b. 10-19%
c. 20-29%
d. 30-39%
e. 40-49%
f. 50-59%
g. 60-69%
h. 70-79%
i. 80-89%
j. 90-100%

11. receive Chapter 1 instructional services
12. racial/ethnic minority groups
13. a grade or more behind in reading
14. a grade or more behind in math
15. likely to finish high school

Which of the following courses (items 16-26) by satellite are being offered at your building? (Darken the circle marked A if the course is offered. Leave the item blank if it is not.)

16. Basic English and Reading
17. German I
18. German II
19. Spanish I
20. Russian
21. Applied Economics
22. AP American Government
23. AP Physics
24. AP Chemistry
25. AP Calculus
26. Trigonometry

27. Was enrollment in courses by satellite restricted according to grade level?
    a. Yes
    b. No

28. Was enrollment in courses by satellite restricted according to ability level?
    a. Yes.
    b. No.

29. Was enrollment in courses by satellite restricted to limit class size?
    a. Yes.
    b. No.

30. Did you have to modify your school calendar to accommodate courses by satellite?
    a. Yes
    b. No

31. Did you have to change the starting or ending times of classes to accommodate courses by satellite?
    a. Yes
    b. No

For items 32-40, please indicate how satisfied you are with Midlands Consortium's courses (OSU, KSU) by satellite? Please rate the following aspects of the program using this scale.

a. very satisfied
b. satisfied
c. dissatisfied
d. very dissatisfied
e. not applicable

32. overall quality of instruction
33. technical or production quality
34. cost compared to other alternatives
35. level of difficulty
36. content
37. how well these courses fit your existing curriculum
38. amount of knowledge your students are gaining
39. access to technical support
40. access to content support

How serious was each of the following problems with satellite instruction at your school? for items 41-52, use the following scale:

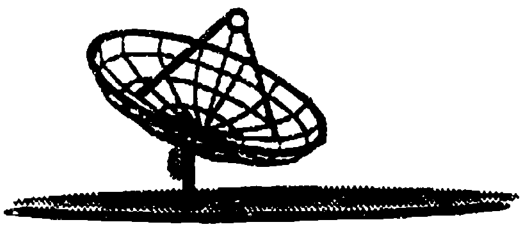
a. serious problem
b. it was a problem but not serious
c. not a problem at all
d. not applicable

41. these courses require highly motivated students
42. the TV instructor cannot respond to students' reactions, speed up or slow down
43. lack of immediate feedback for students
44. interaction between TV instructor and students is lacking or trivial
45. inadequate technical training for administrators or teaching partners
46. inadequate content training for teaching partners
47. teaching partners are uncomfortable with their roles
48. unforeseen costs
49. equipment malfunctions
50. scheduling problems
51. inflexibility of courses
52. disappointment with course quality

Thank you for your cooperation!

Although we include an answer sheet, please feel free to write comments on this questionnaire. We appreciate suggestions for courses, enrichment programs for students, or staff development programs by satellite for teachers, support staff or administrators.

EVALUATION OF DISTANCE LEARNING



THE UNIVERSITY OF MISSISSIPPI
Office of Distance Learning

Dear Superintendent: We would appreciate your using the answer sheet provided. Please mark your choices using a No. 2 lead pencil. Please leave the NAME section of the answer sheet blank. Now go to the SEX grid, and darken M for male or F for female. Next go to the BIRTHDATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.

Directions: Please darken the appropriate circle on the answer sheet for the best response.

1. Which of the following best describes your district's location?

a. inner city
b. urban
c. suburban
d. rural

2. What is the approximate enrollment in your district?

a. less than 50
b. 51-99
c. 100-299
d. 300-499
e. 500-750
f. 751-999
g. 1000-1999
h. 2000-4999
i. 5000-10,000
j. 10,000 or more

3. How many years have you served as superintendent in this district?

a. 1 year or less
b. 2-3 years
c. 4-6 years
d. 7-9 years
e. 10-12 years
f. 13-15 years
g. more than 15 years

4. How many teachers and support personnel (regardless of fractional appointments) are there in your district?

a. 5 or less
b. 6-10
c. 11-20
d. 21-40
e. 41-80
f. 81-100
g. 101 or more

5. What is the average number of students per grade in your district?

a. 10 or less
b. 11-20
c. 21-40
d. 41-60
e. 61-80
f. 81-100
g. 101-200
h. 201-400
i. 401-600
j. 601 or more

6. What level of achievement can be expected of students in your district?

a. much above the national average
b. slightly above the national average
c. approximately at the national average
d. slightly below the national average
e. much below the national average

7. How did you first learn about instruction by satellite?

a. Office of Distance Learning, University of Mississippi
b. program producer (i.e. Oklahoma State, Kansas State)
c. technology conference
d. employee of your school
e. another district

8. Did you attend the Technology in Education conference in November?

a. Yes
b. No

9. Would you recommend courses by satellite to other districts?

a. Yes
b. No
c. Uncertain

10. How would you judge the attitude of your school board members toward courses by satellite?

a. very favorable
b. favorable
c. unfavorable
d. very unfavorable
e. uncertain

11. How would you judge the attitude of your teachers toward courses by satellite?

a. very favorable
b. favorable
c. unfavorable
d. very unfavorable
e. uncertain

For items 12-14, estimate the proportion of your students who fall into each category. Use the following scale:

a. 0-9%	f. 50-59%
b. 10-19%	g. 60-69%
c. 20-29%	h. 70-79%
d. 30-39%	i. 80-89%
e. 40-49%	j. 90-100%

12. receive Chapter 1 instructional services
13. receive free or reduced price lunches
14. are racial/ethnic minority
15. are a grade or more behind in reading
16. are a grade or more behind in math
17. are likely to finish high school

Which of the following courses by satellite are being offered in your district? (Darken the circle marked A if the course is offered. Leave the item blank if it is not.)

18. Basic English and Reading
19. German I
20. German II
21. Spanish I
22. Russian
23. Applied Economics
24. AP American Government
25. AP Physics
26. AP Chemistry
27. AP Calculus
28. Trigonometry

For items 29-37, please indicate how satisfied you are with Midlands Consortium courses (OSU, KSU) by satellite? Please answer each of the following questions using this scale:

a. very satisfied
b. satisfied
c. dissatisfied
d. very dissatisfied
e. not applicable

29. overall quality of instruction
30. technical or production quality
31. cost compared to other alternatives
32. level of difficulty
33. content
34. how well these courses fit your existing curriculum
35. amount of knowledge your students are gaining
36. access to technical support
37. access to content support

Which of the following potential problems are likely to limit the increased future use of satellite courses in your district? For items 38-49, please use the following scale:

a. very likely to limit greater use
b. might limit greater use
c. not likely to limit greater use
d. not applicable

38. these courses require highly motivated students
39. these satellite courses are too difficult for our students
40. too expensive, no outside support
41. State Department of Education policies and regulations
42. cost of equipment maintenance and upkeep
43. teachers dissatisfied
44. students dissatisfied
45. consolidation will eliminate the need for them
46. local teachers will be able to teach the courses themselves without satellite
47. scheduling problems
48. inflexibility of courses
49. disappointment with course quality

How strongly would you agree or disagree with each statement about courses by satellite? For items 50-57, please use the following scale:

a. strongly agree
b. agree
c. disagree
d. strongly disagree
e. not applicable

50. They give students a realistic preview of what college courses are like.
51. Our students and teachers benefit from interaction with other schools
52. They are an opportunity for high-ability students to take more challenging courses.
53. Our students are fortunate to get to take these courses at all.
54. Teaching partners get ideas they can use in their non-satellite classes.
55. They give students a unique opportunity to become familiar with new technologies.
56. Our students are fortunate to get to see and hear such fine instructors.

Thank you for your cooperation!

Although we include an answer sheet, please feel free to write comments or suggestions on this questionnaire. We appreciate suggestions for courses, enrichment programs for students, or staff development programs by satellite for teachers, support staff or administrators.

F. SAMPLE REQUEST FOR PROPOSALS

/ /

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT
Faculty/Student Research Program

PROPOSAL COVER SHEET

Name of principal investigator: ______________________________
last name first name middle initial

Mailing address: ______________________________

____

____

Telephone: ______________ ______________

Applicant status (faculty, graduate student, other) ______________________________

Department/University: ______________________________

Institution: ______________________________

Co-investigators (if any, list name and affiliation):

____

____

____

Title of proposed study: ______________________________

____

Applicant signature ______________________________

Faculty advisor signature (graduate students only): ______________________________

Signature of the Midlands Consortium state director, [name, address, phone]

____

MIDLANDS CONSORTIUM STAR SCHOOLS PROJECT
Faculty/Student Research Program

REQUEST FOR PROPOSALS

The Midlands Consortium Star Schools Project (MCSSP) through the Center for Educational Testing and Evaluation at the University of Kansas is offering a small grants program for faculty and graduate students for research on the effectiveness of distance education provided via satellite or interactive video-based technology.

Proposals will be evaluated on the basis of their potential contribution to a theoretical understanding or model of technology-based distance education. A proposal must explain what is to be done and its significance in a manner intelligible to any faculty member regardless of discipline.

The Consortium is most interested in research initiatives which are (or can be linked to) model- or construct-driven, and which analyze:

1) processes of teaching or learning at a distance;
2) outcomes associated with methods of technology-based distance education;
3) organizational issues related to technology-based distance education programs (for example: decision-making, extent of administrator involvement, relationship to overall school effectiveness, etc.); or
4) factors of production and technology that facilitate distance learning.

Investigations that address current practice in a specific setting are welcomed. Instructional programs to be studied include, but are not limited to, programs produced using Star Schools funds. Studies that focus on individual difference variables (for example: age, ability/aptitude, prior achievement, type or level of motivation, learning or cognitive styles, etc.), the learning environment, or production and/or delivery variables are encouraged. Studies examining audiences that could be described as rural, economically disadvantaged, or educationally at-risk are especially encouraged. Further, specific targeted reviews of the literature and meta evaluations are viable as proposals.

Awards will be up to $3,500 each. Only direct costs will be paid (including fringe benefits). It is expected that six or seven awards will be made across the Midlands Consortium. To be eligible for consideration, the applicant should be a faculty member at the University of Kansas, or be enrolled in a graduate program at KU, and must have the support of the Dr. Steven Tripp. Graduate stude[illegible] applicants should include a letter from an adviser or faculty sponsor indicating willingness to provide local supervision.

In addition to the maximum $3500 funding, applicants are expected to obtain cost-sharing derived from resources made available through their local sponsoring agency (i.e., department, unit, school, college or local Star Schools program.) Cost sharing should reflect that amount necessary for the successful conduct of the project as proposed. It is expected that the projects being proposed will require at least $1750 (or half the amount being requested) of cost sharing provided by the local sponsoring agency.

Funding can begin as early as June 19, 1989. Acceptance of a grant implies agreeing to complete the project by June 30, 1990 and submit a publication-quality progress of their research by that date.

To be considered in this competition, an application must be postmarked by June 2, 1989. One copy of the completed grant application is to be submitted to Dr. Tripp. Five additional copies are to be sent to Dr. Carol Speth. Center for Educational Testing and Evaluation, 409 Bailey Hall, University of Kansas, Lawrence, KS, 66045-2327. Applicants will be notified concerning the success of their proposals by mail.

Proposals should include:

1) Cover sheet (use attached form)
2) 250 word abstract
3) Description of the problem to be researched and the approach to it; 3-5 pages long (single space). Include literature review, study objectives and methods and procedures sections.
4) Potential implications/significance of the study;
5) Timeline for the project;
6) Budget (use attached form);
7) Curriculum vita of principal investigator; and
8) Instruments to be used (if available/appropriate);

For further information, contact Dr. Steven Tripp, Bailey Annex, University of Kansas, Lawrence, KS 66045. Applicants are encouraged to discuss their ideas with Dr. Tripp, (913) 532-6361. Dr. Speth, (913) 864-3537, may also be contacted for information.

PROPOSAL BUDGET REQUEST*

	AMOUNT REQUESTED	COST SHARING
I. PERSONNEL:		
Principal Investigator: Salary amount requested for applicant (Indicate proposed level of effort)	$ ________	________
____ % Effort	$ ________	________
Research Assistant:		
# ____ Months X ____ % Effort X $____ Full Time Rate		
Student Hourly:	$ ________	________
# ____ Hours X $____ Hourly rate		
Others (indicate):	$ ________	________
From ____ to ______, at ______ % Effort		
Fringe Benefits:	$ ________	________
____ X Faculty Salary = $ ______		
____ X Student Salary = $ ______		
II. CONSUMABLE MATERIALS: (Itemize)	$ ________	________
III. TRAVEL: (How computed)	$ ________	________
$ __________ In-State	$ ________	________
$ __________ Out-of-State	$ ________	________
IV. OTHER COSTS: (Itemize)	$ ________	________
TOTAL	$ ________	________

Principal Investigator

____

Signature of Applicant

for Cost Sharing:

____

Signature of Responsible Authority

Name (type): ____________________

Position: ____________________

* Only support for Direct Costs (including fringe) will be funded

G. MINIGRANT REPORT -- Loren Alexander

INTERACTION ANALYSIS OF SPANISH BY SATELLITE

by Loren Alexander
and Kye Attaway
Kansas State University
September 20, 1990

During the academic year 1989-90 secondary school learners in small schools from several midwestern states received a beginning Spanish course by satellite from Kansas State University. The following is a report on the use of an interaction analysis tool in conjunction with these schools and local reception of the telecasts. Students and teaching partners on site in the schools, and university students and faculty at Kansas State University carried out the recording of data, "tallying". The author developed the analysis tool and analyzed the data.

OVERVIEW

In contrast to the pervading image that such television courses include on-camera learners, the KSU Spanish course originated in a television studio where only the teacher and, at times, assistants, (no studio class) were on camera. The teaching partners in the schools received training prior to the course and during the course, and were treated as full-fledged professional educators with the capability of managing classroom interaction, giving assignments, overseeing study, grading homework with the aid of keys from the instructor, and many other duties that befall the classroom teacher and which are keyed to management over instruction in the language. In addition, the teaching partners, who, for the most part, had little or no Spanish skills, learned the language along with the students, setting a model of involvement in language acquisition. The teaching partners facilitated learning by the video course in many ways, including work with Spanish speaking exercises.

Telecasts to the learners occurred two days each week (Tuesdays and Thursdays); one day each second week the teaching partners participated in a telecast focusing on the practical matters of fulfilling their role. These Friday telecasts eventually became an opportunity for another day of instruction targeted to the learners. Each session lasted a full academic hour (50 minutes). Textbook and support materials were in the hands of teachers and students. Each site had a VCR for recording the lesson for review or for time-shifted viewing, and a hand-held portable telephone set specifically programmed for dialing into the Kansas State University Educational Communications Center.

Students in classes which participated in the live telecast had an opportunity to call in to KSU to speak to the instructor, or for paired interaction with partners from other schools. Several schools were selected each day to be the responding schools; the instructor then responded to individuals, using a class list to interact personably. Students who called in under this arrangement then became the "class" for direct interaction with the instructor.

The instructor used varied media and materials throughout the course. Focus on the textbook became a guide for the teaching partners and learners; the instructor was then free to bring in new material, native speaker assistants, and a rich variety of other means of demonstrating language functions, illustrating customs, clarifying situations, etc. The instructor also carried out immediate quizzes, planned unit testing and comprehensive standardized testing in the video sessions and by arrangement with the teaching partners in the classroom sessions without video.

With the aid of several assistants, the instructor graded quizzes, conferenced by telephone with students and teaching partners about problems and ideas, helped solve technical problems with the equipment, and planned for telecasts. There appeared to be a serious commitment to learning on the part of many of the students, with adequate controls to ensure measurement of acquisition of skills and knowledge. A comparison of results on a standardized test in the satellite course vs Spanish classes in a large secondary school provided some degree of assurance that the learners were accomplishing goals that the field sees as valuable.

BACKGROUND

This paper reports on an ongoing analysis of oral language interactions in several classrooms throughout the academic year. This focus reflects a major concern of experts in the field of language learning/acquisition. Earl Stevick refers to "productivity" (Stevick, 116-119), and Wilga Rivers to "autonomous interaction" (Rivers, 23) as the goal of language teaching; both terms include emphasis on individuals expressing themselves. The activities in a language classroom focused on communication as a goal, should include a progression toward this goal, which implies that the learners will be able to "produce" the utterances that they wish to use in order to communicate their ideas and reactions to another learner in an "autonomous" manner.

Whether the learner can produce utterances which he/she comprehends and which, then, serve the purpose of expressing his/her own thoughts, becomes a key concern. A major, unresolved question is whether, how and to what extent the mother tongue should be employed in second language instruction. According to Wolfgang Butzkamm, in a bilingual approach to the clarification of the semantic range of a term, much time and effort is saved: "The student immediately understands, nothing remains unclarified." (Butzkamm, 197) He goes on to emphasize that when there is a demand for avoidance of the mother tongue, the meaning of a text is often lost. (Butzkamm, 197) In a bilingually-oriented method, the goal of functioning well in a difficult linguistic situation without recourse to the mother tongue is the final goal. The degree to which the mother tongue can be avoided provides the basis for the measurement of the progress of the learner throughout the course. The use of the mother tongue gradually dwindles to insignificance.

How the mother tongue enters the activities of teaching becomes, however, of major importance. Can information be supplied in the written mode, thus preserving the aura of "immersion" in, for example, spoken Spanish. What is the impact of sounds in Spanish and the message in English coming together in the learner's mind? When is English required or when does the use of English enhance the learning of Spanish? Does the teacher ever speak English to a class of English speakers learning Spanish? If so, how much, and when?

To what degree should the analysis and drill of language structures (grammar) be driving the learning hour? Our students tell us repeatedly that their main goal is to be able to communicate in the spoken language. "Given the goal of communicative skill in our school language courses, our planning must involve not only the paradigmatic concern of the rules of usage as exemplified in a grammar of sentence structure, but also the syntagmatic concern of the rules of use, as they are being discovered in discourse analysis." (Alexander, 7) Cultural matters and interpersonal communication become at least as important as the study of form. An analysis of interaction should include attention to oral language, both as drill and as communication. Byrnes expresses hope that teachers will "view language not only as form but also as function, not only as product but also as process, and as a creative, interactive task performance rather than as an uncontextualized set of linguistic behaviors." (Byrnes, 128) Can we successfully integrate "creative, interactive" activities at all levels of instruction?

We often assume that instructors of a second language have common goals, and that the activities in language classes have a common base in purpose and means. The terms that catch our attention and appear to reflect reality seem to be easy to understand. However, instructors who are well prepared in other areas of language teaching may have little depth of understanding for the terms "skill-getting" vs. "skill-using", the "monitor", "i+1", "inductive" vs. "deductive", "grammar-translation" vs "TPR", "oral proficiency interview", "comprehensible input", etc. We now have many ways of "accelerating learning" through "communicative activities" in a "non-threatening atmosphere" where the "teacher" becomes a "knower" for the "learners".

And the upshot of all of these developments is a strong move toward the creation of a setting in which the beginning learner gains support in the study of language as primarily a skill. This setting, as I understand it, demands a period of emphasis on listening skills at first; and in all lessons there should be a wealth of utterances from the "teacher" that can be comprehended by the learner. Recent methods repeatedly emphasize the importance of a beginning period of listening exercises, with minimal demands for production. The lessons progress toward autonomy; the instructor floods the hour with comprehensible target language utterances. This apparently holds true for the introduction of any new skill.

Given the goal in beginning levels of an emphasis on listening and much to listen to in the target language, we can anticipate much use of the target spoken language in instruction. In order to discover the balance of oral events in language instruction, I have developed a tentative form of an interaction analysis tool. (Appendix A) This tool should be easy to use by laymen, and be easily interpreted by professional language teachers. The categories for analysis as currently reflected in the analysis tool are: Target Language vs. Mother Tongue (here: Spanish vs. English); Teacher vs. Learners; Individual Learner vs. Group of Learners; and Communication Interaction vs. Drill Interaction.

THE INTERACTION ANALYSIS TOOL

The interaction analysis tool proposes to answer the following questions in the situation presented here: 1) How much English vs. Spanish does the instructor use? 2) How much English vs. Spanish do the learners use? 3) To what degree are utterances actual communication vs. drill? 4) How often do individuals vs. groups speak? 5) What effect does increased or decreased use of English have on learning skills in Spanish?

We restriced ourselves to these questions, avoiding such questions as the incorporation of culture in the content, the use of various teaching techniques, the approach to grammar analysis, vocabulary learning, acquisition of language forms, etc. We would be pleased to get a clear answer to one aspect of the teaching/learning process in an accurate way: How much

English vs Spanish is used by whom and in what manner.

In Duff and Polio's study of the use of the foreign language in the classroom, they found that 71-100% of the students in classes "favored the current amount of English, regardless of what that amount actually was." (Duff and Polio, 158) That is, even in the case of an instructor who used the target language 100% of the time, students fully accepted the use of the target language. In the author's experience, students have welcomed the instructor's use of the target language to the exclusion of the mother tongue in all spoken communication; they may request mother tongue explanations, but remain satisfied with target language explanations and/or written mother tongue explanations. Of course, they have textbooks with mother tongue explanations available, and colleagues who can often clarify a matter for them using the mother tongue. In an interview of a teaching partner for Spanish by satellite, the author found that the students in that teaching partner's class "perked up" when the instructor resorted to using only Spanish, and the students were "more attentive". She found no adverse reaction.

Given these anecdotal, qualitative and quantitative research data, one can assume that a goal of 100% use of the target spoken language and 0% use of the mother tongue in instruction is not only attainable but desirable. The following is a report on a study of the measurement of what amount of Spanish vs. English is used, how and by whom. An analysis of the contribution of the balance of Spanish vs. English to the acquisition of skills and knowledge is reported as a secondary matter.

THE STUDY

During the academic year 1989-90 several persons in varied circumstances used this tool to record interactions in Spanish by Satellite from Kansas State University. Secondary school learners in six states received the Beginning Spanish program by satellite dish under arrangements with Midlands Consortium, a group of five Mid-Western states. Due to several problems connected with the start-up of an entirely new and newly-conceived program, the authors ran into roadblocks that precluded a large database. Of the 70+ schools, 22 agreed to participate, and 7 actually participated to some degree in the trial of our interaction analysis tool; each of the 7 schools had one or more persons willing to serve as tallier during some or all of the video sessions. In one case, one tallier recorded data throughout the year. In the others, more than one person served as tallier.

Thus, this research is perceived as reflective of approximately 10% of the schools. By concentrating on one aspect of the analysis which generated an adequate amount of data, we can perhaps draw a valid conclusion about the language teaching situation. This one aspect is the amount of English vs. Spanish spoken by the instructor vs. the learners.

Table 1 clarifies the categories of the Complete Tally Data reports, which are compilations of data generated by the Tally Sheets. (Appendix B) The talliers received a copy of the Guidelines (Appendix C) and had access to and received calls from one of the authors, the graduate research assistant, who organized the collection of data. The graduate research assistant mailed notes of explanation to all talliers when there were questions from individual talliers.

In addition to the talliers in the schools, five persons at KSU, including the authors of this paper, tallied from the video broadcast, i.e. in a non-classroom setting. One teaching partner tallied during one semester (#401 in the data sheets).

Talliers could be any person available. Skills in Spanish ranged from none to native speaker.

The schools were encouraged to find a student who could tally as a special activity in lieu of study hall or some other non-class activity. The high school student talliers received no compensation or credit. We encouraged them to record a variety of sessions, if not all sessions. The response to this was mixed. Out of 70+ schools, 22 agreed to assist with the research, and 7 actually submitted completed tally forms. Of these 7, 2 tallied throughout the year. School #2 (as listed in Appendix B) recorded only non-broadcast days; and School #6 recorded a mix throughout the year. The number of sessions recorded ranged from 6 sessions by School #2 to 103 session by School #6. (CHART 1) In School #1 several students shared tallying duties, resulting in 11 sessions tallied.

Thus, it becomes evident that we have approximately six talliers who tallied often enough to gain some degree of skill: #107 (23 tallies); #113 (23); #114 (103); #201 (14); #202 (10); and #301 (6 tallies). The last listed tallier, #301, is one of the authors, a university professor, who has carried out many applications of this form in other settings, and should thus be included in this set.

ANALYSIS OF RESULTS

Column #24 of the Complete Tally Data, of the Total Scores by School/University, and of the KSU Talliers Compared (all are in Appendix B; See: Chart 2 Column Codes) give an immediate overview of the total utterances, which is then given as a percentage of the use of English compared to Spanish. Column #16 of the Total Scores by School/University, %ET, gives the percentage of English compared to Spanish as used by the instructors (telecast instructor and in-class teaching partner).

The dates that are followed by a bullet in column #16 of the Complete Tally Data sheets indicate the sessions that were telecast days. It becomes evident that many sessions conducted by the teaching partner alone (non-telecast days) showed an equal amount of Spanish drill and communication to the telecast days. One can assume in these instances that the teaching partner fulfills the role conscientiously, carrying on from the instruction of the telecast to work with the students in the classroom.

For example, compare the data for tally sheets #150-155 for School #6. The use of Spanish by the Teaching Partner in-class and by the Television Instructor indicates significant use of Spanish by the Teaching Partner (TSD, Column #3 - Television: 42, 27, 40; Teaching partner: 10, 29, 27; TSC, Column #4 - Television: 97, 53, 52; Teaching partner: 81, 53, 20).

As a comparison to these results, see the data for tally sheets #130-135, also from School #6. The use of Spanish by the Teaching Partner and the Television Instructor indicates a stark contrast in the greater amount of Spanish used by the Television Instructor (TSD, Column #3 - Television: 12, 54, 33; Teaching Partner: 8, 33, 0; TSC, Column #4 - Television: 138, 88, 104; Teaching Partner: 28, 7, 5).

Several questions arise. Is the Teaching Partner gaining skill in Spanish, and thus becoming comfortable with using it in instruction? (#150-155 vs. #130-135 reflects later vs. earlier sessions.) Did the Television Instructor employ a different method? Was the content a determiner of amount of utterances? Were there writing activities on the non-television days that precluded attention to speaking drill?

The data in other columns reflect the nature of activities in these class sessions on non-telecast days. For example, Tally Sheet #132 indicates significant amounts of drill in Spanish with group and individual responses (Columns #5 GSD 14, #9 ISD 85). The activities noted by the tallier were "Grade workbooks. Review for test. Practice quiz. Grade practice quiz." These activities can generate significant amounts of use of the target language. The low number of instructor utterances in session #134 is more than balanced by the high number of learner communication tallies, both group and individual (Columns #6 GSC 201, #10 ISC 176). The activities noted by the tallier are "Review, to work on verbal communication. Bingo.' The game was evidently generating much communication, and, we could surmise, of a very lively and involved manner.

In light of the untenable nature of any immediate response to many questions, we restrict ourselves to a closer look at the amount of English employed by the instructors and by all. These results are presented in Column #24, representing all utterances (instructors and learners) and in Column #16 for instructors only (Total Scores by School/University).

The scoring by KSU talliers #201 and 202 indicate the validity of the scores, in that they tallied a significant number of sessions and agreed closely. As an overall percentage, which is given in row TOTAL 1-7 (51%), one sees that there is agreement with the results of these two talliers (53%). On balance, then, we can indicate a usage of English vs. Spanish in the range of 50%, +/- 2%. The result of Column #16, Total 1-7, of 59% English, indicates more English generated by the instructors than by the learners.

It is of some interest that one of the authors, #301, the professor, registered higher amounts of use of English. This may be explained by his determination of what constituted an utterance. For the most part, the lay talliers marked for each complete utterance, which may have included several subordinate phrases. The practiced talliers marked more utterances in English than the lay talliers, as they became aware of the complexity of utterances and began to deal with the question of "What is an utterance?" The "professional" tallier, the author, marked for significantly more utterances, by tallying each independent verb in any one long sentence. The nature of this question of utterance definition became the main topic of discussion at a laboratory session on campus involving two teaching partners, one student tallier, and the authors. After several trial runs with video clips and discussion of our understanding of the term, "utterance", we became able to tally with results that were equal or nearly equal. In the intensive discussion of this problem, we also encountered the question of whether an utterance is "drill" or "communication". The latter question was only partially resolved.

The laboratory session on campus generated ideas that can lead toward a revision of the Interaction Analysis Sheet, and of the Guidelines for the sheet. These ideas will be studied, given a trial run, and reported on in future writings.

CONCLUSION

The interaction analysis tool was successfully employed throughout the school year by one student in School #6, by a student and teaching partner in School #3, over a span of three months by a student in School #5, and by two graduate students at KSU. These persons gained enough practice in its use to generate data that represent agreement when compared with one another. When all tallies by all talliers are computed for percentage of English vs. Spanish in classroom and by television, one finds an average of 51%, which is closely aligned with the results of the three talliers with most experience and agreement in results: #107, #114, #201, #202, and #401. A redefinition of the term "utterance" may change this percentage to a higher amount, if the definition of tallier #301 is assumed. In contrast to the data on all utterances generated by students and instructors, the same talliers stay close together in their results on the amount of English used by the instructors: 59%. This is perhaps a surprising result for many persons, who would assume that the learners would use more English than the instructors. Or this may be no surprise to those who attempt to maintain a focus on student activation of target language skills.

The tool can apparently be used by teachers either from recordings of the classroom session or by having a student serve as tallier. It becomes useful in demonstrating for the teacher in concrete data the amount of, and, when the tallier is capable of discerning drill vs communication, the type of utterances in the mother tongue and the target language. In the author's experience, teachers have often been surprised to see the results, interpreting the data in their own manner. Sometimes they have been surprised at the amount of target language that was generated; at other times they have been surprised about the amount of mother tongue that was used.

This has been one small step toward a refinement of a tool that can be easily used and easily interpreted, that reflects all utterances during the class session, and that demands very little preparation of the tallier before use of the tool.

ENDNOTES

1. Charles Thorpe, Instructor of Spanish at Kansas State University, developed the curriculum, organized the on-camera activities, and taught the lessons. He has a full-time position with the Educational Communications Center at KSU.

2. The research for this paper was funded by the Midlands Consortium Star Schools Project and by Kansas State University.

3. The instructor of the Spanish by Satellite class arranged for the end-of-year standardized achievement test provided by the textbook publisher to be given to his students (559) and simultaneously to a larger, non-rural school traditional Spanish program's students (118 in three classes). The latter was using a different textbook, and the test included only written items. The Spanish by satellite students scored an average of 75%; the traditional students 55%. This indicates mastery of the subject matter and at least acceptable comparison with a traditional classroom program. There are many variables that prevent one from basing additional conclusions on this data. However, with 14% of the Spanish by Satellite students scoring above 90%, one can assume that a commendable degree of learning is taking place. During the authors' observations of telecasts, in which students come on line to interact with the instructor, they noted that the learners became comfortable with expressing themselves in Spanish. The authors arranged for several schools to videotape sessions and send them to us; we could then observe that the students indeed were responding to the monitor and interacting with the teaching partner and each other in Spanish.

4. Laboratory session of May 22, 1990 on the KSU campus with Melanie Myers, teaching partner from Frankfort High School, Frankfort, KS; Kathy Hamman, teaching partner from Yates Center High School, Yates Center, KS; Cassie Morrison, student tallier from Yates Center High School, and the authors.

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APPENDIX A: Interaction Analysis Form

APPENDIX B: Complete Tally Data sheets

APPENDIX C: Guidelines to the Interaction Analysis Form

Chart 1: Number of sessions recorded by each tallier/school

Chart 2: Column Codes

TEACHER AND STUDENT INTERACTION TALLY SHEET

	SPANISH		ENGLISH	
	DRILL	COMMUNICA.	DRILL	COMMUNIC.
TEACHER				

		DRILL	COMMUNICA.	DRILL	COMMUNIC.
STUDENTS	GROUP				
	INDIVIDUAL				

SCHOOL: ____________________

CLASS ________ Number ______

Date ____________

Marker: ____________________

Instructor: ____________________

ACTIVITIES

APPENDIX C

MIDLANDS CONSORTIUM STAR SCHOOLS RESEARCH PROJECT

<u>Classroom Interaction in Spanish by Satellite and Methodological Factors</u>

Dr. Loren Alexander, Kansas State University

GUIDELINES FOR THE TALLY SHEET

1. The Marker should read these guidelines carefully, then refer to them frequently during the first sessions of marking. The marking task demands full attention, and it is assumed that you will gain skill through practice. You need not know any Spanish; you need merely recognize the difference between Spanish and English, and to decide whether you think the interaction was basically drill or communication.

2. Fill in the information requested in the upper right corner: The name of the local school; The name of the class, i.e. Spanish A or B or other title given to the class; The number of students in the class; Your name; The name of the person teaching the class (by satellite or the teaching partner's name).

3. You will be marking a tally for Spanish and English utterances, and for physical responses to oral commands. Tallies should be grouped by fives: 𝍸 𝍸 || (physical responses) <u>𝍸 𝍸 𝍸 ||</u>

4. Note that the boxes at the left of the sheet form a pattern: The <u>teacher's</u> utterances are marked in the top boxes; the <u>student</u> utterances in the lower boxes.

5. <u>Teacher's utterances</u>: Mark every utterance, differentiating between drill and non-communicative asides (in the "Drill" columns), and utterances that are intended to communicate with the learner (in the "COMM" column). Use your best judgment to determine whether the teacher is communicating or drilling.

6. <u>Student utterances</u>: Tally only those English utterances that are directed to the teacher, i.e. avoid tallying English interaction among the learners. Tally all Spanish utterances that are part of conversation or drill with the teacher, or conversation or drill with a student when this is a focus of the full class. Do not attempt tally conversation between students who are not the focus of attention of the full class or who are not in conversation with the teacher. When small groups work by themselves, indicate this as an activity in the column to the right ("Activities"), and cease tallying; tally only those small groups which work directly with the teacher and which you can tally easily.

(over)

7. You will find that keeping track of all of these tallies becomes rather easy within a few minutes. The one main disturbing factor for the marker is to become 'involved' in the content of what is being said, which leads to distraction from the task of tallying. One must concentrate fully on the marking procedure. Keep fully attentive on your task continually.

8. During pauses, or at other appropriate times, make very brief notes in the 'Activities' column about the kinds of activities that are taking place in class. Indicate such things as dialogue presentation; grammar drill; vocabulary explanation; memorized lists or sets; and other terms that you wish to use to characterize the activities. Note especially those activities that last a few minutes; quick moves from one momentary activity to another need not be noted.

9. Begin marking with the official beginning of the class session; cease marking at the official end of the class session, i.e. at the bell.

10. At the conclusion of the marking period count up the tallies in each box, write the number in arabic numerals and circle this number.

11. Double-check the information at the top right. Indicate any variation from a standard length of class session. Hand the completed tally form to the teaching partner.

12. Thank you very much for your assistance. You will be contacted by the scorers at KSU to explain anything that I leave unexplained. You may also call them or me. Please refer to the information that you receive from your scorer for time to call and the telephone number she/he wishes you to use.

8/89

Chart 1

Number of Sessions Recorded by Talliers

School	Tallier	Number of Sessions Tallied
1	100	3
	101	2
	102	2
	103	1
	104	2
	105	1
2	106	6
3	107	23
	401	31
4	108	2
	109	1
	110	1
	111	1
	112	2
5	113	23
6	114	103
7	201	20
	202	10
	203	2
	204	6
	301	10

Chart 2

Column Codes

On the Form: Total Scores by School/University (Other forms #15-18 vary, see note on each below)

1. TSD Teacher Spanish Drill
2. TSC Teacher Spanish Communication
3. TED Teacher English Drill
4. TEC Teacher English Communication
5. GSD Group Spanish Drill
6. GSC Group Spanish Communication
7. GED Group English Drill
8. GEC Group English Communication
9. ISD Individual Spanish Drill
10. ISC Individual Spanish Communication
11. IED Individual English Drill
12. IEC Individual English Communication
13. #Ss Number of Students in class
14. TST Total Spanish Teacher utterances
15. TET Total English Teacher utterances
16. %ET % of English Teacher utterances
    TST (other forms) Total English Teacher
17. TS Total Spanish utterances
    TET (other forms) Total Spanish Teacher
18. TSS Total Spanish Spoken
    %ET (other forms) % English Teacher
19. TSH Total Spanish Heard
20. /SP Average number of SPanish utterances by students in each session
21. /SIS Average number of Spanish Indiv drill utterances in each session
22. ENG Total English utterances
23. TOT Total utterances
24. %ETS % of English utterances

H. MINIGRANT REPORT -- Rosemary Talab and Robert Newhouse

Survey of the Kansas Distance Learning Teaching Partner and Principal

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A Study of Roles, Tasks, Training, and Receptivity to Technological Change

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by

R. S. Talab
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Midlands STAR Schools Regional Consortium
October, 1990

ABSTRACT

The key roles and tasks of Kansas distance learning teaching partners, the extent to which they viewed themselves as change agents, how this affected their perceptions of themselves as they implemented technology, key elements of successful training, and a composite profile were the areas of inquiry. Two surveys were constructed: 1) a 112- item Teaching Partner mail survey (n = 33) and 2) a 7-item phone survey of a random sample of 1 in 3 Principals of Teaching Partners (n = 12), all of whom had participated in the Spanish I program for a full year. Descriptive statistics and correlations were used in data analysis. It was found that 70% of teaching partners viewed themselves as change agents, and that those who viewed themselves as change agents valued different parts of the satellite teaching/learning experience than those who did not. Teaching partner interactions with students, the studio instructor, and satellite program personnel were a major factor in training and implementation success. The main tasks for a teaching partner were the same as for a traditional teacher, although the emphasis in being a teaching partner was on classroom management.

K-12 Distance Education in the United States

> The more I study the history of innovation in schools, and the more I get to schools and talk to teachers, the more I realize the astounding political naivete in our [technology] industry. We think we can take a technology, even one that works, inject it into schools and thereby revolutionize education. But when external groups develop wonderful things and try to put them in schools, they disappear. They never get replicated... the Rand Corporation's study of innovations in education said that any innovation in schools will fail if it doesn't take into account the complex social structure of the schools, and it must put the teacher at the dead center of the loop (Tom Snyder as cited in Olds, 1988).

Distance education programs have shown a dramatic increase in a short period of time. In 1987, fewer than 10 states were promoting distance learning. One year later, two-thirds of the states in the United States were involved in distance activities (Office of Technology Assessment, 1988). Interactive satellite broadcasts for K-12 instruction are now received by more than 1,200 schools in more than forty states (Barker, 1989).

Several studies have noted the research needs for K-12 distance education: competent teachers, valid instructional models, and instructional support (Eiserman, Williams & Williams, 1988; Speth, Mercer, and Poggio, 1990). Nearly all this research has been directed at course effectiveness. Another area in which research needs to focus is distance learning facilitator effectiveness, the numbers and importance of which will increase as interactive telecommunications become more commonplace in the school (Paul, 1990). Only two studies in the United States have examined the roles and tasks of the distance learning facilitator within the structure of the study (Hobbs, 1988; Hobbs concerns were voiced in the same priority. By any indicator the teaching partner is critical to successful distance learning.

The Teaching Partner as Change Agent

Meaningful adoption of distance education can occur only when teachers and administrators become partners in innovation (McDonald and Naso, 1986). However, in the majority of cases it is the administrator who is more favorable toward acquiring distance learning than the faculty (Hobbs and Osburn, 1988).

Bandura (1977) suggested that people develop beliefs concerning their own coping capabilities, which he called "self-efficacy." Numerous studies investigating teacher efficacy beliefs suggest that efficacy beliefs may account for individual differences in teacher effectiveness (Armor, et. al., 1976; Berman and McLaughlin, 1977; Brookover, et. al., 1981). Correlational data suggests that teachers with high teacher efficacy beliefs develop and maintain a supportive classroom environment (Gibson and Dembo, 1984). These behaviors are typically those of teachers classified as effective (Brophy, 1979; Good, 1979; Riggs, 1988).

The extent to which a belief is internalized influences the value of an endeavor to that teacher, therefore increasing that teacher's effectiveness. Applying this theory to the adoption of new technology, then the extent to which a distance facilitator internalizes the role of change agent (Rogers and Shoemaker, 1971) in the use of this technology the more likely that distance facilitator is of displaying effective behaviors as a teacher.

available to complete the survey.

A seven-item phone survey of 1 in 2 principals (n = 12) completed in May, 1990, utilized likert-type, closed or forced-choice, and open-ended questions. While 27 principals participated, two of them also functioned as teaching partners, and so were excluded. The response rate was %100.

Data analysis included descriptive statistics, and Pearson Product Moment correlations. Fowler (1984) and Dillman's (1978) recommended procedures for survey construction and evaluation were followed. Data was analyzed using the SPSS-X statistical program.

Results

Mean demographic response data for Kansas distance learning teaching partners provided the following composite: a person who had a master's degree, was appointed to the position, had been employed 6-10 years as a teacher with most of those years at the present school, was 35-44 years of age, female, had five other preparations besides Spanish I, participated one academic year in the program, and did not speak any other language.

Teaching partners perceived their contributions to be important and well-received (figure 1). They saw the utility of learning Spanish along with the students and were generally enthusiastic about being a teaching partner and believed that their colleagues valued this service that they rendered.

Training, Tasks and Responsibilities

On a 17-item, 5-part likert scale section, with 4 being

(1.4), motivating students (1.5). lecturing (1.6), and curriculum design (1.6). The three main (mean) tasks in conducting a satellite class were: maintaining class discipline (1.5), motivating students (1.6), keeping students on task (1.7), and supervising class activities (1.9). This indicates that while the both groups of teachers had the same primary tasks the satellite teachers are more responsible for classroom management, a finding similar to the two Hobbs' studies.

<u>The Teaching Partner as Change Agent</u>

When asked if they felt as though they were change agents, 27% responded "yes", 43% responded "somewhat", 20% responded "not sure", and 10% responded "no". When asked if they were comfortable with introducing new technology, 70% responded "yes", 20% responded "somewhat", 7% responded "not sure" and 3% responded "no".

The degree to which the teaching partner perceived him/herself as a change agent was a powerful measure of relationship (figure 4), in that it correlated with many other variables ($p = .05$). Pearson Product-Moment correlations for the teaching partner seeing him/herself as a change agent were calculated with four main groups of variables: 1) the value of the satellite teaching/learning experience, 2) the contribution of the teaching partner training, 3) role perceptions as a teaching partner, and 4) attitudes toward the introduction of new technology. The relationship between seeing oneself as a change agent and between both training activities and the value of the staff member", "instructional leadership", "classroom leadership", and "available", indicating that the principals chose their teaching partners because of their overall superior abilities as a teacher.

Discussion

The results of the value of the satellite teaching/learning experience and those of teaching partner training reveal interaction--between the students and the satellite instructor or networking with other teaching partners--was an important aspect critical to the teaching partner's perception of the success of the program.

The relationship between the perceptions of the teaching partners on the need for the use of a technology and their evaluation of it's effectiveness was quite apparent from the many relationships between teaching partners who perceived themselves as change agents and other measures. These answers could be used as the basis for constructing an instrument for ascertaining the conditions necessary for effective teaching partner training, course support, and for enhancing the degree to which a teaching partner would be committed to change. It is likely that for any technology to be introduced and accepted by those not technologically inclined the following must happen:

1) hands-on training that involves a high degree of interaction,
2) the opportunity during televised lessons to interact regularly between the students,

Figure 1
Teaching Partner Role Evaluation

0 for "Strongly Disagree" to 4 for "Strongly Agree"

Item	X Response
Learning Spanish along with the students improves learning commitment	3.8
My initial feelings about participation in the satellite class were favorable	3.8
Serving as a teaching partner is an activity which is generally well accepted by colleagues	3.6
I would volunteer to participate in another satellite class	3.6
Satellite teaching is generally well accepted by my colleagues	3.5
Being a teaching partner has improved my relationship with my principal	2.9

Figure 1
The Value of the Satellite
Teaching/Learning Experience

"0" for "very high" to 4 for "very low"

Item	X Response
Student-Satellite Instructor Interactions	2.7
Preparation of Students	2.6
Teacher Partner Training	2.5
Local Site Technical Support	2.5
Satellite Campus Coordination	2.5
Local Site Administrative Support	2.4
The Local Classroom Environment	2.4
Studio Instructor-Teaching Partner Interactions	2.3
Assignments	2.1
Computer Software	2.1
Opportunity to Meet Satellite Instructor	2.1
Student-Teaching Partner Interaction	2.0
Televised Lessons	1.9

Figure 3
Ten Most Important Tasks for Traditional and Satellite Teaching

0 for "critical" to 4 for "very unimportant"

Traditional Responsibilities	X
Maintain Class Discipline	1.4
Motivate Students	1.5
Keep Students On Task	1.6
Lecture	1.6
Prepare Course Content	1.7
Curriculum Design	1.7
Answer Students' questions Outside of Class	1.7
Answer Students' Questions During Class	1.7
Supervise Class Activities	1.7
Lead Class Discussion	1.7

Satellite Responsibilities	X
Maintain Class Discipline	1.5
Motivate Students	1.6
Keep Students on Task	1.7
Supervise Class Activities	1.9
Operate Equipment	2.0
Prepare and Grade Assignments	2.0
Distribute and Collect Exams and Assignments	2.0
Prepare and Grade Exams	2.0
Distribute and Collect Course Materials	2.2
Prepare Equipment	2.2

Figure 4
Correlations between The Teaching Partner as Change Agent And Other Measures

Item/Change Agent	P Value
Training Activities:	
Discussion of the Course with Professor During Training	.005
Phone Help	.024
Operating Equipment	.029
Live Demonstration of Entire Uplink/Downlink Process	.043
Value of Satellite Teaching/Learning Experience:	
Computer Software	.001
Teaching Partner Manual	.003
Satellite Campus Coordination	.003
Studio Instructor-Teaching Partner Interactions	.003
Student-Satellite Instructor Interactions	.012
Assignments	.014
Local Site Technical Support	.029
Opportunity to Meet Satellite Instructor	.029
Student-Teaching Partner Interactions	.054
Teaching Partner Role Experience:	
Serving as a Teaching Partner is an Activity Which is Generally Well Accepted by My Colleagues	.021
I would volunteer to Participate in Another Satellite Class	.021
Other Selected Measures:	
Introducing New Technology as a Result of Being Teaching Partner and Using Distance Education Technology	.009
Years as a Teacher	-.019

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I. MINIGRANT REPORT -- Robert Hohn and Mark Byrne

The Introduction of Satellite Television in Kansas Rural Schools: Two Intensive Case Studies

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submitted to

The Midlands Consortium Star Schools Project

Abstract

The purpose of this study was to follow the changes which occur in two rural schools during their first year using satellite television. An intensive case study was done of two classrooms based on an ecological approach. Six individuals, three of whom were categorized as high in motivation and three as low in motivation based on questionnaire responses and school personnel referrals, were targeted for specific profiling. All six individuals were using television to learn for the first time; four students studied science courses and two studied a language course. An account is provided of their adaptation to the new technology based on their grades, their satisfaction with the course, information from informal diaries written periodically, and observations of their behavior in the classroom. The description of the setting includes information based on teacher comments, comments from other members of the class, and organizational variables pertinent to using the new technology such as allocation of resources and changes in scheduling. The objectives of this research were to identify successful adaptive behavior to new technology, to add to theories of technology and learning, and to provide a description of the social environment influencing adaptation.

Learning a Language and a Science from Television:

Two Intensive Case Studies of Kansas Rural Schools

The last few years have seen a huge investment and increasing interest in distance learning, notably a $100 million commitment from the U.S. Congress to finance the development, transmission, and research of education by satellite particularly in the areas of science, mathematics, and foreign languages. Most distance learning papers address field work such as individual case studies; a few have attempted more formal experimental manipulation of variables. One factor they all lack is a strong theoretical foundation to draw together the various characteristics making up the experience of satellite learning. Instead, models and explanations have been borrowed from traditional learning theory. As an academic field, recognized as separate from main stream education and psychology, distance learning is only starting to appear as a research topic.

This research is in the field of distance learning, addressing the relationship between learner characteristics, program content, and achievement. It is a grassroots study examining the role of technology in the classroom, and how it might serve the needs of students in contrast to the traditional classroom approach. Although there are few cases studies to date, a physical presence in the learning environment and an empirical analysis are combining knowledge gain, engagement in communication, technical features, and and user acceptance seem crucial to understanding the dynamics of learning at a distance (Dohner, Zinser, Cullen, & Schwarz, 1985; Minnis, 1985; Sheingold, Kane, & Endreweit, 1983).

Distance learning is characterized by a setting in which the teacher and students are physically distant from each other at remote sites. The reasons such a situation may arise are many including the remoteness of an off-campus location, lack of money to provide an alternative program, and sparsity of populations in the immediate area who are seeking instruction in a given content area. It necessarily implies the utilization of technology to deliver content to the student.

The purpose of this paper is to look at an old problem in a new setting: the relationship between characteristics of the learner and program content, and the classroom environment in which this interaction takes place. The difference is that the curriculum will be presented by television, using a distant teacher with whom, on rare occasions, the student may interact by telephone. The focus of interest will be to examine differences in achievement and classroom behavior between students categorized according to their level of motivation and presented with either of two types of content: one, a course in Spanish, the other, science courses in astronomy and marine biology. If differences in achievement, classroom behavior, and course satisfaction are found, future research can then address the question of whether these same differences exist when the material is presented in a traditional classroom setting.

Background Issues: Justifying Research on Distance Learning

A review of the literature indicates that our current knowledge of the interaction between a given medium, the characteristics of the viewer, and the classroom setting, is limited (Duchastel, Brien, & Imbeau, 1988). It is clear from a review on distance learning (Byrne, Speth, & Poggio, 1989) and examples of individual case studies (Johnson, O'Connor, and Rossing, 1983) that the student learns equally well from a televised presentation as a face-to-face classroom encounter with a teacher. What we do not know is how a student's achievement, classroom behavior, and course satisfaction differ depending on level of motivation and aptitude when the course is presented via interactive media, and when the course content differs.

Most of the excitement surrounding the development and implementation of new media is focused on the 'how' rather than the 'what' of transmission. There is always the hope that some intrinsic feature of the machinery will directly affect the quality of learning and solve problems in the classroom in a more efficient manner. Part of the fault for this attitude must be laid at the feet of those responsible for the production of both software and hardware, and their advertisers. Selling technology to the educational community, especially the individual student, is usually a higher priority than verifying the quality and benefit of the instructional content.

However, it is important to note how many of the features of an attractive program such as music, fast and concise delivery, and unusual visual features, primarily designed to make it attractive to the buyer, are the very features which enhance learning and recall. The design of this research will cast light on whether some of these design variables are important, and if they result in differential benefits to the student depending on their learning style.

<u>The problem of theory</u>. During the last ten years some theories on learning and technology have appeared, long after the learning

effects were reported (Perraton, 1987; Wiesner, 1983). It is strange that these theories have taken so long when many authors note how ideal many of the new media are for studying learning (Papert, 1980; White, 1983). The most popular of these theories centers on the cognitive events initiated and fostered by a particular symbol system contained in some medium (Clark & Salomon, 1986). However, a simple relationship has not yet been established between a characteristic unique to a medium (e.g. television) and a corresponding cognitive skill (e.g. synthetic thinking).

Rather than isolating a single skill for a given medium, we can say that many cognitive skills may be affected because of a common dimension, and by attributes of the medium which are shared with traditional materials such as the chalkboard. This partially explains the similarity in achievement outcomes between students taught in a traditional manner and those studying at a distance using advanced technology. But saying the medium is not an important variable does not make a great deal of sense. Surely there are things which can be illustrated on a television set, using expert teachers, which would affect learning differently from the limited conditions of the classroom? Maybe the design we need to study is not one based on a 'same content, different medium' paradigm but rather the three way combination of different content, same medium, different learners. This means that combining three factors - differences in learners' approach and motivation for the tasks, the medium, and the content of the program - may be the chemistry for differences in achievement. Although the medium is the same in both conditions, we need to be aware that the same medium can be more effectively used depending on the objectives of the television teacher. For example, the student can be introduced to Spaniards speaking their language in a natural setting, an experience not available in the normal classroom; a cognitive approach puts heavy emphasis on learning in a meaningful, applied context.

It is interesting that extensive research in cognitive skills and media attributes has not produced a host of exciting outcomes accountable only to the emergence of new technology. We need to attend to an important lesson; Wilber Schramm of Stanford University summed up the situation back in 1972 (cited in Baldwin, 1987, p. 41):

> At least two straightforward guidelines stand out from the research papers we have reviewed. Effective television can be kept as simple as possible, except where some complexity is clearly required for one task or another; students will learn more if they are kept actively participating in the teaching-learning process. Simple television: active students.

'Simple television' is, unfortunately, a relative term as is 'active students'. This paper will focus on the television teachers' style, and relate it to observations of the students' activities during the lesson. We can then examine outcomes and decide if such a thing as 'effective' television actually exists, for nothing in the research shows there are criteria differentiating it from something called 'ineffective' television.

The work of Olsen and Bruner (1974) and Salomon (1971) has been the major thrust in linking learning characteristics to different media. The assumption is that since a distinction exists between the content of a message and the means of transmission then learners will respond differently to the same information. A concept can be understood in many ways using different metaphors and be enriched through different sensory modalities. The theory holds that if each of us represents ideas in different ways and with varying degrees of enrichment then different media will be suited to each learner depending on what interpretative skills are present (Brown, Nathenson, Kirkup, 1982). Such a promising assumption has not been found to be the case: the content of the message and the means of transmission is surprisingly robust across different learning styles. The important question is not whether different media will be suited to different learning styles, but rather if the medium, combined with a particular instructional design or course content, is the key element in differentiating levels of achievement. We cannot assume that control over pace, amount of practice, and style of instruction mediated by a machine is equally beneficial to all learners (Gay, 1986).

The outcome so often reported indicating no great differences between traditional methods of teaching and teaching by various technologies has been supported by a comprehensive theory of instruction posited by David Olsen (1972). He asks the question why instructional methods with different topographies -such as modeling, verbal teaching, or providing for the discovery of contingencies in a child's environment - can result in the same knowledge. What he demonstrates is evidence of an equivalence of forms of instruction; the model holds that methods of teaching can have different surface characteristics, for example, television or face-to-face presentation, but the learner has an invariant set of cognitive processes. This implies that the intellectual outcomes observed in a classroom are not necessarily directly attributable to the instructional method used. Unlike a strictly controlled experiment in which we could observe some of these instructional methods and their interaction with cognitive processes, direct observation was used in this research to identify adaptive behaviors of students; successful adaptive behavior can then be related to intellectual outcomes. Natural observation is not concerned with what people *can do* under ideal conditions but what they *actually* do when given the opportunity to freely respond. We know students can learn as well through one type of medium as through another (Cohen, Ebeling, & Kulik, 1981), especially the high motivated student, but we do not know how the medium might enhance motivation.

Most theories related to effective learning in the traditional classroom are applicable to learning by technological means and do not benefit from any expansion to include particular characteristics of the medium in question. For example, establishing a learning set by the use of an advanced organizer (Ausabel, 1960, 1978) has been demonstrated as a reliable means of increasing comprehension and retention. It is obvious teachers should use the same tool when they are using a computer or appearing on television. Another example from Brown, Nathenson, and Kirkup (1982) and their evaluation at the Open University in Britain has show that it is important for teachers to be clear about the objectives of a program, but also that these objectives be communicated to the student well in advance whether or not this communication takes place face-to-face or at a distance.

There is an expectation of differences when one considers the structure of presentation. Research in the classroom has produced results indicating differences between cognitive and behavioral types of instructional design (Schramm, 1964). As long as learners are below a certain level of sophistication in terms of learning achievement (e.g. high school students show stronger effects than college students), or when the material is sufficiently lengthy and difficult (such as a foreign language), carefully sequenced instruction produces more learning than instruction presented randomly or in some nonoptimal sequence.

In contrast, studies comparing programs that require learners to respond actively and repeat key words and ideas with programs that do not require much observable behavior other than passive attention by the student have indicated differences favoring the passive learner (Tobias, 1973; Abramson & Kagen, 1975). Cognitively oriented theorists interpret the findings involving non-sequential presentation of information as evidence that incongruity stimulates discovery learning, and interpret the finding showing superiority of passive attention over active responding as evidence of the futility of trying to make learners conform to logic imposed by someone else rather than letting them encode and organize according to their own rules.

These results may hold for college level students who can learn efficiently through reading and may tolerate delay of feedback without loss of learning efficiency. However, in the early grades students appear to benefit from the step-by-step sequencing of learning objectives and the frequent opportunities to make overt responses and get immediate feedback which are vital features of the behavioral design (Kulik, Cohen, & Ebeling, 1980). The question remained whether these differences would be found among the high school students selected and how these differences would relate to the structure of presentation on the television.

Technology and Instruction: Designing an Education Program for Broadcast

An important distinction needs to be understood regarding the difference between 'technologies of transmission' and "technologies of instruction' (Richardson, 1983). The former refers to how the message is transmitted be it morse code or hot air balloon. But the latter is a list of strategies, supported by research, and demonstrated to be effective for learning. They include 1) building movement, color, and humor into a program, 2) providing clues in science programs which facilitate discovery, and 3) reinforcing, priming, shaping, and motivating. This paper will deal with the technologies of instruction and control for the method of transmission effects by having subjects use the same media:

> the most important issue, seldom addressed by instructional technologists, is which of the many instructional methods which are available should be transmitted by an instructional medium. This decision rests less on the technology of transmission than on our current knowledge of instructional research and development. (Richardson, 1983, p. 10)

The first variable of interest in this study is the instructional content. Three types of educational television programs were examined because of their differing content. One program was an introductory course in the Spanish language. the other two were sciences - an introduction to astronomy and to marine biology. The instructional design features of both programs such as direct lecturing, use of support material. and other learning principles were examined but the designers and producers did not select a single theoretical approach from educational psychology in developing either of the broadcasts. However, we were careful to monitor the content of the programs in our classroom observations because instructional systems are completely dependent on the content quality of the instructional materials if effective learning is to result (Dejoy & Mills, 1989).

Technology, Achievement, Attitude, and Motivation

Classroom grades, attitudes, in-class behavior, and motivation are the four dependent variables in this research. There are two reasons for examining these learning outcomes based on differing content and the behavior and interest of the students. The first has to do with the concern of parents and educators over the amount of time young children and high school students spend watching television or playing computerized games, and the rapid introduction of new technology such as computers to the classroom (Clark & Solomon, 1986). Are there generalizable effects from prolonged exposure to, or interaction with these media?

The second interest focuses on motivation. In the history of instructional design the role of motivation has always been recognized as an essential component of effective learning. The sources of motivation have generally been divided into extrinsic sources based on behavioral theory and intrinsic sources from cognitive theorists. The interesting point about instructional design features of educational software is the idea that aspects of a program which are fun may also be powerful facilitators of learning. Malone (1980, 1981) points out that based on the work of cognitive learning theorists such as Piaget and Bruner we can expect that "if students are intrinsically motivated to learn something, they may spend more time and effort learning, feel better about what they learn, and use it more in the future." (p. 335)

A strong theme of contemporary research in education is independent learning. Motivation, a cornerstone of all theories concerned with the effectiveness of learning, is found to be higher when the learner is the one controlling his own progress (O'Neill, 1987). The great advantage of present technologies, such as the interactive video, and those in development is that they provide for independence and for a dynamic involvement in learning rather than the passive reception of information which characterizes traditional classrooms. The media system in this study was represented by two technologies: one-way television and two-way interactive telephone (the student can converse with the source of transmission during a broadcast).

Achievement was examined by looking at two sources. First, we looked at the classroom grades of the students, recognizing they are only a limited, external measure. In addition, students were asked to provide a self-rating of academic achievement and level of motivation. Their perceptions of their own performance were an important subjective measure, and also allowed us to tap into the appeal factor of learning by satellite.

Experimental Manipulation in the Design

Six students were categorized according to one of two levels of motivation, high and low, by their responses to a questionnaire, and exposed to one of the three instructional programs, Spanish, marine biology, or astronomy. A low and high motivated student was selected for each of the three broadcasts. We followed two students during the Fall of 1989 and the Spring of 1990 watching Spanish, two students during the Fall of 1989 watching astronomy, and two students during the Spring of 1990 watching marine biology. The four science students were from the same school and the Spanish students were from a second school.

School grades and self-estimates of achievement were collected at the end of both semesters. Motivation and attitude information were collected for entire classes receiving programming using questionnaire data. Motivation was assessed three times - at the start and end of the first semesters, and at the end of the second semester.

Objectives of the Research

The major objectives were:

1. Demands made by changes in the environment, that is the introduction of new technology, will require a new set of behaviors for adaptive responding. Adapting means the change in well-established behavior when students are exposed to a novel learning environment requiring new strategies and routines for success. We

wished to identify adaptive behaviors and the variables leading to successful adaptation.

2. To add to theories dealing with the concept of adaptive behavior, learning, and technology, especially in defining adaptation to new technology.

3. To provide a descriptive account of how the social environment allows adaptive functions to operate successfully.

Method

Subjects

The subjects were selected from a population of high school juniors and seniors enrolled in the satellite learning courses being broadcast by the Texas TI-IN network (astronomy and marine biology) and the Midlands Consortium Star Schools Project through Kansas State University (Spanish). Any school or individual in the United States could buy these programs. The units of focus were the six individuals targeted.

In the first school we selected a male and a female based on their responses to the questionnaire. The female had a high score on the CTBS standardized ability test as compared to an average score for the male, however it was the female subject who was lower in motivation. In the second school, during the first semester, we selected two females. In this case a standardized test score was available only for one subject since the other was a new student. The high motivated student ranked in the top one-third of her class with a GPA of 3.0. Due to attrition, we had to select two new students for the Spring semester when marine biology was introduced; the high motivated student was in the 15 percentile and the low motivated student was in the 57 percentile on SRA standardized test of ability. It is important to us to have this mix of motivation and ability between the six students; Bates (1988) suggests that instructional television can be especially helpful to borderline students where borderline refers to poor performance as a result of both motivation and ability.

The classroom chosen in this study was not the traditional type one might expect. Enrollment in Spanish did not number more than nine students, carefully selected by their school for their average to superior performance in English; they represented the schools' initial exploration with satellite television. Enrollment in the astronomy numbered fifteen, the majority of whom had not had previous experience with televised classes; the two target students were included in the naive group. But in this case students could elect to take the course without regard to their school record; thus, the astronomy class had more variability and was closer to a typical class. When the broadcast changed to marine biology for the Spring of 1990, the class size dropped to nine. A second point is that all students enrolled for both programs during the target semester were included in some part of the study having indicted their willingness to participate by signing the consent form.

The total number of high school students nationwide expected to take the TI-IN courses was approximately 300 nationwide each while the University of Kansas MCSSP broadcast expected some 800 students to enroll. A possible limitation is the fact that, based on previous research, most students electing to take satellite languages are generally more motivated than one would expect from a random sample.

Instruments

Measures of attitudes to learning by satellite, to Spanish, marine biology, or astronomy, and level of motivation were collected using the Distance Learning Questionnaire (DLQ) and a diary called the Distance Learning Commentary Sheet. The students also participated in an open-ended interview at the end of the first and second semester. Grades distributed by the in-class teacher in conjunction with TI-IN or Kansas State University were used despite the variability of grading scales between schools. Observational data was collected by both time-sampling and event-sampling methods on a single observation form.

The Distance Learning Questionnaire (DLQ). The three variables - attitudes towards learning by satellite, level of academic motivation, and interest in the academic content - were measured by a 60-item questionnaire developed by the authors and called the Distance Learning Questionnaire (DLQ). The questions are presented in random order, each requiring a dichotomous response, but can be grouped into the three categories. The validity and the reliability of the questionnaire in a distance learning context was supported by other sources. After selecting subjects according to their responses to the questionnaire, the author interviewed classroom teachers and the school counselor in order to confirm his selection of the four target students. The school personnel showed strong agreement with the authors selection, based on their knowledge of the student and school records. A second means of finding supporting evidence was to compare grades earned in class to standardized achievement data. In this case, a number of students who indicated they were low in motivation on the questionnaire, and who also earned low grades, were found to be of sufficient ability according to their scores on the standardized tests. It was therefore assumed that their responses indicating low motivation were in fact a true reflection, and the probable reason for their poor performance. The opposite result held for those students who had low ability but went on to get high grades; the questionnaire indicated they were of high motivation.

The DLQ was subjected to principal axis factor analysis followed by varimax rotation. Initially 16 factors were identified for the 60 items with eigenvalues above 1.00, accounting for 94.6 % of the variance. However, the solution which provided the easiest interpretation was a three factor solution corresponding to the three subscales of the questionnaire and accounting for 43.6 % of the total variance. Factor I contained 75% of the subject subscale items, factor II had 60% of the television subscale items, and factor III had 73% of the motivation subscale items.

Reliability estimates were also calculated. The motivation subscale had a Cronbach alpha of .56, the subject subscale .86, and the television subscale .90. The Cronbach alpha for the entire set of 60 items was .90.

The longitudinal involvement with two schools receiving satellite television for the first time and the observational data provided an excellent social context in which to validate the questions as measures of the constructs. There is strong evidence for a high degree of validity in making inferences from the DLQ about the consequences of motivation and interest in satellite learning. The complete DLQ can be found in appendix A.

Procedure

The courses were broadcast over two semesters, the Fall of 1989 and the Spring of 1990. Students were contacted through the school superintendents and the principal when they returned to school in the Fall of 1989, and their consent obtained. The DLQ identifying attitudes was administered immediately prior to the first broadcast of the semester, and students were classified according to their level of motivation, and by one of the two broadcasts in which they are enrolled. The DLQ was given again at the end of the semester and was administered for a third time at the end of the Spring 1990 semester.

Observations were taken approximately every two to three weeks, and diaries eliciting students' candid and spontaneous reactions to the course were written five to six times a semester. The diaries are listed in appendix C. A reliability observer accompanied the author on most occasions and data is reported for each case description. The classroom facilitator was interviewed at the end of each semester using an open-ended question format.

Observation of Students. The behaviors of interest and the observation sheet to record these behaviors were decided upon and created by the authors because previous instruments and examples were rare. After a few informal observations of students learning from television in their normal classroom setting, it became clear what behaviors would be valuable to record during the semester.

Student attention was a priority for observation. Attention meant watching the television and responding when required either verbally, by reading the textbook, or writing. Attention also included involvement in technical requirements such as calling the television teacher on the telephone to ask a question or take part in a discussion.

The other area of importance was the television teachers and how they were presenting the material. The temptation is to lecture in an impersonal manner because there are no students in front of you. This turned out to be one of the key elements in successfully commanding student attention; if a television teacher appeared to be impersonal, students lost interest. If the television teacher behaved as if he were talking to each student as an individual and with concern, attention was much more likely.

For this reason, it was also important to track how often the teacher required a response from the student or encouraged discussion on the telephone when an individual called. Supporting materials such as music, film clips, simulations and diagrams were also counted since research indicates the importance of variation and context in maintaining interest (Hart, 1988). The observation sheet allows us to look at the spacing and duration of support materials during the lesson: regular network television is based on the three to five minute attention span of the viewer - after that you need to change what is on the screen or attention starts to want. The observation sheet and coding system is in appendix B.

We were not primarily interested in the behavior of the teacher facilitator whose major role appeared to be classroom manager. Such managerial skills are not employed differently either in a regular classroom setting or when students are learning by satellite. By the end of the first semester our experience in watching the students each week confirmed that the classroom teachers were differentially involved in teaching.

The upper line of the code block represents the record for the television teacher; the lower line is the record for the target students. The first column within each interval is the target student selected as highly motivated based on questionnaire data gathered at the start of the study, and the second column is the student with low motivation.

We observed the two students and the television teacher for thirty minutes during each lesson, divided into one minute intervals. At the 45 second mark, the observer looked first at the television teacher and then at the two target students and wrote the appropriate codes on the sheet.

Three other spaces were for data which we considered would create a more complete picture of what was taking place. First, questions asked by the two target students were recorded no matter when they occurred and a frequency count was made. Questions were categorized as positive (relevant to the class and what the television teacher was doing) or negative (no relevance).

Second, we recorded our own comments on what we saw taking place. For example, odd behavior and special circumstances which might explain an unusual pattern in the interval data turned out to be important. Finally, we made a note of the seating arrangements and the position of the television. This, too, turned out to be important in understanding the interval data. Appendix B contains a list of the codes used, and the definitions of the behaviors.

Data Analysis

Correlated t-tests of the difference scores were performed on the questionnaire data to look at differences within the two schools in attitudes and motivation and level of interest in the subject matter.

Mean scores for each of the six students and the prototype students were calculated. Visual inspection of the graphs indicate the time spent by each student on-task and the differences in height for each line. The second set of graphs break down the various behaviors observed and give percentages for each category for an entire semester. Mean level of motivation and range are reported for an entire class for a particular semester calculated from the diaries.

Case Study One

Questionnaire Data

The questionnaire data was primarily used to identify our two target students, one high in motivation, the other low. The school counselor and the teacher facilitating the class confirmed our choices from their experience with the students. An interesting point is that the student we selected as high in motivation had only average scores on the CTBS standardized ability test in the area of language skills such as mechanics and expression. In contrast, the low motivated student had high ability scores in language skills. Thus, subject one would need to be more motivated and pay greater attention to achieve the same level of performance as subject two.

The two sets of data for the entire class from the Fall, Christmas and Spring administration of the questionnaire did not reveal any significant results. That is, for each subject, we paired their total score on each of the three subscales from the Fall administration with the Christmas and with the Spring administration giving nine pairwise t-tests for the entire class data. Therefore, over two semesters there was no significant change in these students motivation for school in general, interest in the language they were learning, and attitude towards learning by television.

Observation Data

The observation data was striking for the two subjects. We also included as a method of control a line based on random, averaged observation of other students in the classroom which we called the prototype student. During the first semester, the high motivated student was on-task an average of 92% of the time, rising to 93% the second semester, yielding a total average of 92.5%. The low motivated student was also high during the first semester with an average of 83% time on-task. However, this dropped to 78% during the second semester yielding a total average of 80.5%. The rest of the class paralleled the low motivated student: total average over two semesters was 77.4% time on-task. Interobserver reliability tended to be 100% for the teacher behavior and 83% for student behavior.

Insert Figure 1 about here

An examination of the graph lines shows some interesting patterns: After a slow start, the high motivated student maintained a relatively straight line over the two semesters indicating consistency. The low motivated student had a zig-zag line showing great variability from month to month and becoming extreme in the second semester. The prototype line representing the average behavior of the rest of the class showed consistency during the first semester but also showed extremes of high and low during the second semester. The lines for the low motivated student and the rest of the class fell during the second semester.

The pattern of the high motivated individual makes sense when we consider the combination of motivation with average language ability; performance in this case depends on attention. The low motivated student, however, can afford to vary in the amount of attention paid to the program because of a stronger ability. It is noticeable that, during the first semester, the low motivated student spent some three times the amount of time occupied with themselves than the high motivated student, and this was the particular behavior rather than disrupting other students as a distraction. Both students spent the same amount of time paying visual attention but the high motivated student spoke more and did twice as much writing. During the second semester, the low motivated student showed a large decrease in the amount of time spent paying attention to the television and maintained the same amount of time occupied with themselves. But we still need to relate the patterns to the teaching of the television teacher.

Insert Figure 2 about here

The television teacher spent approximately one third of the time directly lecturing, and half the time giving instruction requiring a student response during both semesters. Naturally, we might expect some drop in attention levels during the second semester of the course but the data indicates two interesting possibilities.

Insert Figure 3 about here

First, the amount of time given to instructional support material such as photographs, diagrams, and short movies increased by almost half during the second semester. Second, the amount of time the television teacher spent interacting with our particular classroom on the phone dropped by more than three quarters during the second semester. The fact that student attention showed a drop-off and such variability, and that it may be related to instructional support material and direct contact with the class is supported by students' comments in the diary and interview sections of this paper.

<u>Diaries</u>

The students in this school showed a number of patterns in their comments. Overall, the vast majority spoke highly of the experience. The mean rating for motivation was 7.23 with a range of 6 on a scale of 1(very low) to 10, and a standard deviation of 1.31. There was only one rating of 4 and four ratings of 5 for the entire data set. These ratings are noteworthy since they are not what one would expect from a traditional classroom; that is, for an entire semester the class as a whole were between a medium and a high level of motivation for this course.

Frequent comments were made on the rapid pace of instruction. Students felt the program moved a little too fast and that if they missed a broadcast it required some effort to compensate. However, they qualified this observation by saying that the pace helped them stay interested, was a challenge, made learning difficult but fun, and that, at least, the teacher explained things clearly. Students were also motivated by the novelty of the situation.

An example of the importance of novelty is the use of the name of the school during the broadcast. The television teacher would show the school mascot or football shirt, or mention the name of the facilitator whom he had conversed with on an earlier occasion. This public recognition of the school made the students feel important. Using the phone was another novel situation differentiating the experience from a normal classroom and making it fun. But many of them were conscious of needing a fair and democratic use of the phone and the teachers time during a broadcast. Too much participation by a single school caused resentment. Thus, as the method of selecting incoming calls became more organized and the request for certain schools to call was made by presenting a list at the start of each program, students showed relief. It was evident that students came to recognize they were spokespersons for a new and emerging approach to learning.

In regard to the teacher and the content, the students' comments were consistently positive. They liked the personality of the teacher, his instructional style, and found him challenging. They were also kept interested by instructional support material such as visiting Spanish guests, short films on Spain and Spanish culture, and other novel means of presentation such as playing games.

One question on the diary asked if any events related to learning the language took place outside of class. Many students gave examples such as speaking Spanish with their friends, demonstrating their speaking ability to their family, reading a Spanish book, and even writing to a Spanish friend. We believe their willingness to experiment with the Spanish language in a larger context than the classroom was due to their high level of motivation. This high motivation can in turn be traced back to two important features of the broadcast: First, the expertise and enthusiasm of the teacher and the fast pace with which he drew them along, and second, the embedding of the language in its applied context, that is, Spain and the Spanish people, through the use of film clips and native speakers.

Course Grades and Interviews

Course grades need to be refereed to in the context of both teacher and students' comments. The reason is that grades were assigned by the classroom teacher and cannot be generalized as a measure of student performance outside the context of this particular classroom. However, they are valuable for comparisons within the classroom and as a supplement to the important question we posed to students as our measure of learning: Do you think you learned more in this class than in a normal one?

In terms of frequency of grades assigned, over two quarters there were two A's, eight A-'s, four B+'s, three B's, and one B-, making an A- the mode. Our target student's each received the same grade, an A-, and a G.P.A. of approximately 3.6. However, over the two quarters, the high motivated student dropped from a G.P.A. of 3.8 to 3.32 while the low motivated student increased from 3.56 to 3.68. Just as in a normal classroom, we might wonder if sustained attention becomes taxing over a long period of time, and if those who are low in motivation can increase their performance at will to maintain a G.P.A.? If this is the case, the distance learning classroom is no different in facilitating such behavior as the traditional classroom. Classroom grades proved to be an unreliable measure of learning and no further information was gathered during the second semester.

Student Interviews. Student reactions to the experience were unanimous. The class was more fun than a traditional one and this contributed in a major way to their motivation. They also said they did better grade-wise, and although the tests were sometimes easier than other classes, this was compensated by the fast pace and the large volume of subject matter. They gave high praise to the television teacher noting that he was humorous, spoke and behaved at their level, and most importantly, taught as if he were speaking directly to each student as an individual. This is interesting since the television teacher cannot see any students, the students must suspend their perception of reality in order to experience the teacher as personally communicating with them. On the other hand, the television teacher is always looking directly at each individual whereas a normal classroom teacher continually shifts attention from one student to another. They also spoke of the importance of instructional support material: short movies, information about the

Spanish people and the social, geographical, and historical context of the language, greatly increased their interest and motivation. The students were clear that it helped them learn.

Laboratory time when the program went off the air and students engaged in some exercise was an important adjunct to watching the television. Sometimes the teacher, in being true to the nature of a language, spoke fast and used unfamiliar words which frustrated them; labs and other systematic breaks allow students to focus and ask questions. Time on the phone was important to the students, not for learning but rather as a motivator. They felt it was an injustice when another school received more attention. In the true spirit of behavioral theories, public recognition of a group or individual is a powerful reinforcer.

The final point, and one of singular importance is that the classroom facilitator must have an understanding of the material. Facilitators are not classroom managers; they teach in conjunction with the television teacher, answering questions, providing guidance, motivating, and expanding material. They also individualize the material for the needs of particular students of whom they have an intimate knowledge unavailable to the television teacher.

Facilitator Interview. In regard to motivation, the classroom facilitator felt that although students were interested in the experience, it took a while for them to realize that television was not a source of passive entertainment but rather an active learning task. The major help for encouraging students was that they were being exposed to an expert in the language which is a resource not always available. There were some disadvantages, however.

Students were weak in their writing and speaking skills, more than one would expect in a traditional classroom. This is not surprising since the opportunity to speak was infrequent, and it is difficult to have students do much writing while the program is being aired. The other major disadvantage, and related to a students acquisition of skills, is that the classroom facilitator does not have much control over the lesson plan and this can be a frustration.

The teacher in this case, an experienced, able, and popular teacher who has taught another foreign language, believed the students would have learned more in an ordinary classroom, and that the role of the television should be as an instructional aid. Suggested improvements were twofold: first, more interaction between students, and with the television teacher on the phone; second, more writing and speaking assignments for a language class.

Case Study Two

Questionnaire Data

The questionnaire data allowed us to identify two students, one high in motivation and one low, our choices being confirmed by the school counselor and the teacher. The high motivated student had a high-average ability, ranking in the top one-third of her class with a GPA of 3.0 and a QUO of 104 on the SRA standardized achievement test. There was no standardized test scores or GPA available for the low motivated student since she was new to the school. Due to attrition we selected two new target students for the Spring semester, the high motivated student with a QUO of 107, and the low motivated student with a QUO of 136 on the SRA standardized test.

Questionnaire Data

The two sets of data for the entire class from the Fall, Christmas and Spring administration of the questionnaire revealed some significant results. That is, for each subject, we paired their total score on each of the three subscales from the Fall administration with the Christmas and with the Spring administration giving nine pairwise t-tests for the entire class data. On the motivation subscale there was no change over the Fall semester but between Fall and Spring there was a significant drop (p. < .001) and between Christmas and Spring (p. < .001). Interest in the subject they were studying was even more dramatic; there was a loss of interest over the first semester (p. < .001), from Fall to Spring (p. < .001) and from Christmas to Spring (p. < .001). The least change occurred in their attitude towards learning by television although all pairwise comparisons showed a significant drop. From Fall to Christmas interest dropped (p. < .01), from Fall to Spring (p. < .001) and from Christmas to Spring (p. <. 001).

Observation Data

There are two strong features to the graph lines for both students and the control line which is a mean of a number of random observations called the prototype. First, the percent of time on-task is very low, and second, there is a great deal of variability in behavior from week to week. The high motivated student was on-task an average of 28% of the the time during the first semester, while the low motivated student was a mere 15%. However, the average class performance was quite superior to these two with an average of 53% time on-task. The implication may be that motivation and ability was not a contributing factor in a student's attention to the program. Interobserver reliability for teacher behavior was usually around 100% and averaged 83% for student behavior.

Insert Figure 4 about here

The two target students from Fall of 1989 did not enroll in the Spring for the new course in marine biology, and the size of the class dropped by some 50%. Thus, we had to select two new students still based on questionnaire responses and dichotimized as high and low in motivation. In this case the high motivated student had an on-task average of 15.5% and the low motivated student one of 21%. The class average dropped to 16.6%. Thus, the on-task behavior of the class in general showed a severe drop with the two target students varying little around this mean.

All observations show that behavior tended to vary a great deal from week to week but that the variation was usually consistent for all subjects within a particular week. Interestingly, the high motivated student started out with a great deal of attention and the low motivated student showed almost no attention. But a certain synchronicity developed whereby the average class behavior was a mirror of the individual behavior of our target students. This again supports the point that motivation to learn and ability were not powerful enough to differentiate between the behavior of various subjects.

Making a fine-grained analyses of the categories of behavior which define on-task and off-task, we find that both the high and low motivated students spent almost the identical amount of time off-task in one particular category: they were off-task with other students such as talking or making jokes. The low motivated student was off-task twice as much time in the category of preoccupation with themselves. The same data was evidenced during the second semester with the two new students: up to 70% of their time was spent off-task with another student. The most positive result was that visual attention increased markedly almost doubling the class average over the first semester; this increase was counterbalanced by the concomitant increase in off-task behavior with other students. The decrease in class size appears to be an important point in this regard.

Insert Figure 5 about here

Looking at the television teachers behavior we can identify a major change which did not help attention although it would be expected. Interactive lecturing increased threefold in the second semester. There was also some technical problems in the studio on the days we observed which ironically may account for increased attention due to the novelty of the situation. But actual interaction by phone with the classroom was nonexistent and should therefore not be counted as an influence on behavior.

Insert Figure 6 about here

Diaries

The majority of comments made by these students tended to be negative. An examination of their motivation ratings is highly indicative of their interest: For the Fall semester, the average rating for the fifteen students was 4.25 with a range of 7 on a scale of 1(very low) to 10, and a standard deviation of 1.88. There was a single highest rating of 8 and three ratings of 1 for the entire data set. Thus, for the class remained at a low level of motivation for the duration of the class. This fell in the second semester to a mean of 3.29 and a standard deviation of 2.50 with the introduction of new content but the same television teacher.

The major positive comments were made about the laboratory sessions. During this time the television teacher would go off-the-air while the students worked on an assignment, or she would return to answer questions and provide guidance. The students indicated that long periods of concentration on the television without the opportunity to do some hands-on activities were taxing. In the case of the astronomy class, the content allowed for some interesting activities such as the construction of astronomical observation and measurement devices, and required a cooperative effort involving small groups.

However, the outstanding impression one gets from reading the student diaries is that they were bored, the word recurring with great frequency. It is important to understand the implication of the word 'bored': the students were not having trouble with learning or motivation due to the classroom environment, distractions, the classroom facilitator, or the content; being bored came down to what was taking place on the screen. All indications are that the students were not interested, and not learning, because of the television teacher. The students felt that the television teacher was first, patronizing, and second, not very knowledgeable in her subject matter.

The impression the television teacher made was that she was teaching young children rather than high school young adults. In fact, she suggested the use of reinforcement for performance using a token system inappropriate for the age level she was teaching. This attitude was evident during phone calls when she tended to waste time in explanations of subject matter with the caller. Yet it is an anomaly that while having a manner more appropriate to a younger class, these students consistently commented on how fast she moved through material. One complaint was that they could never take complete notes since they did not remain on the screen long enough.

There was also the problem of the television teachers knowledge of her subject. Although we might question whether or not she was very knowledgeable and that the problem was actually one of being able to communicate and teach effectively, the students believed the teacher was not expert. They formed this impression because of a lack of fluidness in her talking, marked by frequent pauses and restatements, and poor answers to students calling on the phone. The slow, monotone voice of the teacher was also a major contributing factor.

The diaries were particularly noteworthy for their omissions. No comments were made on the fact that the program was live and interactive, or about their participation in a novel classroom with advanced technology. Neither did they relate anything they were learning in the classroom with the broader context of their lives such as watching astronomy programs at home, using a telescope to view the sky at night, or even reading newspaper and magazine articles. The diaries indicate that the low motivation of the students for the program extended to their willingness to critique the whole experience of learning by satellite or to attempt other strategies for efficient learning.

Course Grades and Interviews

Course grades only make sense in the context of the particular classroom and should only be used to make comparisons among students within that classroom and not across schools. We supplemented the assigned course grades with the students' own ratings of their performance as a measure of learning. In terms of frequency of grades assigned at the end of the first semester there were three B's, three B-'s, one C+, six C's, one C-, and one D, making C the mode. Our target student's each received the same grade, a C. However, the low motivated student showed a decline from the first to the second nine week grade, while the high motivated student improved. Thus, the satellite classroom parallels the traditional one in that those who are motivated can improve their performance when it matters to them.

Student Interviews. The main comment made by students was a complaint about the television teacher. For example they felt she did not know the subject, did not give satisfactory answers to questions, treated them like elementary school students, and did not follow the book. It is noticeable that these elements of teaching are not in any way unique to distance learning and could easily be rectified. But they also mentioned that class materials did not arrive in the mail on time which may become a problem with the particular distance of the site or the skill with which the program is organized by the broadcasters. The dislike for the teacher carried into the Spring semester. The students said that though the content, marine biology, appeared interesting, they were prejudiced by their earlier experience. For example, most students said they would take another course by television as long as it was a different teacher presenting.

The interactive aspect of the program was not a motivating factor. On the rare occasion when they succeeded in having their call answered, the answers to their questions were not satisfactory. They did enjoy some of the laboratory activities when they could work in cooperative group situations and not pay attention to the television. Most importantly, they were unanimous in saying that their performance in this class was below that of which they were capable and which they evidence in the traditional classroom.

Facilitator Interview. One of the main advantages for the classroom facilitator is that there is not the same amount of preparation required as for a normal classroom. However, there is more work than an unexperienced facilitator might be led to expect, and there are roles and adjustments required for which a teacher might not be prepared. For example, a major down side is that there is not the same degree of control possible. The facilitator does not have the authority and influence over students and therefore he must adjust his style and learn to interact in a different way. This lack of control extended to the administration of exams which were late arriving in the mail and involved too long a turnabout time in receiving grades.

The facilitator in this classroom believed that students started out motivated and interested but that the television teacher failed to keep their attention. It was essentially a question of the students having respect for the television teacher and buying into the program. This television teacher did not sound like she was very knowledgeable in the subject, showed little variety, and set up poor and unclear expectations. The facilitator believed that the grades did not reflect the ability of his students and that the tests were too hard when one considered the teacher's style and the program content: the learning which did result was mostly due to the students working on their own at home

It appears that the television teacher is the key to motivation and performance. Lack of discipline in the classroom is greatly affected by loss of interest on the part of the student, and also by the seating arrangements. It is preferable to have all the students facing the television rather than each other, and not to allow friends or cliches to be in close proximity. The reason is that the television is immobile, requires prolonged attention both visually and auditorally, and the facilitator does not have the same control and opportunity to enforce consequences as are available in the traditional classroom setting.

Conclusion

From our experiences with two rural Kansan schools during the academic year 1989-1990 we believe that learning by satellite can be as effective as the traditional classroom in terms of student performance and attitude, and sometimes preferable if a number of simple but essential steps are taken in preparation. These are 1) defining the role and responsibilities of the facilitator, 2) organizing the classroom, and 3) choosing a program not simply on its content but with due regard to the teacher and the instructional support material which will be used.

A balance must be achieved between the television teacher and the facilitator in the classroom. A monopoly by either one in terms of content, student interaction, or, most importantly, in the assignment of exercises and grades will result in a dysfunctional and unproductive class. This is a class with frequent disruptions and little learning. The only essential difference between the two teachers is that the classroom facilitator can respond to individual needs; needs include discipline measures as well as work assignments and pacing of material. The designers of instructional television need to make provisions for this in programming.

It is also clear that the classroom facilitator must support the use of technology in the classroom and regard it as an ally in the service of students. Any other attitude from disinterest to disdain is guaranteed to result in poor learning. This is probably applicable to all students in a given classroom since we have observed how even the most able and motivated students tend to perform in harmony with the standard adopted by the class as a whole when there is disruption.

The organization of the classroom should follow two simple rules: first, enrollment should not exceed some ten students. Physical proximity to the medium is essential; the television teacher cannot roam the classroom. And ten students or less means that an interruption affects everyone and therefore is less likely to be initiated by a given student. Second, seating should be in standard uniform rows with all students facing the same way. The television should be at eye-level and have no surrounding distractions. The facilitator needs to sit at such an angle as to see both the television and the students.

Finally, we cannot overemphasize the importance of knowing what you are buying. While it may be difficult to obtain information on the program and the television teacher, every effort needs to be made to contact schools who may have received the broadcast previously and to research the credentials of the broadcasters. Sample tapes should be requested. Students should be asked for their reaction to the new teacher. The television teacher should be interviewed over the phone by school personnel including the facilitator for their attitudes, experience, and teaching philosophy. It also behooves the school to contact the source of broadcast as soon as they detect problems with the instructional design or the television teacher and recommend remediation.

Instructional technology, especially the introduction of satellite television into the classroom opens up the student to a wealth of opportunity. It puts the school in contact with expert teachers and expensive instructional support materials otherwise unavailable thus providing equality in education. Instructional television can be used to free students and teachers from excessive time and labor in learning if it is used in a sensible and judicious manner.

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Figure Caption

Figure 1. Percent time on-task for case study one over two semesters.

Figure 2. Behavior profile for television teacher and target students for case study one during the Fall of 1989.

Figure 3. Behavior profile for television teacher and target students for case study two during the Spring of 1990.

Figure 4. Percent time on-task for case study two over two semesters.

Figure 5. Behavior profile for television teacher and target students for case study two during the Fall of 1989.

Figure 6. Behavior profile for television teacher and target students for case study two during the Spring of 1990.

Case Study: School #1

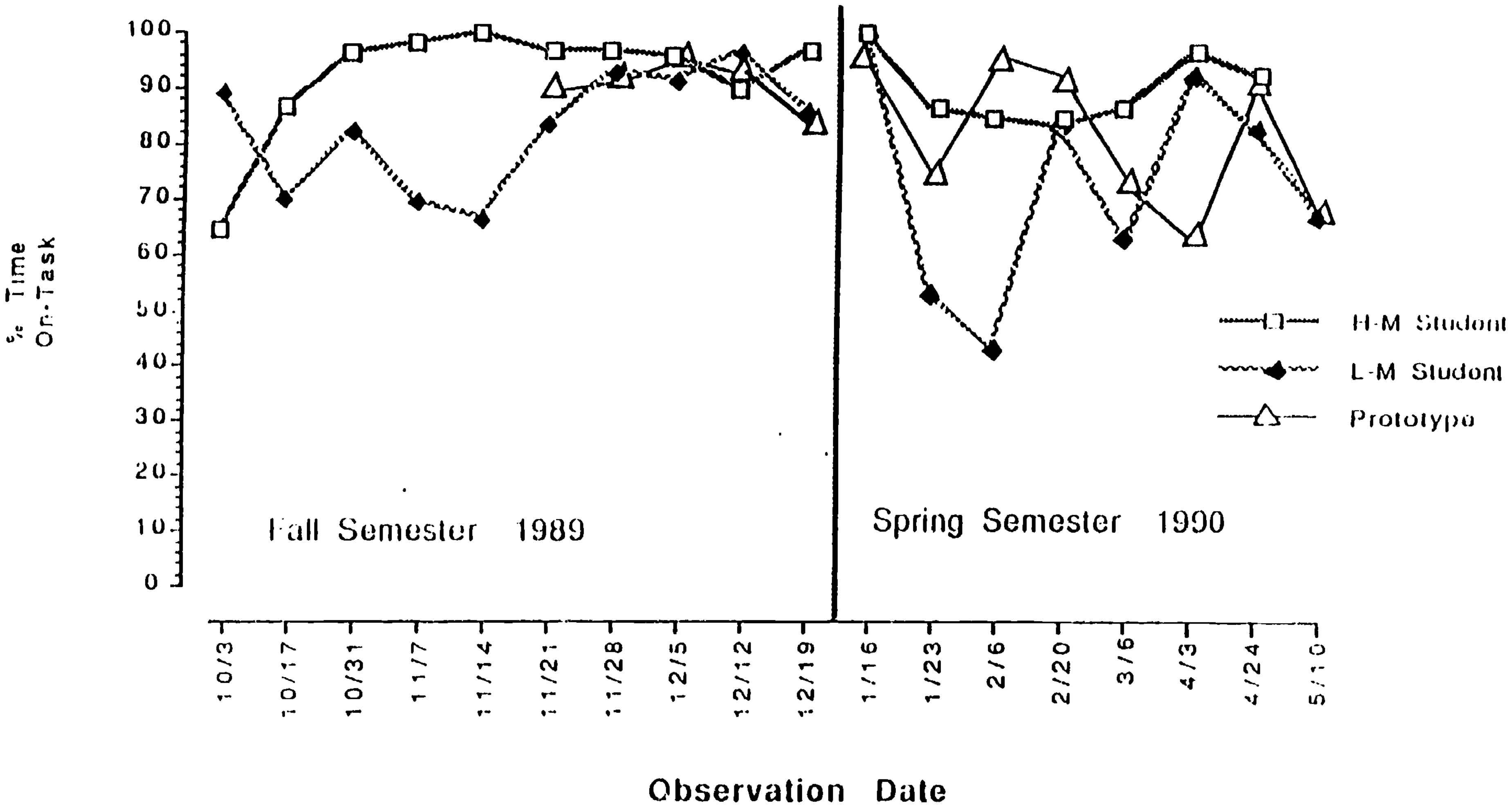
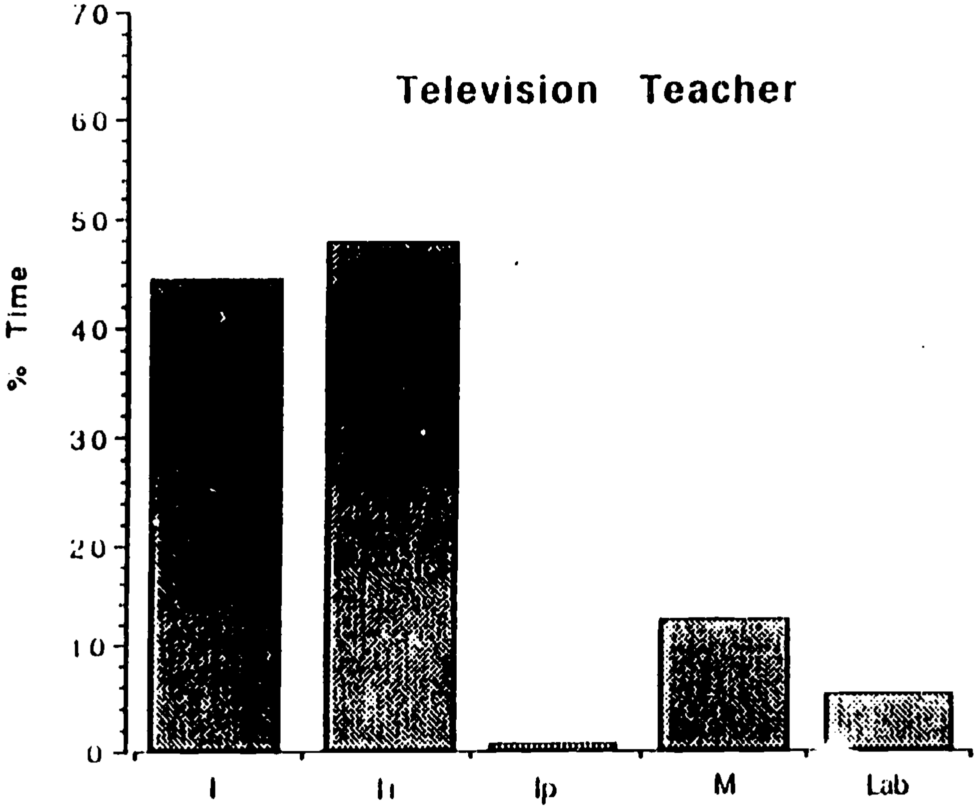


Figure 3.

Case Study : School #1

Spring Semester 1990



I : Direct Instruction

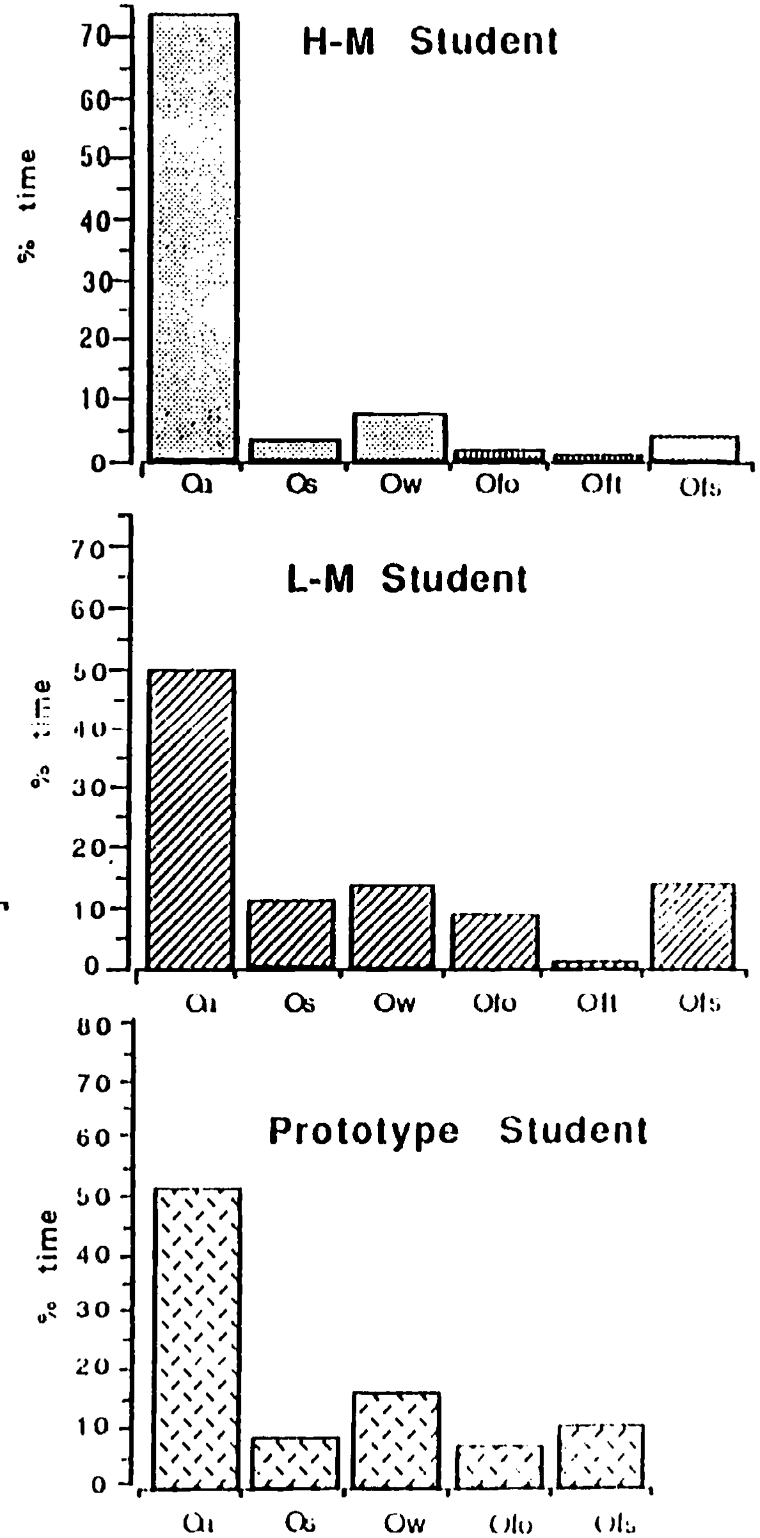
II : Interactive Instruction

Ip : Interacting with class on phone

M : Instructional Support

Ts : Technical difficulties in the studio

Lab : Off-air to allow class work on assignment



Oa : On-Task (Visual Attention)

Os : On-Task (Speaking)

Ow: On-Task (Writing)

Tt: Student involved in Technical Delay

Ofo : Off-Task with another student

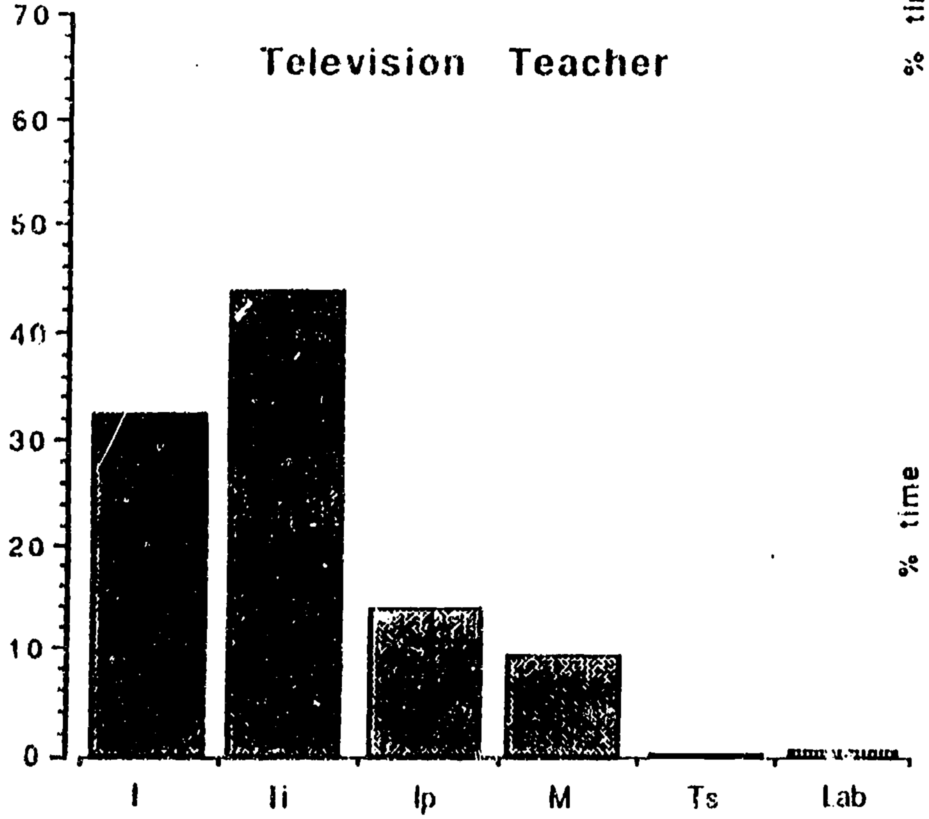
Oft : Off-Task with the teacher

Ofs : Off-Task with self

Case Study: School #1

Fall Semester 1989

Figure 2.



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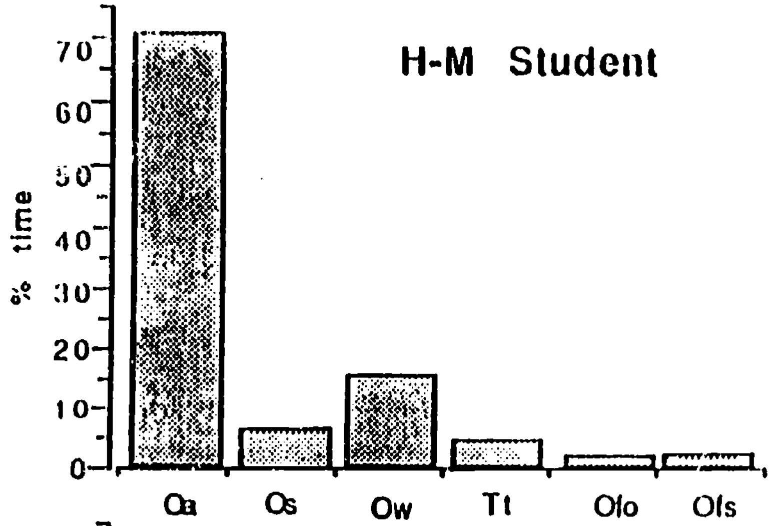
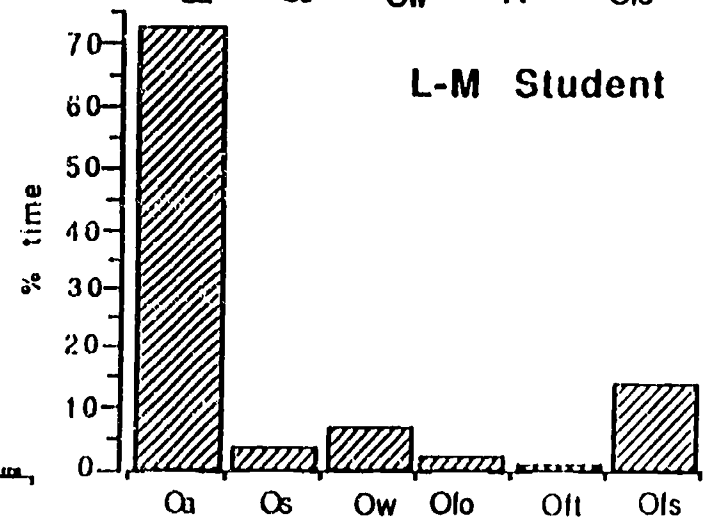
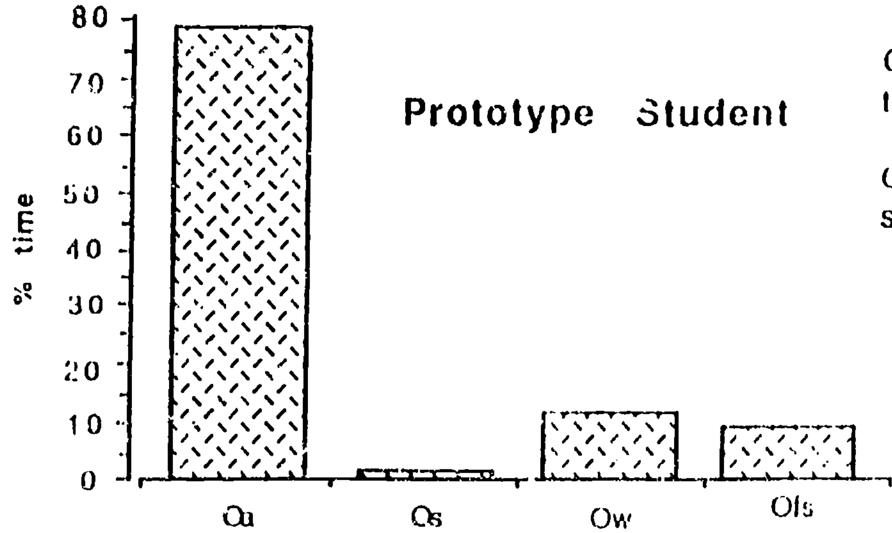






Oa : On-Task (Visual Attent.

Os : On-Task (Speaking)

Ow: On-Task (Writing)

Tt: Student Involved In Technical Dela

Ofo : Off-Task another student

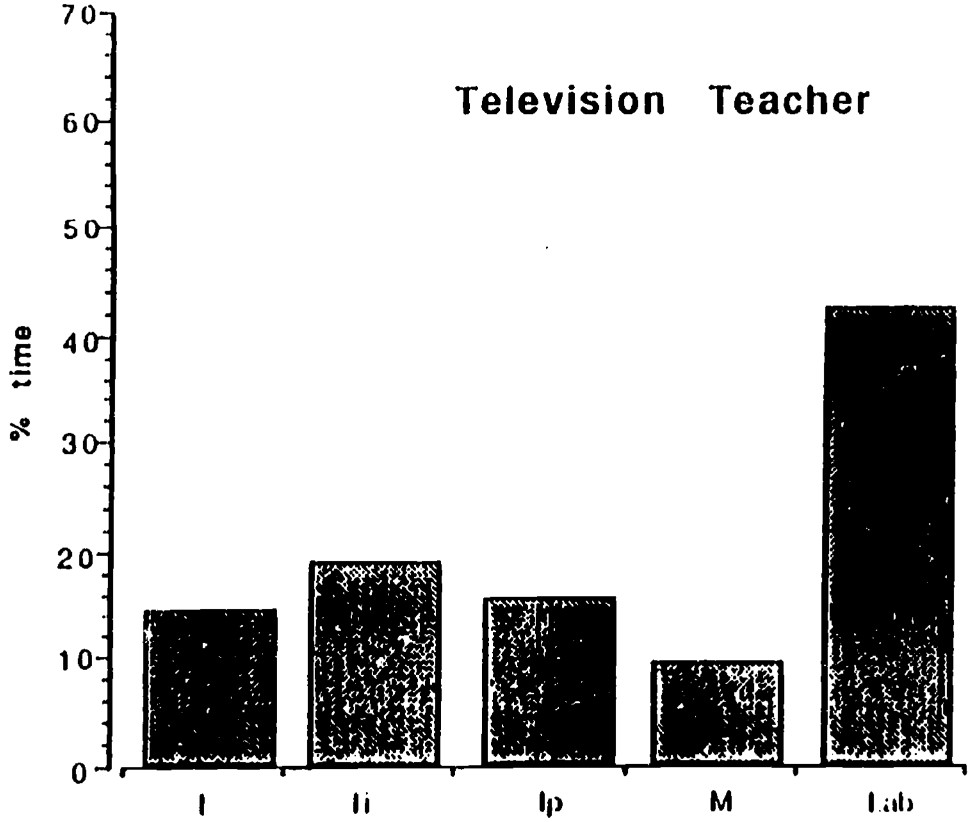
Oft : Off-Task the teacher

Ofs : Off Task self

Case Study: School #2

Figure 5.

Fall Semester 1989



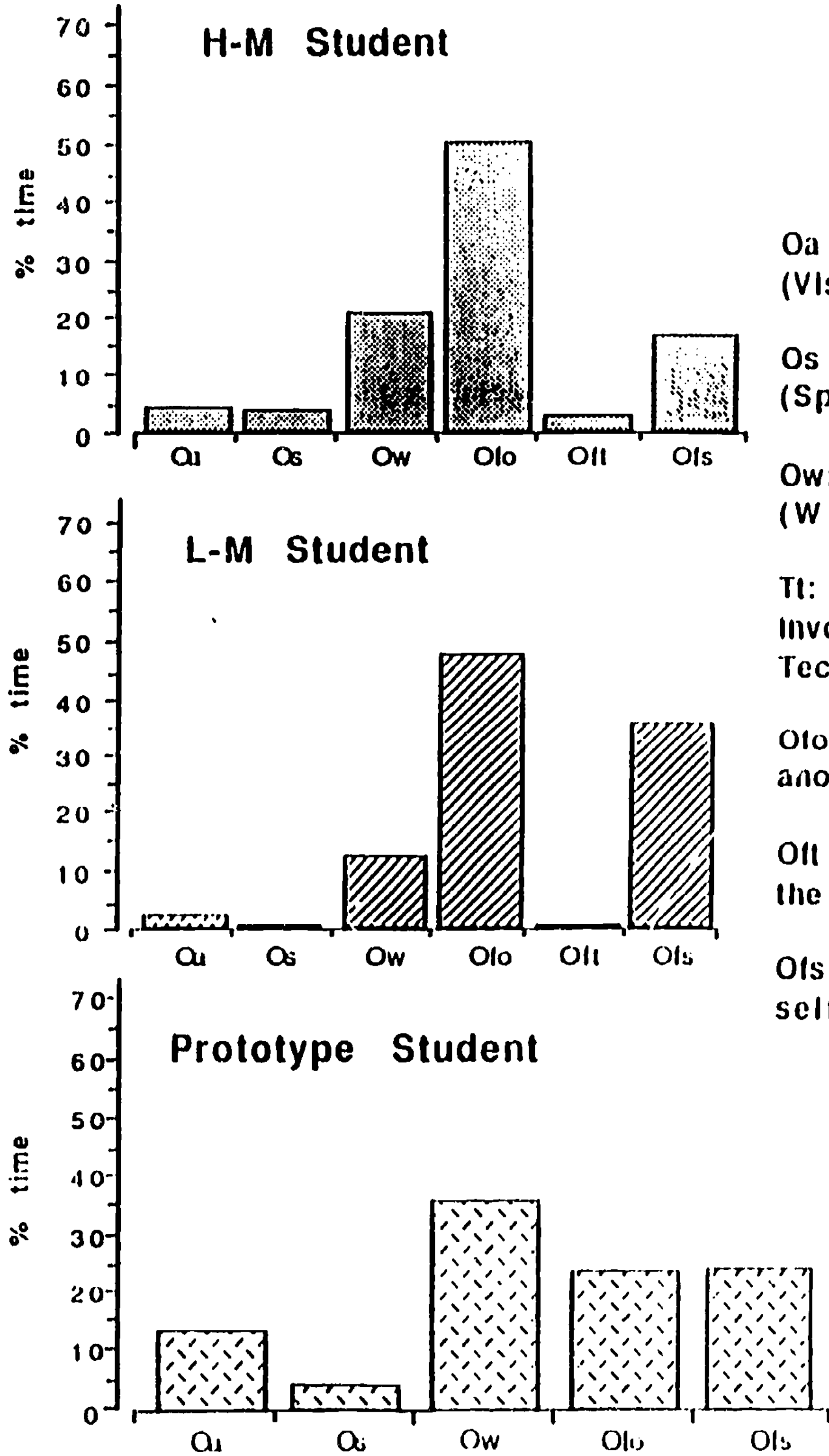
I : Direct Instruction

II : Interactive Instruction

Ip : Interacting with class on phone

M : Instructional Support

Lab : Off-air to allow class work on assignment



Oa : On-Task (Visual Attention

Os : On-Task (Speaking)

Ow: On-Task (Writing)

Tt: Student involved in Technical Delay

Oto : Off-Task with another student

Ott : Off-Task wit the teacher

Ots : Off-Task with self

Figure 4.

Case Study: School #2

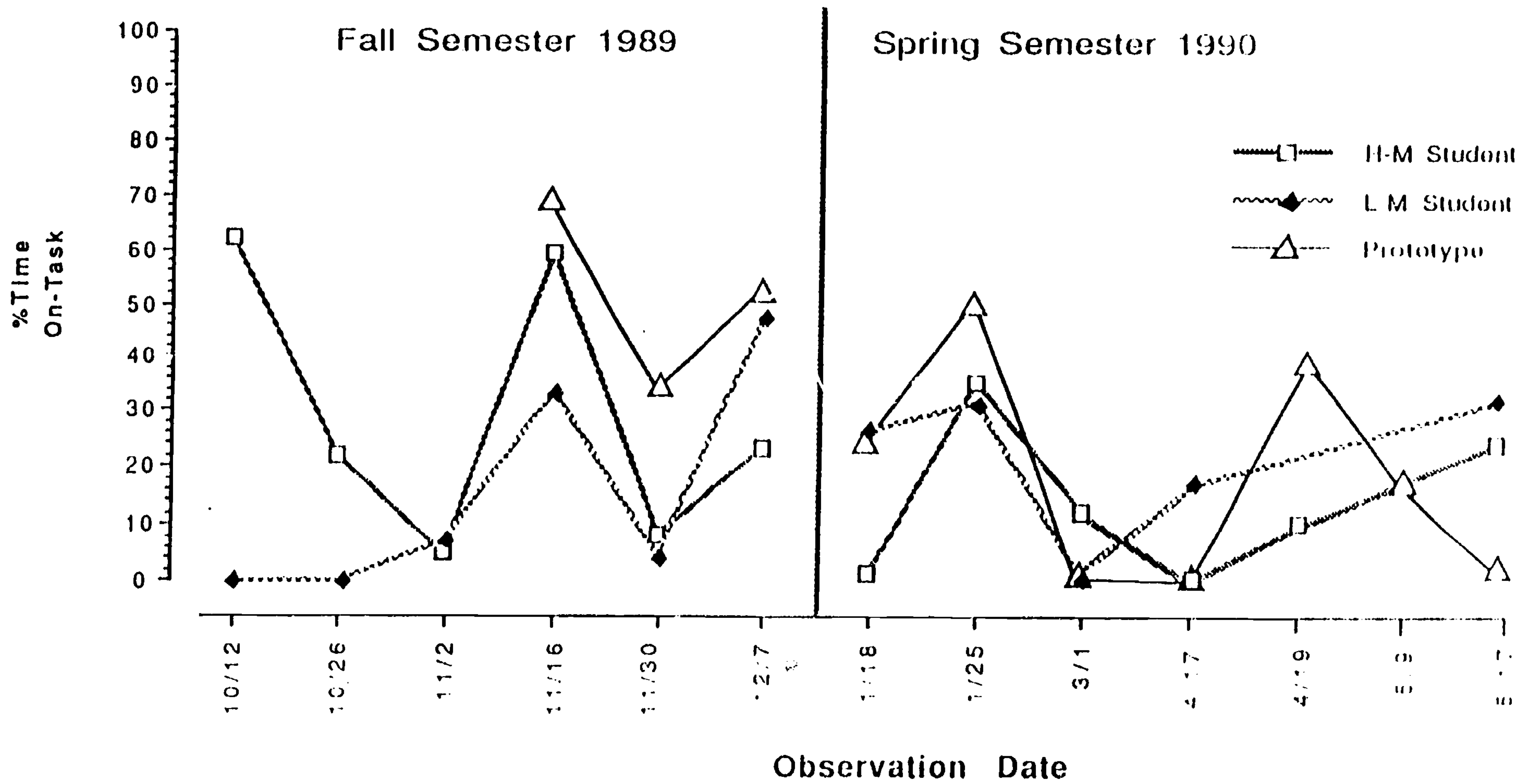
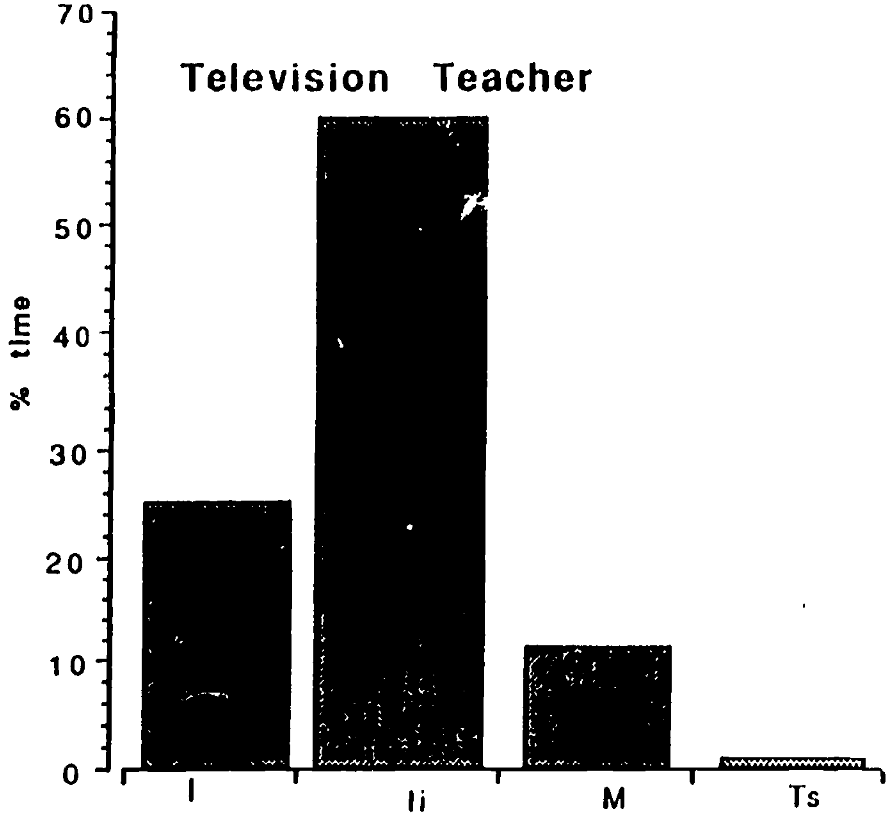


Figure 6.

Case Study: School #2

Spring semester 1990

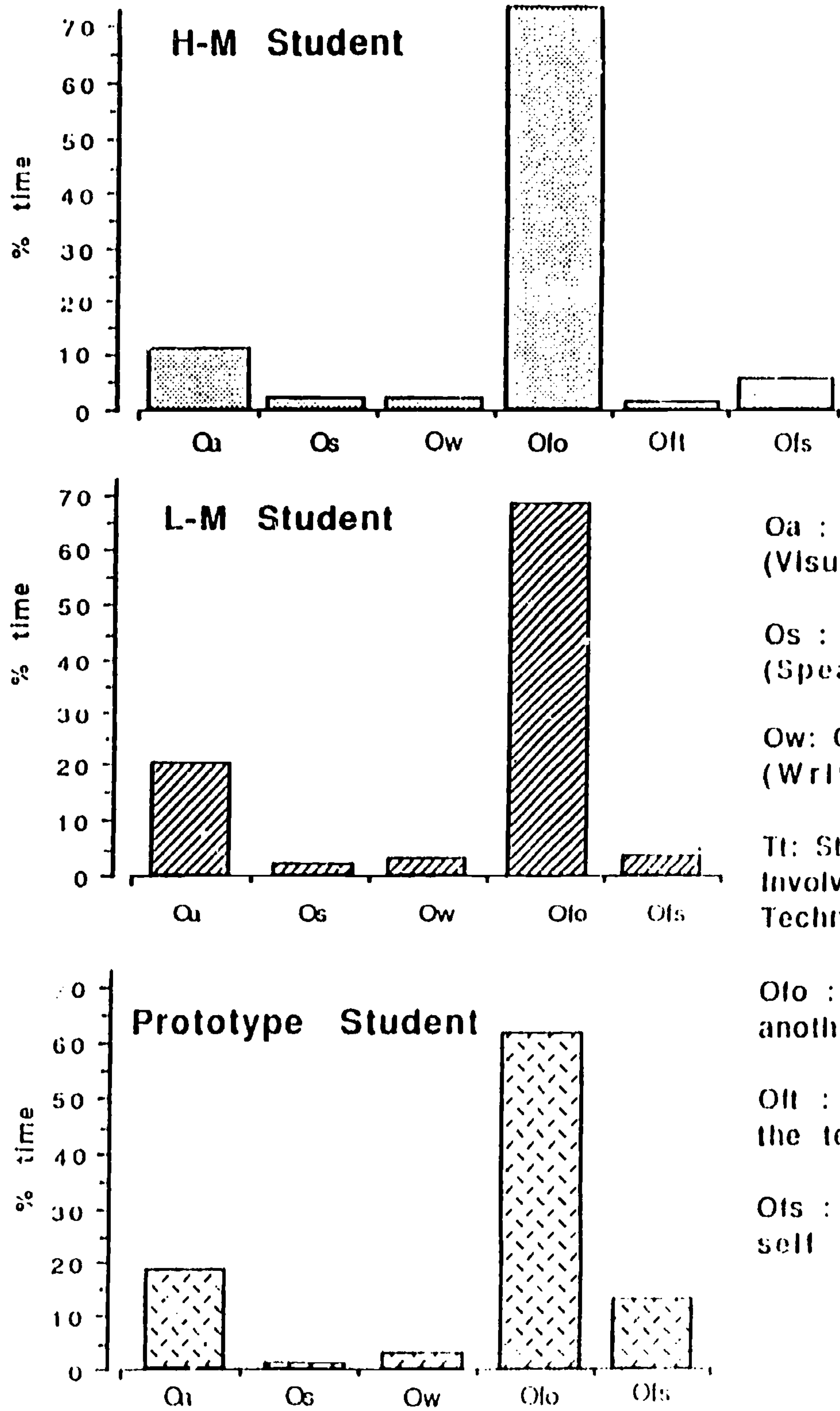


I : Direct Instruction

II : Interactive Instruction

M : Instructional Support

Ts : Technical difficulties in the studio



Oa : On-Task (Visual Attenti

Os : On-Task (Speaking)

Ow: On-Task (Writing)

Tt: Student Involved in Technical Delay

Olo : Off-Task w another student

Olt : Off-Task w the teacher

Ols : Off-Task w self

Appendix A

Distance Learning Survey

Name: ____.

Date: ____.

School: ____.

Place a circle around the response you wish to make:

1.	Do you like to answer questions during class?	YES	NO
2.	Do you feel everybody should know some astronomy?	YES	NO
3.	Do you enjoy most of what you are studying in class?	YES	NO
4.	Would you rather be doing something completely different from what you presently do in school?	YES	NO
5.	Is it O.K. with you when you sometimes receive a lower grade than you were expecting?	YES	NO
6.	Do you to like to watch educational television in school?	YES	NO
7.	Is performing well in school a fairly high priority in your life?	YES	NO
8.	Do you think astronomy is boring and not very interesting to learn?	YES	NO
9.	Does learning from television improve your performance at school?	YES	NO

10. If the same type of programs you had watched in school came on the television while you were at home would you probably switch to something else? YES NO

11. Do you do most of the things the television teacher tells you to? YES NO

12. Do you find yourself thinking of the television teacher as if he/she were someone you could relate to? YES NO

13. Can you see an important or useful place for astronomy in your future? YES NO

14. Do you enjoy looking for the answer to a question you are not sure of, or, is solving problems in school work assignments something you like to do? YES NO

15. Do you think it's great to be learning astronomy? YES NO

16. Would you say that the television teacher is as good as a live teacher in the classroom? YES NO

17. Do you make a point of following up, outside of school, what you have learned in your astronomy lessons ? YES NO

18. Do you like to have the same teacher appearing on the television each week? YES NO

19. Do your parents often encourage you to go on to a college or university after you have finished high school? YES NO

20. Are you not worried when you are suddenly faced with an unexpected quiz based on homework you were supposed to have done? YES NO

21. Could any of your friends say that you are a person who is enthusiastic about school and considers school work a central part of life? YES NO

22. Do you look forward to the day when you leave school and move on to something different? YES NO

23. Are you aiming to expert at astronomy? YES NO

24. Do your teachers think of you as not being very interested in most your subjects? YES NO

25. Do you really like the way lessons are presented on the television? YES NO

26. Do you get anxious and work harder when your performance in school shows signs of getting worse YES NO

27. Can you think of a few other things you would like to do other than what you do in school? YES NO

28. Is your astronomy class enjoyable? YES NO

29. Do you believe that satellite television is a great new opportunity for you to learn? YES NO

30. Is there a lot of enthusiasm about learning from television among your friends? YES NO

31. Are you disappointed when you miss an astronomy class? YES NO

32. When a classroom television program is over do you feel that you have really learned something? YES NO

33. Do you think the astronomy class is too long? YES NO

34. Do you believe a big problem about school is keeping interested and paying attention to what is going on in class? YES NO

35. Is it hard for you to get around to doing your astronomy homework? YES NO

36. Do you think that learning from a television needs more effort than learning in the "usual way" from a classroom teacher? YES NO

37. If you could, would you take more classes by satellite than you are now taking from a classroom teacher? YES NO

38. Do you think there are things which seem easier to learn by television than in the normal classroom? YES NO

39. Would you like to have a little more challenging astronomy lessons once in a while? YES NO

40. Do you hope your school will bring in regular classroom teachers in the future instead of getting the lessons by television? YES NO

41. Would you take something instead of astronomy if it was available? YES NO

42. Do you usually put in a "good effort" with your homework? YES NO

43. When you do badly in school do you get discouraged from trying again? YES NO

44. Would you like to take a course in which nobody would test how well you had learned the subject? YES NO

45. Do you care about other peoples grades and the standard of their work in school? YES NO

46. Would you be happy to spend a free hour working on some aspect of astronomy? YES NO

47. Do you think you are becoming more interested in astronomy? YES NO

48. Have the classes you have taken by satellite television turned out to be disappointing? YES NO

49. Do you take most of your school work seriously? YES NO

50. Do you mind if astronomy sometimes takes a little more effort than other school subjects? YES NO

51. Do you wish the satellite television programs were shorter? YES NO

52. Do you find it difficult to keep interested in astronomy? YES NO

53. Would you take a class some other way than through television if you could? YES NO

54. Do you find that taking a class by satellite television is dull? YES NO

55. Do you feel relieved if for some reason you have to miss a astronomy class? YES NO

56. Do you find yourself looking forward to class by television a little more than the "normal type" of class? YES NO

57. Is astronomy low down on your list of favorite subjects in school? YES NO

58. Do you like the fact that homework lets you know how much you have really learned? YES NO

59. Will you try to take astronomy at an advanced level later on? YES NO

60. Is most of what you are learning in astronomy an enjoyment for you? YES NO

Appendix B

Behavior Definitions and Codes to Accompany the Observation Sheet

Behavior of the Television Teacher

I	Teacher gives direct instruction to students without requiring a response. For example, direct lecturing.
Ia	An aide to the television provides direct instruction to students without requiring a response.
Ii	Teacher engages in interactive instruction requiring a response either verbally or in writing from the student audience. This includes times when the teacher is talking to a student on the telephone and is seeking a response from that individual but requires all those attending to make the response also.
Ip	Teacher is interacting with the class on the telephone.
M	A movie, film clip, short acted-out scene, or music is being played on the television as instructional support material.
T	Technical problems are being experienced either in the studio or in the classroom. A subscript s means the difficulties are happening in the studio, and a subscript c means the difficulties are happening in the classroom.

Lab	Television teacher is off the air and it is laboratory time.

Behavior of the Target Student

Ont	Student is on-task, following the instructions of the television teacher.
Os	Student is on-task, and speaking. Speaking includes repetition of what the television has said, speaking to peers, and speaking to the classroom facilitator, as long as the subject matter is relevant.
Ow	Student is on-task, writing.
Oa	Student is on-task, and paying visual attention.
Tt	Student is involved in some aspect of technical delay or difficulty. The primary example is the student waiting for the phone to be answered, although they may not necessarily be paying attention to what is happening on the television at the same time.
Of	Student is off-task
Ofo	Student is off-task, involved with another student
Oft	Student is off-task, involved with the teacher
Ofs	Student is off-task, involved with self such as staring into space, playing with pen, or reading another book.

Questions

A negative check means the student asked an irrelevant question.

A positive check means the student asked a relevant question.

Appendix C

Distance Learning Commentary Sheet

Name: ______________________________

Date: ______________________________

School: ______________________________

1. Some things I noticed about this weeks' program were...

2. The best aspect of this weeks' program was...

3. The poorest aspect of this weeks program was...

4. Related events which took place outside of class time were...

5. I would describe my motivation level in this course at the moment as...

high　　　　　　medium　　　　　　low

10..........9..........8..........7..........6..........5..........4..........3..........2..........1

Appendix D

Distance Learning Teacher Interview Questions:

1. Did you enjoy teaching this course using satellite television? Why?
2. What differences did you notice between this and a traditional course? Specifically, what differences did you notice in the behavior of students?
3. Would you recommend that students be exposed to more courses by satellite television? Which courses would work best?
4. What are the most positive aspects of a course given through the medium of television?
5. What are the most negative aspects of a course given through the medium of television?
6. Do you believe your students learned less, as much, or more than they might have had this course been presented using a traditional form of teaching? Why do you think this?
7. Do you believe your students were less, as much, or more motivated to learn than they might have been had this course been presented using a traditional form of teaching? Why do you think this? Did you notice anything about the pattern of grades? About completion of assignments? About attention during class? About attitudes towards learning and towards this subject?
8. As a teacher where do you see satellite teaching going in the future? What recommendations would you make?
9. Do you believe this course impacted the lives of your students outside the classroom? For example, might it have changed their

attitude towards homework? Towards going to college? Towards learning on their own?

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J. MINIGRANT REPORT -- James D. Wells

Final Report
"Isolating Effective Computer Aided Instruction Approaches in a Distance Learning Environment"

Presented To:

Midland Consortium Star Schools Project,
University of Kansas

By: James D. Wells
Associate Professor,
Russian Language and Literature
Oklahoma State University
1-405-744-9540

Table of Contents

Introduction

In the summer of 1989, Russian By Satellite proposed adding a transparent "monitoring" program to its existing record keeping software -- the Student Records Disk. The addition of the monitor would enhance the amount of statistical data recorded for each student during the computerized component of the course. Ultimately, we hoped our analysis of this data -- as compared to similar data collected from college and high-school students utilizing the software as an adjunct to normal instruction -- would suggest optimum approaches to computer assisted language instruction (CALI) in a distance learning environment.

Some Caveats

Almost immediately, we found implementation of our research in its original scope faced unexpected obstacles. The High-School instructor that agreed to use our software as an adjunct to in-class instruction transferred to a private school employing a different text. As Russian: Stage One is the grammatical basis for our software, utilizing another text necessitated an irregular implementation of computerized component, biasing the result.

A similar circumstance confronted implementation of the software component here at Oklahoma State. Unexpected obstacles to timely production of courseware materials prevented distribution of some materials to Oklahoma State's beginning Russian students coincident with classroom presentation of materials. Although some feedback was generated during coincident usage of Unit One and Two courseware materials (as well as useage of later Units in a review capacity) slower than expected production caused problems.

Another problem arose due to unforseen demands on the actual courseware by schools participating in the Russian By Satellite program. Teaching Partners at the remote sites were reluctant to allow students to take their Student Records Disks home for additional practice. Consequently, we were forced to create a "Homework" Student Records Disk. While the "Homework" disk emulated most of the functions of Student Records, it had the unfortunate side-effect of compromising the integrity of the "monitor."

Finally, we faced a compliance problem. In order to gather the "monitor" data we had to read a file stored on each disk. This necessitated the return of the disks from participating schools. Unfortunately, we received disks from less than 30% of twenty participating sites.

Reformulation

As one might expect, these setbacks made us rather skeptical about the value of our research. Indeed, from a statistical perspective, some of our conclusions may seem inadequately supported. On close examination of the available data: computer scores, monitor information, written grades, phone logs, and on-campus feedback, some approaches to CALI implementation in a distance learning environment are clearly more valid than others. More importantly, our experience has been an invaluable indicator of a number of obstacles facing CALI components of distance learning programs. With additional research, done by qualified people, to validate the p reliminary findings, Russian By Satellite's experiences may prove an effective guide to future Distance Learning programs that rely heavily on a computer component.

Conclusions and Observations

Even with somewhat limited data there emerges a clear pattern of improvment when students do any given computer drill multiple times. Scores commonly improved by 30 - 50%. The fact that students were given the opportunity to do unscored practice before moving on to scored drills and Mastery drills led to very high scores on their initial attempts.

Early in the semester, coordinating teachers told us that in many cases the students were simply looking at their neighbor's screen and copying answers. This forced us to develop a randomization of questions within any given subsegment drill. In addition to stopping the "sharing" it also stopped the simple pattern repetition, particularly in the shorter drills.

Our data and experience showed that there was a significant drop in the use of the computer drills in Chapter II. It was especially noticeable in the drills on Russian morphology (a key segment of beginning Russian). The failure to master these drills in Chapter II led to continuing problems in subsequent lessons. Since most of the basic verb morphology is covered in Chapter II, this forced us to develop a seperate Verb Diskette i.e., independant of Chapter II. This Diskette now contains all verb forms in Chapters I - V and is widely used by the students and seems to have solved our problem.

Ms. Speth requested that we include data on the male/female ratio of our students. There were 51 males and 57 females.

Toward the end of the first semester we sent each student a 44 question RBS course survey. The survey included questions on five basic aspects of the RBS program as follows:

A. General Information
B. The Broadcast
C. The Computer Component
D. Homework and Grading
E. The Hotline

The following items seemed to be significant

Students Response: "favorite and least favorite portions of the course":

84% Disliked the Homework
72% Considered Computer Component their favorite part of the course.
22% Felt the Broadcasts were their favorite part of the course.
23% Found Broadcasts their least favorite.

Students response to "I feel I learned the most from":

73% Computer Drills
14% Homework
13% TV Broadcase

Students response to "I feel that the broadcast adequately prepares me for homework and computer work".

75% Sometimes
16% No
10% Yes

Student response: ("The grammar explanations I find the most helpful are from the:

47% Computer drills
32% Tutorial Workbook
12% Hotline
9% TV Broadcast

Student response: "I find the help availble through the Telephone Hotline:

43% Useful
34% Very Useful
17% Don't use the hotline
6% Not very useful

Student response: " I find the explanations that appear in the Tutorial/Workbook:

64% Helpful
24% Not very helpful
20% Very helpfull
2% Practically Useless

Student response: " Instructor's English is"

58% Easy
17% Not very easy
16% Very Easy
9% Difficult

Student Response: "Instructors instructions and explanations are:

41% Not very easy
41% Easy
13% Difficult
5% Very Easy

It would appear that the computer component of this program has been received very positively and been very helpful to the majority of students. The tutorial notebook occupies the second most beneficial part of the course. In a distance learning environment it is essential that the students have a positive attitude toward the computer work which occupies the majority of their time. This seems to have been achieved with remarkable success.

The Russian By Satellite Program kept a complete log of all hot-line calls. It is of interest to note that student calls regarding difficulty with the computer drills occured almost exclusively in the first three weeks of the course when the students were getting used to the system. After this initial period virtually all calls involved questions on day-to-day learning very similar to those which would normally be answered by a teacher in the classroom.

Despite the limited data it does seem clear that the computer portion of the RBS course was not only effective and non-intimidating but indeed the student's favorite portion of the course. It is also apparant that the computer can and should be an integral part of any distance learning language program since it is the only possible substitute for a live-teacher who can interact on an individual basis with students.

APPENDIX D

COPY OF STUDENT SURVEY

AND

GRAPHS ON SIGNIFICANT QUESTIONS

RUSSIAN BY SATELLITE COURSE SURVEY

Please take a few minutes to fill out the following questionnaire. It covers all aspects of the Russian By Satellite course. This is your opportunity to tell us what we ought to be doing better, and what we are doing well. You may put your name if you choose. We hope to improve RBS with the help of those who know it best--our Students and Coordinators.

GENERAL INFORMATION

Please tell us a little about yourself, you may include your name if your wish:

Name:______________________________ School:____________________

1. I am ______________________________.
   - ____ a Freshman
   - ____ a Sophomore
   - ____ a Junior
   - ____ a Senior
   - ____ a Coordinator

2. My Grade Point Average is
   - ____ 3.5-4.0
   - ____ 3.0-3.5
   - ____ 2.5-3.0
   - ____ 2.0-2.5
   - ____ 2.0 or lower
   - ____ I'd rather not say.

3. I expect to receive a ____________________ in Russian By Satellite
   - ____ an "A"
   - ____ a "B"
   - ____ a "C"
   - ____ a "D" or "F"

4. My favorite part of the Russian By Satellite course is
   - ____ the Broadcast
   - ____ the Computer Drills
   - ____ the Homework

5. My least favorite part of the course is
   - ____ the Broadcast
   - ____ the Computer Drills
   - ____ the Homework

6. I feel that I learn the most from
   - ____ the Broadcast
   - ____ the Computer Drills
   - ____ the Homework

7. I use the Telephone Hotline for extra help
   - ____ very often (1/week or more)
   - ____ often (1/every two weeks)
   - ____ not very often (1/month)
   - ____ never

8. The one thing about this course I would change if I could is: (use the back of this sheet if necessary)

THE BROADCAST

1. Professor Dmitriev's English is
   ____ very easy to understand
   ____ easy to understand
   ____ not very easy to understand
   ____ difficult to understand

2. Professor Dmitriev's instructions and explanations are
   ____ very easy to understand
   ____ easy to understand
   ____ not very easy to understand
   ____ difficult to understand

3. I answer Victor's questions with the studio audience
   ____ very often
   ____ often
   ____ not very often
   ____ almost never

4. Do you watch the Broadcast live?
   ____ yes
   ____ no

5. Do you have a speaker phone in the classroom?
   ____ yes
   ____ no

If you answered yes to questions 4 & 5, please answer question 6.

6. If you watch the Broadcast live, would you like to participate through your speaker phone
   ____ yes
   ____ no

7. Do you like the "Let's Get Acquainted" film series during the breaks?
   ____ yes
   ____ no

8. Was it helpful to get an English explanation and a vocabulary preview of "Let's Get Acquainted" before seeing the film segment?
   ____ yes
   ____ no

9. Do you find the other educational breaks interesting and informative?
   ____ yes
   ____ no

10. I think having actual students learning in the studio on camera helps make the broadcast more like a classroom.
______ yes
______ no

11. I think having students in the studio helps me learn.
______ yes
______ no
______ I don't think it matters

12. I find the use of Russian words shown on the screen during broadcasts helpful.
______ yes
______ no
______ indifferent

13. I would like to have more work during broadcasts with words and exercises shown on the screen
______ yes
______ no
______ indifferent

14. I feel involved in the broadcast class so that Professor Dmitriev is not just a "talking head."
______ yes
______ no
______ indifferent

15. I feel, in general, that the broadcast adequately prepares me for my homework and computer work.
______ yes
______ sometimes
______ no

COMPUTER COMPONENT

1. I spend ______________________ time on the computer each week.
   ____ 4 hours or more
   ____ 3 to 4 hours
   ____ 2 to 3 hours
   ____ 1 to 2 hours

2. I ____________ come in before or after class to spend more time on the computer.
   ____ often (2 times a week or more)
   ____ sometimes (1-2 times a week)
   ____ rarely (1 time every two weeks)
   ____ never

3. I wish I had more time on the computer.
   ____ yes
   ____ no

4. My favorite computer drills are:
   ____ Logical Response
   ____ Dictation
   ____ Grammar Review Drills
   ____ Segment Masteries
   ____ Preview Lesson Mastery
   ____ Lesson Mastery
   ____ Vocabulary

5. My least favorite computer drills are:
   ____ Logical Response
   ____ Dictation
   ____ Grammar Review Drills
   ____ Segment Masteries
   ____ Preview Lesson Mastery
   ____ Lesson Mastery
   ____ Vocabulary

6. I learn the most from
   ____ Logical Response
   ____ Dictation
   ____ Grammar Review Drills
   ____ Segment Masteries
   ____ Preview Lesson Mastery
   ____ Lesson Mastery
   ____ Vocabulary

7. I use my Workbook, Textbook, and other materials ______ while doing my Computer work.
   ____ often
   ____ sometimes
   ____ rarely
   ____ never

HOMEWORK AND GRADING

1. In general, I find the explanations that appear in the Tutorial/Workbook
   _____ very helpful
   _____ helpful
   _____ not very helpful
   _____ practically useless

2. The grammar explanations I find the most helpful are
   _____ the Tutorial/Workbook explanations
   _____ the explanations on the Broadcast
   _____ the explanations on the Computer
   _____ the explanations I get from the Hotline

3. In general, I think the grading of my assignments has been
   _____ very fair
   _____ fair
   _____ usually fair
   _____ unfair

4. I receive my graded assignments from Russian By Satellite in a timely manner.
   _____ yes
   _____ no

5. I would like to receive my graded assignments much faster.
   _____ yes
   _____ no
   _____ don't care

6. I find the comments on my papers
   _____ very helpful
   _____ helpful
   _____ not very helpful
   _____ useless

7. My biggest complaint about the homework assignments is: (explain in whatever detail gets your point across)

THE HOTLINE

1. In general, I find the help available through the Telephone Hotline
   ____ very useful
   ____ useful
   ____ not very useful
   ____ I have not used the Hotline

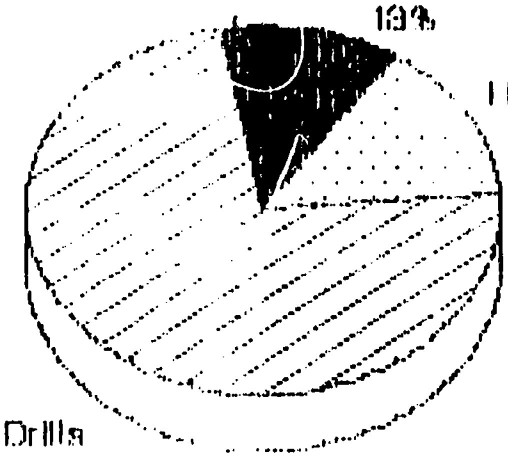
If you use the Hotline, please answer the following two questions.

2. I use the Hotline for (check all that apply)
   ____ Grammar Help
   ____ Computer Help
   ____ Questions about Grades or Homework

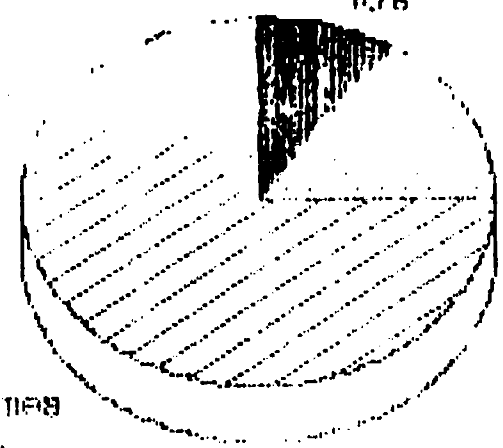
3. One thing I would change about the Hotline services available is (explain in whatever detail gets the point across)

Russian By Satellite Survey

I feel that I learn the most from the:

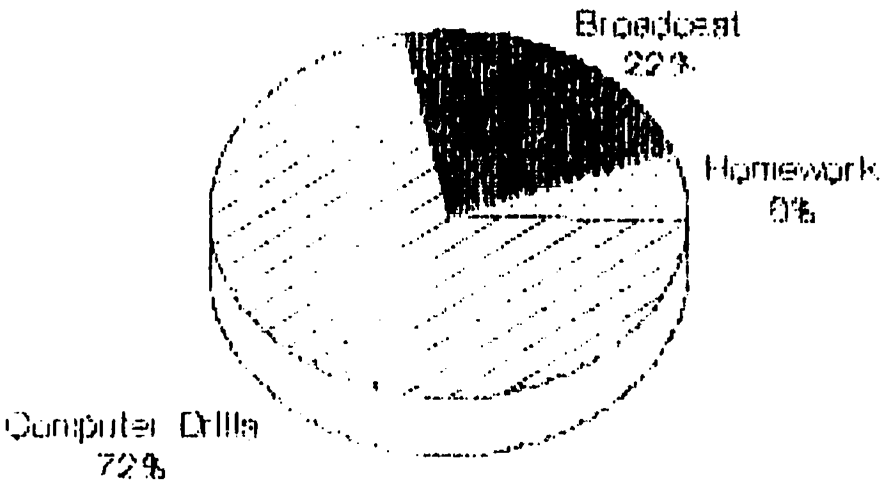


I feel that the broadcast adequately prepares me for my homework and computer work.

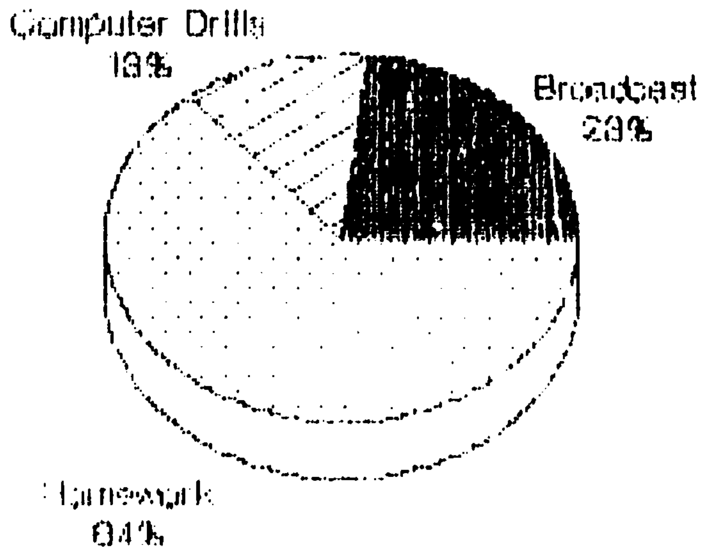


Russian By Satellite Survey

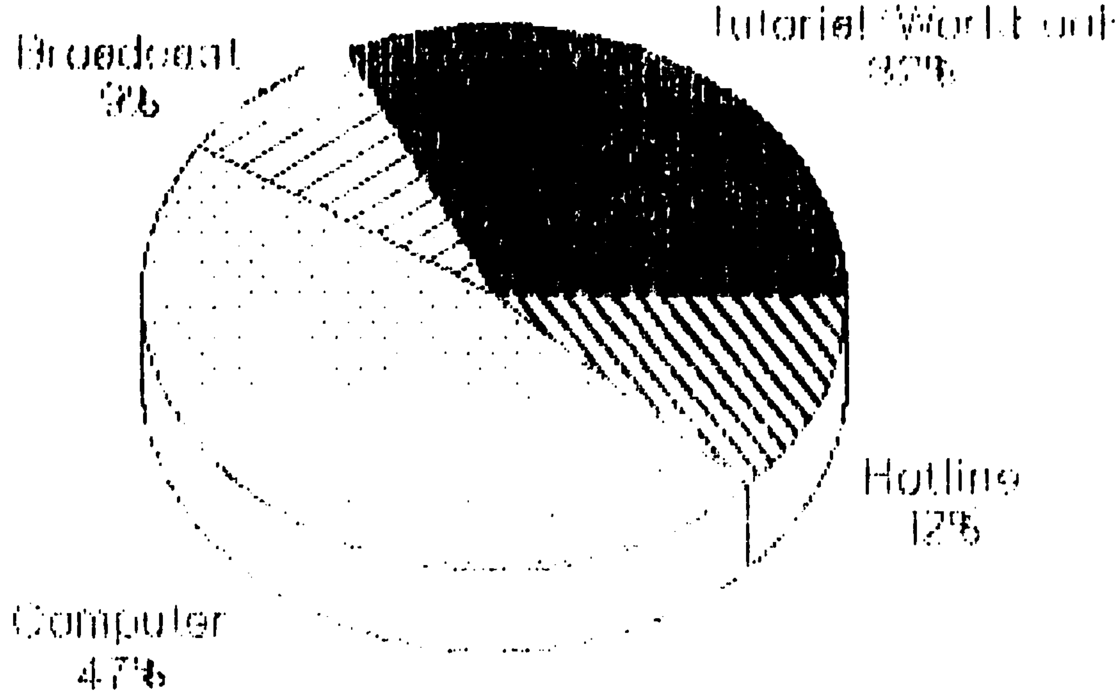
My favorite part of the Russian By Satellite course is:



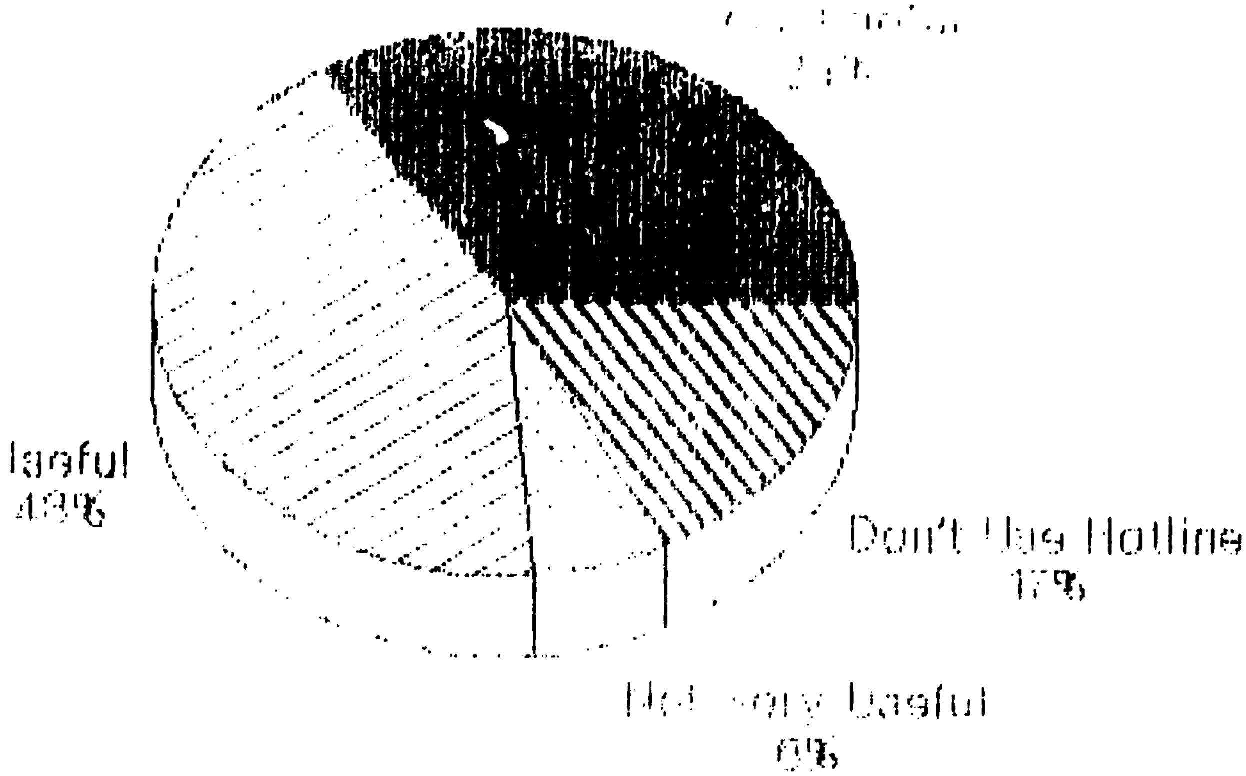
My least favorite part of the course is:



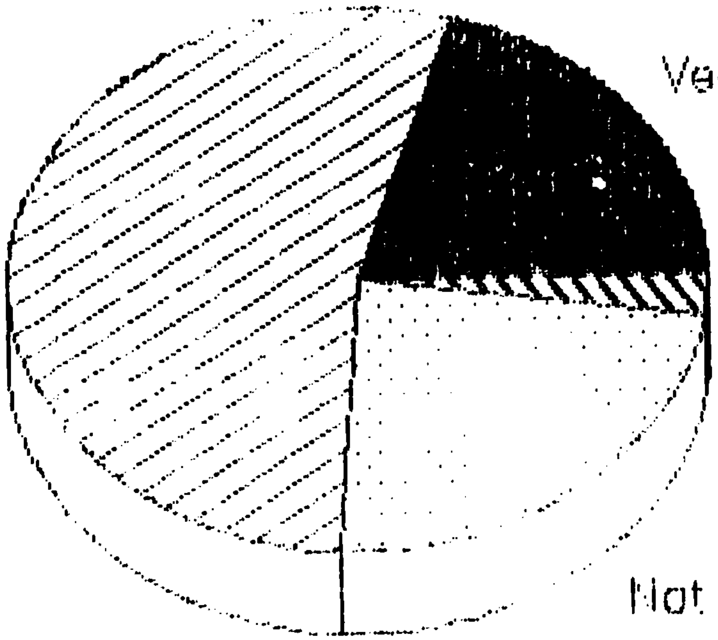
The grammar explanations I find the most helpful are from the:



I find the help available through the Telephone Hotline:

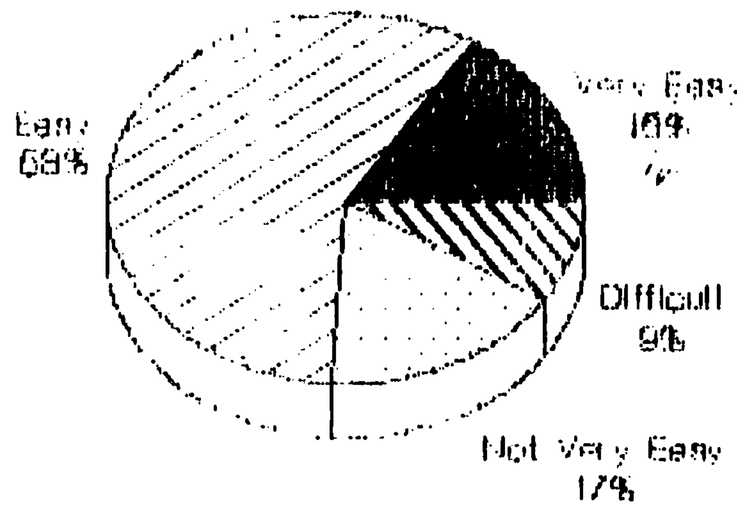


I find the explanations that appear in the Tutorial/Workbook:

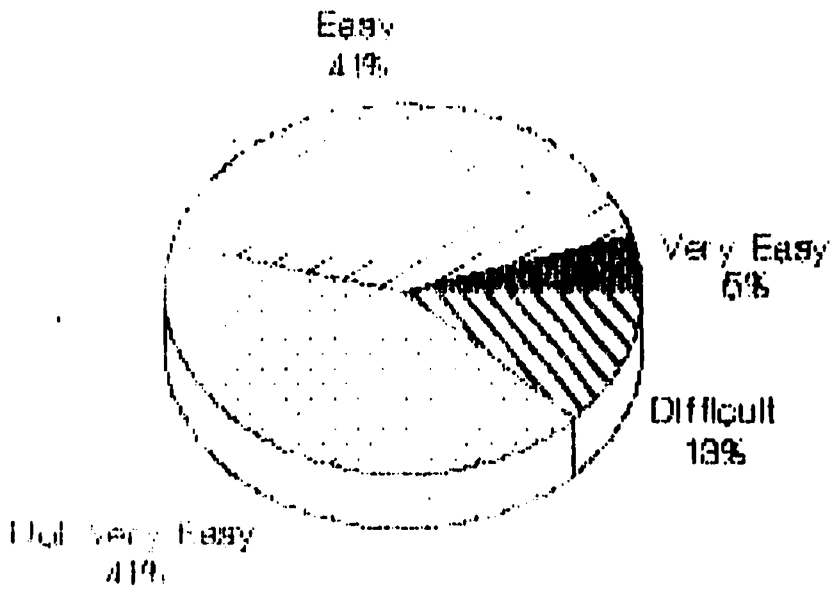


Russian By Satellite Survey

Professor Dmitriev's English is:



Professor Dmitriev's instructions and explanations are:



K. MINIGRANT REPORT -- Connie Dillon

INNOVATION AND INSTRUCTIONAL TELECOMMUNICATIONS: THE INTEGRATION OF SATELLITE TECHNOLOGY AND THE PROFESSIONAL DEVELOPMENT OF PUBLIC SCHOOL TEACHERS

Introduction

The purpose of this research is to explore the role of the teaching partner within the Star Schools model for the satellite delivery of instruction to public schools. A variety of models exist for the delivery of telecommunications instruction. However, the Star Schools model is of particular interest due to predominant role of the receiving site facilitator.

The Star Schools programming is delivered via satellite by a University Professor, who serves as the primary content specialist. The video portion of the programs is delivered live from the sending site with two-way audio communication available via a toll free number, with the exception of one site per period which is linked into a live "on-line" audio link. Thus one receiving site per period can interact directly with the instructor at the sending site. The receiving sites are located throughout the contiguous United States.

Each sending site provides the necessary equipment and under the Star Schools model, requires a certified teacher be present in the classroom. The qualifications of this teacher vary with the demands of the course. Some courses required a teacher certified in the content areas, and others do not. For purposes of this student, these teacher/facilitators are called "teaching partners."

The problem this research seeks to explore is the relationship between the integration of satellite technology and the related professional development of the teaching partners participating in the Star Schools Project.

Review of the Literature

The use of satellite technology within instructional settings offers many opportunities to bridge the gap between educational resources and educational needs. Regardless of instructional effectiveness, no instructional innovation will be successful unless it has been properly integrated within the system in which it is designed to function. Lindquist (1978) suggests that for an innovation to be successful it must "fit the local scene" and be perceived as "belonging to those whom it affects". Successful integration of technology requires support from both the administrators who must commit scarce resources to the program and from the teachers who must work within the program. This research proposes to explore the integration of satellite technology within participating Star Schools from the perspective of the teaching partners.

The reception of instruction is critical to the effectiveness of that instruction. However, the glamor of television production and satellite distribution tends to reduce the attention given the receiving site. Although what happens at the receiving site is very important to the instructional process (Richardson, 1980), the activities at the receiving site all too often play "second fiddle" to the activities at the sending site.

All instruction requires two-way communication. Baath (as cited in Keegan, 1986) stresses the importance of the local facilitator within distance education systems. The role of this individual is greater than simply "correcting errors and assessing student's papers" (p. 95). The receiving site facilitator is an important link between student learning and learning materials, providing the learner with reinforcement, learning activities and linkage between new information and prior learning. As the primary source of continuous interaction between learner and content, this facilitator provides the personal relationship with the learner which ultimately promotes student motivation and pleasure with the process.

One important feature of the Star Schools Project is the distant site facilitator, or "teaching partner". However, the use of satellite technology is an innovation which requires that these teachers make significant changes in their accustomed methods and practices. Lindquist (1978) stresses the importance of institutional rewards upon the adoption of an innovation.

Rewards can be both personal and institutional, that is contributing to the professional advancement and self esteem. Institutions can also provide rewards by overcoming the barriers associated with the innovation, through technical support and proper training.

The Star Schools project provides an excellent opportunity to study the relationship between the nature of administrative support, the professional development of public school teachers and the successful integration of instructional telecommunications.

Methods and Procedures

This study is designed as an exploratory one, thus the data gathering techniques were selected which could provide a "landscape" view of the program, rather than a detailed "portrait".

A questionnaire was distributed to a population of teaching partners. The analysis of the data was primarily descriptive, using means, standard deviations, and frequency distributions. The survey was designed based upon the design of similar surveys conducted with university faculty using instructional telecommunications.

An advisory committee representing participating university professors, teaching partners and Star Schools administrators provided input into the content and design of the survey. The advisory committee also assisted with the selection of the population of the survey.

Delimitations

Prior to the administration of the surveys, each university professor who serves as the content specialist for the courses was asked to release the names and addresses of the teaching partners associated with their course. However, at the initial meeting the research discovered that many of these professors did not want to give permission due to concerns about the intrusion of the research process upon the cooperation and continuation of the program within the public school systems. Thus the population of this study is not representative of the entire "teaching partner" population.

Some professors refused to give approval to distribute surveys. However, the professors of languages and mathematics gave approval as long as these schools had not been a part of another study.

Thus the population of this study included all teaching partners in languages and mathematics, who were not a part of another study. Fortunately, the languages and mathematics areas were cooperative, and these have been the subject areas with the longest history. The researchers are hopeful that the data provided, though not representative, will still fulfill the original purpose of "exploring" the topic.

Findings

Demographics

Of the 282 teachers surveyed, 95 returned responses. Follow-ups were not administered due the the "intrusion" concerns expressed by the advisory committee.

Responses were received primarily from teacher partners who participated in language and mathematics courses, although a few responses were received from teachers participating in all other programs offered. Of the teachers responding to the survey, 62 percent participated in the German I program, 16 percent in AP Calculus, and 12 percent in German II.

The majority of the respondents were from Oklahoma (45 percent), Missouri (12.6 percent) and Mississippi (10.5%). Nine percent of the respondents came for the Eastern United States, 21 percent from the Midwest, 7 percent from the West, 12.6 percent from the Southeast, and 49.5 percent from the Southwest.

The teaching partners responding the the survey are highly educated, as 88.5 percent reported having completed work beyond the bachelor's degree. Over one-fifth of the teachers (23.2 percent) hold the master's degree and 35.8 percent have done work beyond the master's. Likewise they are veteran teachers as thirty-eight percent have taught at their present school for more than ten years, and nearly two-thirds (63.2 percent) have been employed as a teacher for over 10 years.

For 41 percent of the teachers, this represents their first year as a teaching partner, 18 percent have participated for one year, 27 percent for two and the remaining 14 percent have participated between three and five years.

Attitudes

Regarding the teaching partners perception of the course rigor, a surprising 62 percent felt that the satellite course was more difficult than the similar traditional course and 35 percent felt the difficulty was about the same. Only 4 percent felt the satellite course was less difficult. Likewise 43 percent felt that the students in the satellite course performed better than students in similar traditional classes, 37 percent felt the students performed at the same level and 20 percent felt the students did not perform as well as the students in similar traditional classes.

Regarding workload, 38 percent of the respondents felt that the teacher workload was equivalent to the other classes they taught, twenty percent felt the workload was greater and a surprising 41 percent felt the workload was less.

Over sixty percent (63 %) indicated that their school plans to continue participating in the satellite program, 32 percent were not sure, and five percent indicated that their school intends to drop out of the program.

Regarding the issues of prestige among their peers, the teaching partners indicated a somewhat more favorable attitude about satellite teaching than they perceived from their colleagues. On a five point scale (with five high), the mean response to the items regarding their attitude toward this experience was 4.35 and the mean response regarding perception of colleagues was 3.88.

Professional Development

Ideally, the activities of the distance education facilitator go beyond the mere collecting and marking of exams to include such tasks as linking learning materials with prior learning and experience, reinforcement, motivation, and mentoring.

Do the teaching partners do this? According to the data collected in this study, they do not. When asked to compare the tasks required by the satellite course and the traditional class, the teaching partners indicated that the activities which are more important in the satellite class are mailing exams, facilitating student communication with the satellite instructor and maintaining communication with the satellite instructor and staff. The activities which are less important in the satellite course are preparing and grading exams, leading class discussion, answering questions during class, answering questions outside of class, organizing class activities, lecturing, curriculum design and preparation of resources. Activities which are about the same are distribution and collection of exams and assignments, distribution and collection of course materials, preparing equipment, maintaining discipline, preparing the facility, providing the student with computer support, motivation, mentoring, supervising class activities, taking roll, operating equipment, and keeping students on task.

When asked about the role of administrative support in the success of the satellite learning experience, the teachers indicated that the following were important (ordered from most important to least important) : lecture guides, teaching partner manual, student-teaching partner interaction, computer software, local administrative support, television lessons, professor-teaching partner interactions, opportunity to meet the satellite instructor, Star Schools coordinator, local site technical support, assignments, and lastly, teaching partner training (the majority of respondents indicated that training was not applicable).

A content analysis on the open ended items shed some light upon the role of the satellite program on the personal/professional development of the participants. Surprisingly, the majority of responses were very positive. The most common response related to the opportunity to learn new content, typified by the comment "I could work on my masters degree with more confidence" or "it has given me a chance to become certified in a field I had not otherwise considered".

Another important benefit of this program related to the opportunity to learn about the new technologies and new teaching methods.

An interesting finding is the comment made by many of the participants relating the opportunity to mentor with other teachers. Comments such as "I have gained from the experience of an excellent professor", "I needed a teaching partner", and "this has rejuvenated my enthusiasm for teaching" were representative.

A minority of responses relating to barriers of the satellite program to professional development were concerned with the lack of contribution required of the teaching partner. Comments such as "the teacher needs only to be a strict disciplinarian to teach this course", "I don't do much interaction", "I feel like a baby sitter", and "I see how hard it is to learn from television" were typical.

Conclusions

The responses of the teaching partners indicated that the professional development opportunities provided by the satellite teaching experience are very positive. A unique contribution is the relationship between the teaching partner and the university professor. This relationship should be explored and designed into the "teaching partner" experience.

A concern is the training of the "teaching partners," and the discrepancy between what the teaching partners actually do and what they feel is important that they do. Research should be conducted to identify the capabilities required for a facilitator and teaching partners should be trained in distance education techniques. Teacher education programs should investigate the possibility of offering study in the techniques of distance teaching.

Finally, evaluation efforts should involve all parties. The university faculty are "gatekeepers" to the investigation. Without their support, further research will be hampered. Distance education evaluation should ensure that all stakeholders have ownership in the evaluation effort.

L. FIRST SURVEY, "ABOUT YOU AND YOUR SCHOOLWORK"

ABOUT YOU AND YOUR SCHOOLWORK

You have been selected to take part in a project looking at how students react to their experiences in school. To make comparisons, a large number of questions are being asked which come at the problem in different ways. Do not spend much time on each question, give your first reaction and move on to the next one.

After you have completed this survey your teacher or teaching partner will collect your answer sheets and seal them in an envelope which will be returned directly to the researchers. None of the information in your answers will be seen by anyone in your school.

It is very important that the answers you give are what you really feel, not what you think others would like you to say. Your answers will be important in determining how much courses by satellite help different kinds of students.

DIRECTIONS

Your responses to all survey items are to be recorded on the blue answer sheet provided. Please mark your choices using a No. 2 lead pencil.

(1) Begin by printing your last name, your first name and then your middle initial in the NAME section of the answer sheet (leaving a space between each). Be sure to darken the corresponding letter/circle below your name.

(2) Now go to the SEX grid, and darken M for male or F for female.

(3) Below the SEX grid, darken the circle indicating what GRADE you are in now.

(4) Next, go to the lower left hand corner, in the BIRTH DATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.

Beginning with item #1, darken the corresponding circle on the answer sheet to indicate your response. Be sure to completely darken the circle. If you erase, erase completely. After completing the survey, return the survey and answer sheet to your teacher. Thank you for your help.

Now begin with item 1 on the answer sheet and answer the next ten questions.

OVER

Directions: Begin with question #1. Respond by choosing the one alternative that best answers the question for you. Mark your response (A, B, C, D or E) on the blue answer sheet. If you are not sure how to mark your answer sheet ask your instructor for assistance. Thank you.

1. What is the main reason you enrolled in the satellite course?

   A. Very interested in the subject
   B. To prepare for college or a career
   C. There was no other course I wanted to take
   D. Someone made me take it. It was required.
   E. Some other reason

2. Who was most responsible for your enrolling in the satellite course?

   A. No one, I decided on my own
   B. My parents or other family members
   C. School administrator or guidance counselor
   D. A teacher
   E. Other students

3. Is English the primary language spoken in your home?

   A. Yes
   B. No

4. What is the highest grade your mother completed in school?

   A. eighth grade or less
   B. started but did not finish high school
   C. high school graduate
   D. started college but did not graduate
   E. college graduate

5. What is the highest grade your father completed in school?

   A. eighth grade or less
   B. started but did not finish high school
   C. high school graduate
   D. started college but did not graduate
   E. college graduate

6. How did you think you ranked in your class last semester?

   A. among the best
   B. above average
   C. average
   D. below average
   E. poorest

7. Which of the following sounds most like the grades you usually get on your report card?

   A. Mostly A's, B+'s
   B. Mostly B's, a few B+'s
   C. Mostly C's, a few C+'s
   D. Mostly D's, a few C's
   E. Mostly D's, a few F's

8. When you do really well in a course, which of the following explanations do you usually give?

   A. You worked hard.
   B. You are good in that subject
   C. It was an easy course
   D. You were lucky

9. When you do poorly in a course, which of the following explanations do you usually give?

   A. You didn't work hard enough
   B. You are not very good in that subject
   C. It is a difficult subject
   D. You had some bad luck

10. Good luck is more important than hard work for success.

   A. Strongly agree
   B. Agree
   C. Not sure
   D. Disagree
   E. Strongly disagree

Now please read these instructions:

The remaining questions contain comments which might be made by students about themselves and about their work in school. To what extent do you agree or disagree with each comment? As the comments are based on personal experience there can be no "right" or "wrong" answers. If you do not understand a question, leave it blank. Respond to each comment using this scale:

A = **DEFINITELY AGREE with the comment**
B = **AGREE to some extent**
C = **CAN'T DECIDE**
D = **DISAGREE to some extent**
E = **DEFINITELY DISAGREE with the comment**

Continue marking the answer sheet beginning with item 11.

11. I try to see the connections between ideas in one subject and those in another.
12. I find it easy to understand teachers' instructions about work.
13. I have to rely on memorizing a good deal of what we have to learn.
14. It's difficult for me to organize my study time.
15. I'm good at planning my study time effectively.
16. It's important to me to do really well in my courses.
17. I try to see each new topic as a whole before I start working on it.
18. I prefer to look at each part of a topic or problem in order, working through it one step at a time.
19. If I can just barely pass the tests in my courses, that will be enough for me.
20. I get tense and anxious about work that is due.
21. I enjoy helping other students with their problems in schoolwork or in other things.
22. I get so interested in some topics at school that I try to read more about them on my own.
23. If I'm given something to do, I try to do it as well as possible.
24. I enjoy talking to my parents about the things that happen in school.
25. My parents demand a lot of me and expect me to work hard.

OVER ☞

Respond to items 26 through 49 using the following scale.

A = **DEFINITELY AGREE** with the comment
B = **AGREE** to some extent
C = **CAN'T DECIDE**
D = **DISAGREE** to some extent
E = **DEFINITELY DISAGREE** with the comment

26. Most of my friends have little interest in schoolwork.

27. I generally try to understand things, even when they seem difficult at the beginning.

28. I can usually pick out the important points in a lesson or book.

29. Often I have to read things without having a chance to really understand them.

30. I'm rather slow at starting my homework.

31. It's easy for me to find information in books.

32. It is important for me to do things better than my friends, if I possibly can.

33. Interesting problems often set me off on long chains of thought.

34. I prefer to stick to one approach to a problem until I'm sure it won't work.

35. I could probably do better in my courses if they were more interesting.

36. When the first question on a test is really hard, I get scared.

37. It makes me feel really good when my classmates see that I've done well.

38. Often I follow up interesting ideas mentioned in class.

39. I put a lot of effort into what we're asked to do in school.

40. My parents are really happy when I do well at school, and that makes me feel good, too.

41. In schoolwork, my parents expect me to meet high standards.

42. I enjoy fooling around in class with my friends.

43. I often ask myself questions about the things I hear in lessons or read in books.

44. If conditions are not right for me to study, I always try to do something to change them.

45. I read very little beyond what is required.

46. If I'm interrupted, I find it difficult to get back to work.

47. I'm good at taking notes.

48. I get a kick out of getting better grades than other students.

49. I like to come up with my own ideas, even if they don't get me very far.

Respond to items 50 through 71 using the following scale.

A = **DEFINITELY AGREE** with the comment
B = **AGREE** to some extent
C = **CAN'T DECIDE**
D = **DISAGREE** to some extent
E = **DEFINITELY DISAGREE** with the comment

50. When explaining something, I usually give a lot of detail.

51. I sometimes wonder if it's worthwhile for me to stay in school.

52. I worry about whether I'll be able to cope with my courses.

53. I enjoy talking over my work with friends in my class.

54. There are a lot of lessons which I find exciting and challenging.

55. I would rather be corrected than left to do something wrong.

56. My parents are ready to talk over anything at school that is worrying me.

57. My parents always take my report cards seriously.

58. It's important to me to go along with what my friends are doing even if it means fooling around in class.

59. I try to relate what I read to previous work.

60. I plan my working time carefully to make the best use of it.

61. I prefer subjects in which the facts to learn are easy to see.

62. I am easily distracted from my homework.

63. I usually know how to go about preparing for tests.

64. I even try to get the highest grade in subjects I don't like.

65. I tend to jump to conclusions.

66. I'm very cautious about accepting what I read without having thought it through first.

67. Studying doesn't help me very much.

68. I often get discouraged about my schoolwork.

69. I feel really good when teachers tell me they are pleased with how hard I've tried.

70. I don't mind working hard if I learn something really worthwhile.

71. I feel badly when I don't do as well as I could in school.

Respond to items 72 through 90 using the following scale.

A = **DEFINITELY AGREE with the comment**
B = **AGREE to some extent**
C = **CAN'T DECIDE**
D = **DISAGREE to some extent**
E = **DEFINITELY DISAGREE with the comment**

72. My parents are always helpful and encouraging about my schoolwork.

73. My parents try to make sure I can do my homework without interruption.

74. It's very important to me to have the same sort of things as my friends.

75. When I am trying to understand new ideas, I often try to see how they might apply in real life situations.

76. When I'm doing a piece of work, I try to see how to get the highest possible grade on it.

77. I like to be told exactly what to do in the work we are given.

78. I never seem to have enough time to finish my work.

79. I am good at reviewing a whole semester's work.

80. I like class activities in which I get to compete against my classmates.

81. When I'm trying to remember something, I can often see or hear it in my mind.

82. When I'm learning, I like things to be clearly set out under headings or lists.

83. I don't see how the classes I am taking now will help me in life.

84. I find it very hard to talk in front of the class.

85. I really enjoy discussing ideas about life in general with my teachers.

86. I get enthusiastic about some of my schoolwork.

87. I like taking responsibility for my own learning.

88. If I do well in school, my parents always show that they are pleased with me.

89. My parents expect me to find enough time to do my homework well.

90. Being with my friends often makes me late for class, or late getting home.

Thank you for completing this survey. Please return the survey and your answer sheet to the person who gave it to you.

M. SECOND SURVEY, "ABOUT THIS CLASS"

ABOUT THIS CLASS

This questionnaire contains comments which might be made by students about this class. To what extent do you agree or disagree with what they say? Because the comments are based on personal experience, there can be no "right" or "wrong" answers. It is very important that the answers you give are what you really feel, not what you think others would want you to say. Your answers will be important in determining how well this course helps different kinds of students.

After you have completed this survey, fold the answer sheet twice, put it in the envelope you have been given, and seal the envelope. Then give the envelope to your teacher or teaching partner to be returned to the researchers unopened. None of the information in your answers will be seen by anyone in your school.

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DIRECTIONS

Your responses to all survey items are to be recorded on the blue answer sheet provided. Please mark your choices using a No. 2 lead pencil.

(1) Begin by printing your last name, your first name and then your middle initial in the NAME section of the answer sheet (leaving a space between each). Be sure to darken the corresponding letter/circle below your name.

(2) Now go to the SEX grid, and darken M for male or F for female.

(3) Below the SEX grid, darken the circle indicating what GRADE you are in now.

(4) Next, go to the lower left hand corner, in the BIRTHDATE grid and darken the month, day and year you were born. You are now ready to begin responding to the survey items.

Beginning with item #1, darken the corresponding circle on the answer sheet to indicate your response. Be sure to completely darken the circle. If you erase, erase completely. After completing the survey, fold the answer sheet once, put it in the envelope provided, seal the envelope and return it to your teacher. Thank you for your help.

Now begin with item 1 on the answer sheet.

The following items are comments which might be made by students about this class. To what extent do you agree or disagree with each comment? Respond using the following scale:

A = Definitely agree with the comment
B = Agree to some extent
C = Disagree to some extent
D = Definitely disagree with the comment
E = Question does not apply to this course

1. The teacher and students worked together as a team to make this course successful.
2. We were given enough time to understand what we were learning.
3. The teacher stressed that it was important for us to do well.
4. The teacher talked about how to study for this class.
5. The teacher was good at explaining difficult ideas.
6. We had too many quizzes just to see what we remembered.
7. The teacher set high standards.
8. We had to memorize many rules or laws without understanding them.
9. We were encouraged to ask questions and seek help when we needed it.
10. The teacher helped motivate us to do our best.
11. The teacher gave advice which did not apply directly to our daily work.
12. We were given about the right amount of work.
13. The teacher was enthusiastic about teaching this subject.
14. We were encouraged to study together outside class.
15. I had trouble getting my questions answered.
16. The teacher presented the lessons at the right level for us.
17. We were expected to plan our free time to meet assignment deadlines.

Respond to items 18 through 34 using the following scale:

A = Definitely agree with the comment
B = Agree to some extent
C = Disagree to some extent
D = Definitely disagree with the comment
E = Question does not apply to this course

18. We had a good idea of where we were going and what was expected of us in this class.

19. The teacher presented the lessons in a well-organized way.

20. Students were pressured to compete academically.

21. We discussed how we were going to learn things with the teacher.

22. The assignments were generally clear and helpful.

23. The tests allowed us to include our own ideas.

24. The teacher made sure we paid attention.

25. The teacher could have made the subject more interesting by using some examples.

26. We were encouraged to think things out for ourselves.

27. The teacher made a real effort to understand difficulties students were having with their work.

28. The assignments asked us to be creative when we did not know the basics.

29. This course attempted to cover too much material.

30. It seemed important to the teacher that we learned the material well.

31. Some assignments allowed us to work together in class.

32. The teacher tried to understand difficulties students were having with the course.

33. It was easy to see how each lesson built on the ones before.

34. We had to make good use of our time in order to study effectively.

Respond to items 35 through 50 using the following scale:

A = Definitely agree with the comment
B = Agree to some extent
C = Disagree to some extent
D = Definitely disagree with the comment
E = Question does not apply to this course

35. The teacher really cared about what the class did.

36. The teacher made it clear in advance what we were going to learn and why we needed to learn it.

37. We spent a lot of time preparing for and taking tests.

38. The teacher helped us learn how to locate information.

39. The teacher was good at making clear what we had to do.

40. We were seldom asked to apply what we had learned or to explain relationships among facts or ideas.

41. The teacher kept a close eye on whether we did our homework.

42. Assignments required us to remember so many details in order to get a good grade.

43. We could make some of our own decisions on how to learn in this class.

44. The teacher gave suggestions for studying the material in this course.

45. The teacher skipped around in the book so much.

46. We had enough time to finish the work we were given.

47. The teacher was friendly and encouraging to students who asked questions.

48. I missed being able to talk to my classmates.

49. The teacher's answers were hard to understand.

50. The teacher helped us make connections between different topics.

Respond to items 51 through 68 using the following scale:

A = Definitely agree with the comment
B = Agree to some extent
C = Disagree to some extent
D = Definitely disagree with the comment
E = Question does not apply to this course

51. This class was a good preparation for the type of independent study that college or university students have to do.

52. There were few discipline problems in this class.

53. The teacher allowed enough time for student participation.

54. Most of us are concerned about qualifications for entering college or getting a good job.

55. We were given enough guidance to know how to prepare for tests.

56. The teacher summarized each lesson to help us see the main points.

57. The tests allowed us to show what we really knew.

58. The teacher made sure we put a lot of effort into our work in class.

59. The teacher gave us a lot of detailed factual information.

60. Students had to take responsibility for planning their own work.

61. The teacher cared about us as individuals.

62. The teacher gave us an overall picture without getting stuck on the details.

63. We were given so much to remember, there was no time to think.

64. The teacher seemed to enjoy working with us.

65. This class gave students a chance to learn from each other.

66. The teacher really listened to students.

67. The teacher was good at showing how the subject matter was linked to everyday life.

68. We could not depend on the teacher to tell us everything we needed to know.

Respond to items 69 through 85 using the following scale:

A = Definitely agree with the comment
B = Agree to some extent
C = Disagree to some extent
D = Definitely disagree with the comment
E = Question does not apply to this course

69. The teacher made it clear right from the start what was expected from students.

70. The teacher avoided wasting time.

71. Getting a good grade was the most important thing.

72. The teacher helped us use our study time wisely.

73. It was difficult to identify the important points made by the teacher.

74. In this class, we were tested over what we remembered, not what we understood.

75. When we were asked do something in class, the teacher checked that it had been done.

76. The teacher worked through the chapters without skipping around the book.

77. We had to work on our own more than in most classes.

78. The teacher worked to make this course interesting.

79. The TV instructor gave us opinions instead of facts.

80. We had so much homework, we often had to work late.

81. The teacher got excited about some of the ideas we were learning.

82. We had to work on our own too much.

83. Students received good answers to their questions.

84. The teacher helped us see the relationship between new material and what we already knew.

85. This class gave us an idea of what college courses might be like.

86. I could not keep up with my work in this class.

a. definitely agree
b. agree to some extent
c. disagree to some extent
d. definitely disagree

87. I prefer instruction by satellite over a regular course.

a. definitely agree
b. agree to some extent
c. disagree to some extent
d. definitely disagree

88. I am considering further study of this subject.

a. yes, definitely
b. yes, but only if it is required
c. no
d. uncertain

89. I would recommend this course to another student.

a. yes, definitely
b. yes, but only as a last resort
c. no
d. uncertain or depends on the student

90. Overall, how would you rate this course?

a. among the best
b. above average
c. average
d. below average
e. among the poorest

91. About how many hours per week did you spend studying for this course?

a. less than one hour
b. 2-3 hours
c. 4-5 hours
d. 6-7 hours
e. more than 7 hours

92. Do you think this course expected too much, too little, or about the right amount of motivation from students?

a. too much
b. about the right amount
c. too little
d. uncertain

93. Do you think this course expected too much, too little, or about the right amount of study skills from students?

a. too much
b. about the right amount
c. too little
d. uncertain

94. What kind of grades do you usually get in all your courses?

a. mostly A's, some B's
b. mostly B's, some A's and C's
c. mostly C's, some B's and D's
d. mostly D's, some C's and an occasional F
e. mostly F's, some D's

95. What grade do you expect to get in this course?

a. A or A+
b. B+ or A-
c. B or B-
d. C or C-
e. D or F

96. How much have you learned in this course?

a. more than I expected
b. about as much as I expected
c. less than I expected
d. much less than I expected

97. How confident would you be about taking this subject in college?

a. very confident
b. somewhat confident
c. not very confident
d. anxious and scared

98. How often did _you_ call in questions or to get information during this course?

a. never
b. once or twice
c. 3-5 times
d. 6-10 times
e. more than 10 times

99. How much of the material covered in this class do you think you learned?

a. most of what was covered
b. a lot, but there were parts I never did learn
c. about half, maybe a little more
d. less than half, but I did learn some things
e. not too much, there was little I learned

Thank you for completing this survey. Please fold your answer sheet and seal it in the envelope provided. Return the envelope to the person who gave it to you. Have a great summer!

N. NEEDS ASSESSMENT FORMS

Midlands Consortium
Research and Evaluation Center

Study of Satellite Programming Needs

Please identify yourself: ______________________________

Your school district: ______________________________

Mailing address: ______________________________

<u>Directions</u>: Please respond to each item by circling the choice that best answers the question. Respond to <u>all</u> questions. Thank you.

1. **What is the approximate enrollment in your district?**

   a. less than 50
   b. 51-100
   c. 100-299
   d. 300-499
   e. 500-750
   f. 751-999
   g. 1000-1999
   h. 2000-4999
   i. 5000-10,000
   j. more than 10,000

2. **Which of the following best describes your district's location?**

   a. inner city
   b. urban
   c. suburban
   d. rural

3. **Is your school system**

   a. public.
   b. private.

4. **How many years have you served as superintendent in this district?**

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

5. **What is the average number of students per grade in your district?**

   a. 10 or less
   b. 11-25
   c. 26-50
   d. 51-100
   e. 101-149
   f. 150-199
   g. 200-299
   h. 300 or more

6. **How many school buildings in your district?**

   a. 1-2
   b. 3-4
   c. 5-6
   d. 6-10
   e. 11-15
   f. 16-20
   g. 21-30
   h. 31-50
   i. 51-74
   j. 75+

7. **Approximately how many teachers and support personnel (regardless of fractional appointments) are there in your district?**

a. 10 or less
b. 11-25
c. 26-50
d. 51-100
e. 101-149
f. 150-199
g. 200-299
h. 300 or more

8. **Is any building in your district equipped to receive satellite instructional programming?**

a. yes (GO TO item 9)
b. no (GO TO item 10)
c. not sure

9. **What kind of signal is that building equipped to receive?**

a. c-band
b. ku-band
c. both
d. not sure
e. not applicable

10. **Is your district likely to acquire the capability to receive satellite instructional programming in the next two years?**

a. yes, definitely
b. yes, probably
c. no, not likely
d. not sure
e. not applicable

STUDENT INSTRUCTION

Based on the needs of your district, which of the following areas of remedial study would be useful if presented by satellite? (Check all that apply)

	Subject	Grade level
11.	Mathematics	______
12.	Writing	______
13.	English (Grammar)	______
14.	English (Vocabulary/Spelling)	______
15.	Reading (Word Recognition)	______
16.	Reading (Comprehension)	______

17. Other, please specify ________________________________

____

____

Listed below are courses currently or soon to be offered for credit by satellite by the Midlands Consortium. If you would like more information about any of them, please put a check beside it.

18. ___ Basic English and Reading
19. ___ German I
20. ___ German II
21. ___ Japanese I
22. ___ Russian I
23. ___ Spanish I
24. ___ Spanish II
25. ___ AP American Government
26. ___ Applied Economics
27. ___ AP Physics
28. ___ AP Chemistry
29. ___ AP Calculus
30. ___ Trigonometry

What additional satellite courses for students would you like to see offered? Indicate grade level (e.g. elementary, jr. high, etc.)

31. ______________________________
32. ______________________________
33. ______________________________

STAFF DEVELOPMENT

Based on the needs of your school staff, please suggest specific topics within any of the following areas of staff/professional development which would be useful to you/them if presented by satellite.

34. Classroom Management/Discipline/Behaviors: ______________________________

35. Special Education ______________________________

36. Communication ______________________________

37. Instructional design ______________________________

38. Curriculum development/planning ______________________________

39. Evaluation/testing/grading ______________________________

40. Learning/development ______________________________

41. Personal/professional behavior ______________________________

42. Crisis intervention ______________________________

43. Teaching a particular subject ______________________________

44. Other, please specify ______________________________

Are there specific professional development topics which you as an administrator would find personally useful if presented by satellite? Please identify your interest/needs below.

45. ______________________________

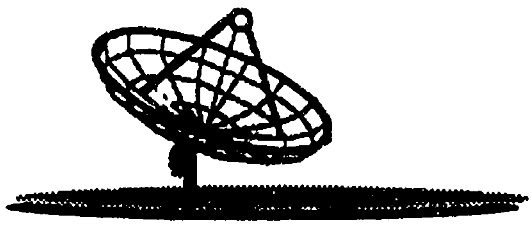
Thank you for your cooperation!

Please use the self addressed stamped envelope and return to:

The Center for Educational Testing & Evaluation
University of Kansas
409 Bailey Hall
Lawrence, Kansas 66045

We want our student courseware and staff development programs to serve YOUR needs. We would greatly appreciate suggestions for courses, short-term instructional events for students, staff development programs or credit courses by satellite for either teachers or administrators. Please feel free to add any comments or suggestions you have.

Midlands Consortium
Research and Evaluation Center



Study of Satellite Programming Needs

Please identify yourself: ______________________
Your school: ______________________
Mailing address: ______________________
____

BACKGROUND INFORMATION

Directions: Please circle the best response (numbers 1-10)

1. **What is the approximate enrollment in your building?**

   a. less than 50
   b. 50-99
   c. 100-199
   d. 200-299
   e. 300-399
   h. 400-599
   i. 600-699
   j. 700-799
   k. 800-999
   l. 1000 or more

2. **Which of the following best describes your school's location?**

   a. inner city
   b. urban
   c. suburban
   d. rural

3. **Is your school**

   a. public
   b. private

4. **How many years have you served as principal in this building?**

   a. 1 year or less
   b. 2-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10-12 years
   f. 13-15 years
   g. more than 15 years

5. Grade levels in <u>your</u> school:

   a. elementary, grades K-6
   b. grades K-8
   c. middle school
   d. junior high school
   e. three-year high school, grades 10-12
   f. four-year high school, grades 9-12
   g. all secondary grades
   h. other, please specify: ______________________

6. **How many teachers and support personnel (regardless of fractional appointments) are there in your building?**

   a. 5 or less
   b. 6-10
   c. 11-20
   d. 21-40
   e. 41-80
   f. 81-100
   g. 101 or more

7. What is the average number of students per grade in your building?

   a. 10 or less
   b. 11-20
   c. 21-40
   d. 41-60
   e. 61-80
   f. 81-100
   g. 101-200
   h. 201-400
   i. 401-600
   j. 601 or more

8. Is your school equipped to receive satellite instructional programming now?

   a. yes (GOTO #9)
   b. no (GOTO #10)

9. What kind of signal is your school equipped to receive?

   a. c-band
   b. ku-band
   c. both
   d. not sure
   e. not applicable

10. Is your school likely to acquire the capability to receive satellite instructional programming in the next two years?

    a. yes
    b. no
    c. not sure
    d. not applicable

Which of the following potential uses for satellite instruction seem appropriate your school? (Check all that apply)

11. Staff and professional development ____
12. Remedial courses in the basic skills ____
13. Advanced/accelerated courses ____
14. Elective courses used to broaden curriculum ____
15. Vocational/occupational courses ____

STUDENT INSTRUCTION

Based on the needs of your school, which of the following areas of remedial study would be useful if presented by satellite? (Check all that apply)

	Subject	Grade level
16.	Mathematics	______________________
17.	Writing	______________________
18.	English (Grammar)	______________________
19.	English (Vocabulary/Spelling)	______________________
20.	Reading (Word Recognition)	______________________
21.	Reading (Comprehension)	______________________
22.	Other, please specify	______________________

Listed below are courses currently or soon to be offered for credit by satellite. If you would like more information about any of them, please put a check beside it.

23. Basic English and Reading ____
24. German I ____
25. German II ____
26. Russian ____
27. Spanish I ____
28. Spanish II ____
29. Japanese I ____
30. AP American Government ____
31. Applied Economics ____
32 AP Physics ____
33. AP Chemistry ____
34. AP Calculus ____
35. Trigonometry ____

What additional satellite courses for students would you like to see offered?

36. ______________________________________
37. ______________________________________
38. ______________________________________

STAFF DEVELOPMENT

Based on the needs of your school, please suggest subtopics within any of the following areas of staff/professional development which would be useful to you if presented by satellite.

39. Classroom Management ______________________
40. Special Education ______________________
41. Communication ______________________
42. Instructional design ______________________
43. Curriculum development ______________________
44. Evaluation/testing/grading ______________________
45. Learning ______________________
46. Personal/professional behavior ______________________
47. Crisis intervention ______________________
48. Teaching a particular subject ______________________
49. Other ______________________

Are there specific professional development topics which you as an administrator would find useful if presented by satellite?

50. ______________________
51. ______________________
52. ______________________

Thank you for your cooperation!
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University of Kansas
409 Bailey Hall
Lawrence, Kansas 66045

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