THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION IN SUPERVISORY COURSES FOR POST-SECONDARY VOCATIONAL AND TECHNICAL STUDENTS AS COMPARED TO CONVENTIONAL CLASSROOM METHODOLOGY

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This is to certify that the

thesis entitled
THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION IN SUPERVISORY COURSES FOR POST-SECONDARY VOCATIONAL AND TECHNICAL STUDENTS AS COMPARED TO CONVENTIONAL CLASS-ROOM METHODOLOGY
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ABSTRACT

THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION IN SUPERVISORY COURSES FOR POST-SECONDARY VOCATIONAL AND TECHNICAL STUDENTS AS COMPARED TO CONVENTIONAL CLASSROOM METHODOLOGY

By

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The Problem

The major purpose of this research was to determine the effectiveness of videotaped instruction in supervisory courses for post-secondary vocational students as compared to conventional methodology in these courses. In order to do this, three hypotheses were tested. They were:

Hypothesis 1:

Students using videotapes in a classroom setting will have higher gains in achievement test scores than will the group receiving the same lessons with conventional instruction.

Hypothesis 2:

Students receiving instructions through videotapes in a small group setting will have higher gains in achievement test scores than will those in a large group receiving the same lessons on videotape.

Hypothesis 3:

There will be no variation in achievement by the type of lesson within the four videotaped lessons.

The secondary purpose was to survey government institutions, business, and schools to determine the extent of their use of television and videotapes.

Design and Procedure

Students from various major fields in the School of Technical and Applied Arts of Ferris State College, Big Rapids, Michigan, enrolled in the Foremanship course during the fall and winter quarters of the 1971-72 school year. This class normally meets on Monday, Wednesday, and Friday or thirty sessions during each ten-week quarter.

Each class was divided into groups for the Wednesday lesson during eight of the ten weeks. One group did not view any videotapes, one group viewed videotapes for four of the lessons in the regular classroom, and one group was divided into sections of two and three students for the four lessons.

The division was made for comparison purposes for four lessons that did not involve videotapes. These lessons were: Communication, Job Analysis, Labor Laws, and Automation. The four lessons which were videotaped

included: Training, Five Minute "How to . . . " Talks, Social Security, and Introduction to Critical Path Techniques (PERT).

Ten question quizzes were developed for each of the lessons and these were used as a pretest on Monday, a posttest on Friday, and as part of the final exam during the last week.

Two Adult Education classes took part in this study during the winter quarter. One received the conventional instruction and the other viewed videotapes in the classroom. The results were not considered significant because of the absences and the data have been placed in the Appendices.

Students were given questionnaires in which they were asked to rate the eight lessons on interest, presentation, knowledge gained, and overall effectiveness. The groups that viewed the videotapes were asked to rate the effectiveness of its use.

A survey was sent to government institutions, businesses, and schools. This was done to determine the extent of the use of television and locate reports on the use of television.

Findings

Two gain scores were calculated for use in this study. They were the post gain score or the difference between the pretest and the posttest, and the final gain

score of the difference between the final score and the pretest. These scores were analyzed using a multivariate analysis of variance to determine if any of the interactions were significant. The items analyzed included the different terms, the different groups, the lessons, the measures, and the unit lessons. The interactions involving the lessons were the only ones found to be significant.

The comparison of the overall mean gain scores indicated that the group which had videotapes in the classroom had the largest gain, the group that did not view any videotapes had the second largest gain, and the group that viewed videotapes in small sections had the lowest gain.

There was no pattern that could be determined when comparing the ratings of the individual lessons or the gain scores on the lessons with the gain scores of the total lessons.

The ratings concerning the use of television were inconclusive but all groups said that the amount of television used in the course was about right. This was in four of the twenty-three lessons.

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By

Elmer Stanley Junker

A THESIS

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DEDICATION

This book is dedicated mainly to my wife, whom I was fortunate to marry when I was a senior in college, who has put up with me for nearly twenty-six years while I worked at various positions and continued to work for advanced degrees, and who has made many sacrifices to help me finish this dissertation and this degree. It is also dedicated to my six children, Kathy, Peter, Dorothy Jean, Sally, Allen, and Gloria, who know what it means to have a father who is a part-time student, and have made many sacrifices, known and unknown; to my mother who started me on the road to my first degree; and to my mother-in-law.

ACKNOWLEDGMENTS

The researcher wishes to acknowledge all of those who assisted in the development and completion of this project. Special recognition is due the guidance committee including: Dr. Peter Haines, Chairman, for his help over the many hurdles; Dr. Rex Ray, who served as temporary chairman during Dr. Haines' sabbatical; Dr. J. Geoffrey Moore, for his wise counsel; Dr. Rollin Simonds, for his advice in the business areas; and, Dr. James Page, for his assistance in the audiovisual field.

Mary Kennedy, of the Office of Research Consultation, is gratefully acknowledged for her assistance in the design of the study, for her work in obtaining the statistics, and for help in understanding the results. Mrs. Virginia Wiseman deserves recognition for her help through all the mazes.

Recognition is also due to my colleagues at Ferris State College. This includes Ken McManis, Sidney Sytsma, Dr. Sanford Halperin, Dr. Allan Goodwin, members of the administration who permitted the experiment, members of the library staff who helped obtain documents,

members of the audi-visual staff who provided valuable service, and most importantly the students who participated in the experiments.

Recognition and gratitude should be afforded to the persons who helped in the typing including two of my daughters, Dorothy Jean Rogers and Sally Junker, and Sherry Novak, Rita Walsh, and Marty North.

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CHAPTER I

THE PROBLEM

The growth of public television in this country has been remarkable. From a novelty at the neighborhood tavern in the forties, it has grown into a respectable family entertainment center in the seventies. Accompanying the growth in entertainment use has been a somewhat slower growth as a classroom device. The use of educational television has been well publicized, with numerous reports written about it, yet; it is not used as extensively as it might be if its instructional effectiveness could be documented. The utilization of television in vocational education has grown even slower than in academic education. This dissertation centered on its use in the area of post-secondary vocational education.

Background and Need for the Study

Television has been used in technical education in some fashion almost from the first time it was introduced to the public. This investigator took part

in experiments involving the teaching of electronic circuits on closed circuit television in the United States Army Signal School at Fort Monmouth in 1952. The military continued its experiments in a section different from that in which the author taught. The school decided that the use of television was feasible, and by 1955, they had six channels operating through the use of coaxial cable. Most of the channels were used for showing motion pictures in the classrooms saving instructor time and equipment operator time. The class did not have to leave the classroom and no audiovisual personnel had to set up and operate the equipment. The schedule of movies to be shown was distributed to all interested personnel. Live television was used to bring maneuver areas into the Officers' School's classrooms.

An article in Business Screen[1] tells of the progress made at Fort Monmouth by 1972. Twenty-three channels were in use with viewing possible in 500 classrooms and conference rooms, in day rooms, in recreation areas, and theaters with large screen projectors. A survey of programs on Monday, March 6, 1972, listed sixty-four 16mm movies, twenty-one videotapes, fourteen kinescopes, and one live newscast.

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[1] "Training at Fort Monmouth," Business Screen, May/June, 1972, p. 24.

This example was not typical of the growth of television in technical education or the academic world generally. Extensive use of television has often not been made unless developmental monies have been provided by a governmental agency or a fund. Ferris State College, Big Rapids, Michigan, which provides both academic and vocational education, reflects the general history. Television equipment was made available in 1965 in order to enable the instructors to gain experience in the use of equipment. In spite of awards given for the use of media in teaching, the use of the equipment did not increase rapidly. An audiovisual center with broadcast color television capability has been built and equipped and the use of television in instruction has increased somewhat. Cables are being run to other instructional buildings which should further increase the use of television.

In an attempt to find research in the vocational and technical areas, especially in the supervisory field, a study was requested for University Microfilm to search for dissertations using the following key words: Foreman, Foremanship, Supervision, Management, Vocational, Business, Distribution, along with Videotapes, Videotaped, Television, TV, Training, and Teaching. A printout of 286 titles of reports written before 1969 was

produced. Only three pertained to the use of television in areas that could be considered vocational or technical education.

Holmes,[2] in his dissertation on television research, listed eighty-three reports for the period of 1954-1959 which were correlated in his study. Of these, ten related to military programs and two others might be considered vocational or technical. None of these pertained to supervisory training.

The lack of many formal research reports in the vocational and technical area, especially as related to supervisory training indicates the need for a study of this type.

Statement of the Problem

The major purpose of this research was to determine the effectiveness of videotaped instruction in supervisory courses for post-secondary vocational students as compared to conventional classroom methodology in these courses. The hypotheses to be treated were:

Hypothesis 1:

> Students using videotapes in a classroom setting will have higher gains in achievement test scores than will the group receiving the same lessons with conventional instruction.

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[2]Presley D. Holmes, Jr., "Television Research in the Teaching-Learning Process" (unpublished Ph.D. dissertation, Wayne State University, 1959), pp. 135-41.

Hypothesis 2:

Students receiving instructions through videotapes in a small group setting will have higher gains in achievement test scores than will those in a large group receiving the same lessons on videotapes.

Hypothesis 3:

There will be no variation in achievement by the type of lesson within the total four television lessons.

These questions are restated in the null form in Chapter III for the purpose of the design of study and data analysis.

The study also was designed to test the student opinion regarding the effectiveness of videotape lessons on factors such as: interest, presentation, and knowledge.

The secondary purpose was to survey government, business, and schools and determine the extent of their use of television and videotape.

Assumptions

All the students enrolled in the investigator's sophomore-level classes at Ferris State College during the two quarters under test (Fall and Winter 1971-1972) were the subjects of the study. Assignments to subgroups were determined by which students had free periods when the equipment was available. The assumption that was made that the use of pretests and posttests would isolate any difference in backgrounds and partially overcome any possible lack of random selection.

Another assumption that was made was that since the instructor and lesson plans would be the same for all sections of the classes, any difference would be as result of the treatments.

It is also assumed that measurement of student achievement by achievement test scores is a valid measure of teaching effectiveness because course grades are determined on that basis.

Definitions[3]

Audio-visual.--Concerning both hearing and vision.

Cable television.--Use of cable systems licensed by the FCC.

Closed circuit television (CCTV).--Transmission of television not available to the general public.

Educational television.--Any television programming with educational intent.

Instructional television (ITV).--Any audio-motion-visual system used primarily for formal instruction.

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[3]Based primarily on Rudy Bretz, A Taxonomy of Communication Media (Englewood Cliffs, N.J.: Educational Technology Publications, 1971), pp. xiii-xxiv, and "Instructional Technology Subject Matter Descriptors: A Subset of the ERIC Thesaurus" (Stanford, Calif.: ERIC Clearinghouse on Media and Technology, 1971).

Open circuit television.--Receiving equipment and programs are available to the general public.

Videotape.--Thin tape coated with magnetic material used to record, store, and playback video and audio information.

Videotape cassettes.--Videotape used in a cartridge rather than reel-to-reel.

Delimitations

The sample was composed of all the students who enrolled in the author's Foremanship courses in the Fall and Winter quarters of the 1971-1972 school year and the results are limited to students in similar situations. This course was a required course for nine major fields in the School of Technical and Applied Arts of Ferris State College and was an elective for the rest of the fields. These students were generally in two-year programs that led to Associate of Arts degrees.

Limitations

Students receiving one treatment were not completely independent of those receiving other treatments because those in the same major field generally were enrolled in lecture and laboratory courses in their major and had some opportunity to interact about the Foremanship course.

Students could not be assigned to the classes on a random basis as they were assigned by block scheduling in their major fields. The use of gain scores partially compensates for this possible nonrandomness.

Overview

Chapter II contains a review of literature which consists of general studies in the use of educational television and particular studies related to this experiment.

The methods of setting up the groups, the treatments used, the tests given, the questionnaires completed, and the statistics used in interpreting the results will be found in Chapter III.

A survey of the users of television in government institutions, colleges, universities, and industrial firms is included in Chapter IV as Part I.

Part II of Chapter IV consists of an analysis of the gains between the pretest and the posttest and between the pretest and the final test and relating these to the hypotheses stated in null form.

The summary, conclusions, and recommendations will be found in Chapter V.

CHAPTER II

REVIEW OF LITERATURE

Overview

The use and accomplishments of educational television have been subject of many studies and reports. Some of the general ones are reported here as are those relating to training in specific areas, especially those dealing with vocational and technical matters.

General Studies

Perhaps the most critical of the studies of Educational Television research was that done by Stickell.[1] He set up vigorous criteria and then proceeded to evaluate research in five areas: the comparability of the control and experimental subjects, the procedures used to assign students to groups, the comparability of the instructors of the various groups, the statistical assumption, and the adequacy of other controls used. He then applied these criteria to 250 comparisons of televised and

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[1]David W. Stickell, "A Critical Review of the Methodology and the Results of Research Comparing Television and Face-to-Face Instruction" (unpublished Ed.D. dissertation, The Pennsylvania State University, 1963), p. 39.

face-to-face instruction and found 10 were interpretable, 23 partially interpretable, and 217 uninterpretable. The ten he felt were interpretable showed no significant difference, 20 of the 23 he felt were partially interpretable showed no significant differences. These 250 comparisons were found in 31 reports in the period of 1955-1960, early in the life of television. It did not include research being conducted at military institutions, one of the heaviest users of the time.

Chu and Schramm took a different approach to the problem.[2] They felt that rather than overlook the studies because they do not meet Stickell's rather rigid requirements for adequate experimental design we should accept them as research findings which may not meet rigorous standards but do provide information on a pertinent research problem. They felt that the schools have done the best they can under the circumstances. Also rigorous studies and nonrigorous studies have tended to get the same results.

In an earlier study, Schramm[3] gave the results of 393 comparisons. Of these 65 per cent showed no

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[2]Goodwin C. Chu and Wilbur Schramm, Learning from Television: What the Research Says (California: Institute for Communication Research, 1967), p. 5.

[3]Wilbur Schramm, "What We Know About Learning from Instructional Television," Educational Television: The Next Ten Years, prepared by the Institute for Communication Research (Stanford, Calif.: Stanford, 1963), p. 53.

significant difference (NSD), 21 per cent favored television, and 14 per cent favored the nontelevision methods. This also showed that television was more effective at the grade school level and less effective at the college level.

Chu and Schramm's 1967 report showed the same trend.[4] Two hundred and seven studies involved 421 comparisons showed the percentage favoring television at the elementary level was greater than that at the college level. They suggested three reasons for this. One was that feedback is lacking in this medium and that because of the complexity, lack of feedback is serious. The second was that younger children have been more exposed to television while growing up than have been college students. And third, it may be that younger students prefer television as a method and older students prefer face-to-face instruction.

There have been various authors who have discussed the NSD of television research. Carpenter[5] in one article said that some of the problems came because television was not developed for educational uses but was adapted for that purpose and felt that in our anxiety to

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[4]Chu and Schramm, op. cit., p. 7.

[5]C. R. Carpenter, "A Perspective of Televised Instruction," in College Teaching by Television, ed. by John C. Adams, C. R. Carpenter, and Dorothy R. Smith (Washington, D.C.: American Council on Education, 1958), p. 15.

teach well we have failed to make students aware of their responsibilities in the learning process. Greenhill[6] felt that if the results indicate NSD, it means that the administrator has alternative methods to use in teaching. Hoban[7] said that we should expect television to be less effective because of the reduction in access to the teacher or in interaction between the student and the teacher. The fact that there is no loss in effectiveness, he considered a significant research finding. The question is not are two things equal or one better than the other, but what is best use of each medium or how can they be combined. Mielke[8] said that if the teachers, instructional content, and students are held constant it may not be right to expect a change in learning from live settings to televised settings. Zigerell talked about criticism of instructional television including that of broadcasters and hostile faculty: "They scoff

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[6]Leslie P. Greenhill, "Review of Trends in Research on Instructional Television and Film," in Research in Instructional Television: Summaries of Studies, ed. by J. Christopher Reid and Donald W. MacLennan (Columbia, Missouri: Missouri University, 1967), p. 4.

[7]Charles F. Hoban, "Hope and Fulfillment in ETV Research," AV Communication Review, Winter, 1958, p. 168.

[8]Keith W. Mielke, "Evaluation of Learning from Televised Instruction," in Instructional Television, ed. by Richard C. Burke (Bloomington, Ind.: Indiana University Press, 1971), p. 103.

at the cult of 'insignificant differences' and insist that if it is to survive in education must teach better than the conventional means."[9]

While Stickell subjected research reports to strict criteria and found that the few that were acceptable generally showed no significant difference, later reporters examining more studies, found that the trend favored the use of television. Even those studies that found no significant difference were felt to show that the administrator and teacher had a choice of methods.

College Television Studies

Rochester Institute of Technology

Richard Zakia[10] wrote a report on the use of television in an engineering course. The cost of a four-credit graduate level engineering course at an off-site industrial center was $11,000. When all costs of production and faculty salaries, and fringe benefits were considered, the cost of the original run plus three re-runs made the first cost $6,400. Generalized results

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[9]James J. Zigerell, "Televised Instruction: Where Do We Go From Here," Educational Technology, September, 1969, p. 75.

[10]Richard Zakia, "Closed Circuit Television at RIT Focuses on Low-Cost Production Without Blurring the Quality," College and University Business, October, 1972, p. 46.

were that the instructors and the students (ninety in three different videotapes courses) were highly favorable toward the use of televised instruction.

University of Maine

In the same magazine there was an article in which Philip Brockway[11] discussed the use of videotapes in placement. One hundred students made 15-minute unrehearsed face-to-face conversations. These were analyzed and then 75 students made tapes. These were sent out 283 times to prospective employees. Thirty-six of the students were placed and most received inquiries.

University of Oklahoma

Perry[12] conducted an experiment using three groupings of students and treatments. Group A had face-to-face instruction by an instructor with professorial rank. Group B had pre-taped lectures with twenty minutes of interaction by special instructor. Group C had the professor using the traditional methods with viewing of videotapes on a selected basis. The

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[11]"Videotaped Interviews Take Students to Business," College and University Business, October, 1972, p. 48.

[12]Billy Lee Perry, "The Effect of Closed Circuit Television on Achievement," Dissertation Abstracts, XXXI (January, 1971), 3,256 A.

highest score was recorded by group B and the difference was significant. However, group A had their lectures in the television studios while the tape was being made. It may be possible that the change in environment and the distraction of the cameras may have reduced the scores of group A.

Chicago City Junior College

Many experiments have been conducted by Chicago City College.[13] A variety of college-level courses was used in this study including English, social science, biology, political science, mathematics, physical science, accounting, shorthand, humanities, psychology, American literature, music, speech, astronomy, business law, and languages. The courses which reported NSD were four English courses, three social science courses, one political science course, one psychology course, one mathematics course, one accounting course, one shorthand course, and one humanities course. Television was favored by four biology courses, one humanity course, one social science course, one mathematics course, and one speech course. Face-to-face instruction was favored in one humanities course. The authors concluded that college could be successfully presented over open-circuit

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[13]Clifford G. Erickson and Hyman M. Chausow, Chicago's TV College: Final Report of a Three Year Experiment (Chicago: Chicago City Junior College, 1960), p. 61.

television without adjustment of the primary objectives or learning materials. Their results would indicate that this type of instruction would succeed with the persons who tune in on televised courses.

Colorado State University

Neidt[14] reported on the use of television in teaching study skills. He had six conclusions: (1) students react favorably, (2) television is effective in the study skills area, (3) lower class students with average or lower achievement reflect the greatest benefit, (4) learning is enhanced when students are given meaningful assignments to perform in classroom following lectures, (5) lessons can be offered successfully throughout the day as well as during the evening hours, and (6) credit is not a necessary condition for successful skills experience. The results were better at the freshman and sophomore level than the junior and senior level. It may be that at the junior and senior level those students who would have benefited have left school.

Oregon State University

The use of cable television is growing throughout the country. With most systems providing a channel or

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[14]U.S., Department of Health, Education, and Welfare, Office of Education, Bureau of Research, Use of Videotaped Instructional Television for Teaching Study Skills in a University Setting, by Charles O. Neidt (Washington, D.C.: Government Printing Office, 1966), p. 52.

more for education we can expect experiments on its use. Such is Johnson's[15] report on Oregon State's presentation of scientific and engineering courses. The school felt that they could save money and classroom space through the use of cable television. The University of Oregon used the television to supplement and enrich live presentations in the classroom. Appendix B[16] of their report listed nineteen uses of cable television.

Colorado State College

McGrath[17] did research with beginning freshmen who were business education and business administration majors at Colorado State College. The research involved 369 students all taught directly or indirectly by McGrath. Two hundred and three watched closed-circuit television (CCTV) in seven rooms. Ninety-six students met in lecture sessions at 9 A.M. and 10 A.M. Five tests were given to these students with one showing a significant difference and this one favored television. This led McGrath to conclude that television would be effective.

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[15]Leland L. Johnson, Cable Television and Higher Education: Two Contrasting Experiences (Santa Monica, Calif.: Rand Corporation, 1971), p. 6.

[16]Ibid., p. 45.

[17]Harold Morris McGrath, "The Effectiveness of Closed-Circuit Television as an Instructional Medium for Lecture Presentation" (unpublished Ed.D. dissertation, Colorado State College, 1964).

Ferris State College

Goodwin[18] used video tapes to help salesmanship students improve their presentations through self-evaluation. Eighty-three students were randomly assigned to four groups. The control group made presentation in private and evaluated their own tapes. Group one had peer participation, instructor evaluation, and self-evaluation. Group two had instructor evaluation and self-evaluation. The presentations were given in private. Group three had peer participation and self-evaluation. As a final test, each student made a presentation selling disability income insurance policies to randomly assigned different types of prospects (five) and different conditions (twenty-one). The group with peer participation but without instructor evaluation was most effective. Based on the results of this study, Goodwin suggested a procedure for skill performance areas. First, place students in groups without instructor to evaluate performance. Second, practice and modify their performances. Third, pick each student's best tape to show to entire class and the instructor. The instructor's comments and suggestions would probably carry the greatest impact for the student at this point.

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[18]Allan Goodwin, "An Experiment in the Use of Video Tape Recordings for Self-Evaluation in Salesmanship Training" (unpublished Ed.D. dissertation, Temple University, 1972), p. 16.

University of Minnesota

A University of Minnesota study concerned the sharing of television among universities.[19] They felt that this approach is feasible and that students accept this, that faculty accept this but want participation in program development, and increasing faculty participation results in a more favorable attitude by faculty. The reasons for using televised instruction are also the reasons for sharing it. This includes: combatting high costs of instruction by extending the influence of good teacher and enriching classroom and out of classroom experiences.

Michigan State University

Davis and Johnson[20] made the study for Michigan State University. Six thousand students were involved in eight different courses. Through use of tests, questionnaires, student interviews, and faculty interviews, evaluation was conducted by a group not connected with the instruction or television production. The grades of students who saw lectures live showed NSD from students

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[19]Minnesota Inter-Institutional Television Feasibility Study, Feasibility Study of Inter-Institutional Television (Minneapolis: University of Minnesota, 1967).

[20]Robert H. Davis and F. Craig Johnson, Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms (East Lansing, Mich.: Educational Development Program, Michigan State University, 1966), p. 31.

who saw the lectures on television. Students who entered CCTV experience with a negative attitude developed a more positive attitude after experience with it. None of the faculty interviewed felt personally threatened by CCTV.

University of Nebraska at Omaha

Grandgenett[21] made a study at the University of Nebraska at Omaha. The purpose was to see if the information supplied by a videotape would affect ratings given to teacher candidates. The variation of ratings among the judges made it impossible to determine the effects of the use of videotapes. The author suggested various methods of redoing the study.

Iowa State University

Charles F. Townsend[22] of Iowa State University sent a copy of a study performed at his school. A course in statistics for engineers which was entitled "Industrial Engineering 362" was picked for the program. On-campus students received their teaching in the television

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[21]Don J. Grandgenett, A Comparison of the Ratings Given Ten Teacher Applicants by Ten Public Administrators after a Traditional Interview and a Video-Tape Teaching Demonstration (Omaha: University of Nebraska at Omaha, 1972).

[22]Iowa State University, "Final Report of Committee to Investigate the Use of Video Tape for Off-Campus Instruction," July 26, 1968.

studios at the same time videotapes were made and shipped to the industrial sites. Forty-six employees of four industries in three towns were involved in the program. One method of providing feedback from the student was to provide a telephone hook-up from the student to the instructor at a pre-scheduled time. Another technique was to begin a new tape by answering questions telephoned or mailed to the instructor after viewing the last program. The number of students at a site ranged from ten to twenty. The on-campus students did not like the situation where the television equipment was located in their midst. The opinion of the off-campus group was favorable ranging from "it's OK" to "excellent." The instructor was generally pleased with the outcome. The results showed the on-campus students doing slightly better than the off-campus students, but the differences were not significant.

University of Akron

An interesting experiment was conducted at the University of Akron.[23] Graduate and undergraduate students were involved in videotaping experiences. A teach-critique-reteach-critique sequence was followed involving the undergraduate student as teacher and the

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[23]Isobel L. Pfeiffer and Rick Reighard, "Micro-Teaching Practicum in Teacher Education," Educational Technology, December, 1971, p. 42.

graduate student in supervision. The critique sessions were also videotaped. The result was experience that was valuable for both the graduate and undergraduate students.

Television, especially with the introduction of videotape equipment, has been used in a variety of areas including engineering courses, academic courses, placement interviews, study skills, business education, salesmanship, and microteaching. These were presented over open-circuit television, CCTV, and cable television. These investigators showed areas in which television could be used successfully.

Faculty and Student Attitudes Toward Television

The effectiveness of televised instruction depends on the reception of student and instructors towards its use. Greenhill had these comments after looking at various studies concerning instructional television: "Negative attitudes of faculty in institutions of higher learning have been the greatest impediment to the use of television, however, students' attitudes have not been a serious barrier to the use of instructional television."[24]

[24]Leslie P. Greenhill, "Review of Trends in Research on Instructional Television and Film," in Research in Instructional Television: Summaries of Studies, ed. by J. Christopher Reid and Donald W. Mac Lennan (Columbia, Missouri: Missouri University, 1967), p. 12.

Student Attitudes

Chu and Schramm summarized research on student attitudes as that students taught by television tend to miss personal teacher-student contact, but there is insufficient evidence to suggest that lack of such contact will impair learning from instructional television (ITV).[25] They felt that students at the college level preferred small discussion classes to televised classes and televised classes to large lecture classes.[26] They suggested that favorable attitudes were distributed widely enough among different televised courses to case doubt on the assumption that some academic subjects may be disliked as material for ITV. Among the factors that determined pupil's attitudes toward ITV were: (a) how much contact they think they will have with a teacher, (b) how they compare the relative abilities of the study and classroom teachers, (c) whether they find ITV boring or interesting, (d) the nature of the televised programs they have seen, and (e) the conditions of viewing.[27]

Greenhill reached this conclusion: "In most cases it would appear that students' attitudes have not been a serious barrier to the use of instructional television."[28]

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[25] Ibid., p. 97.

[26] Ibid., p. 119.

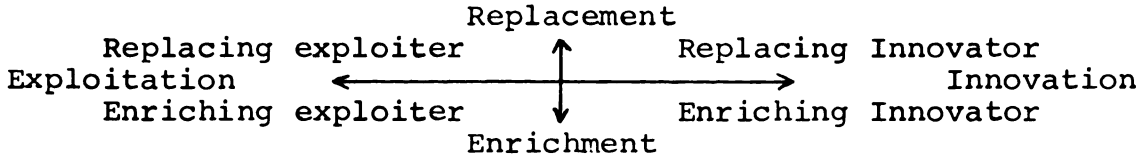
[27] Ibid., p. 127.

[28] Ibid., p. 12.

Tam, Gilman, and Sullins[29] have developed a very good form for measuring student attitudes. They have produced a 38-point Likert-like scale that could be used to produce quantitative findings of student evaluation on the use of television.

Instructor Attitudes

Lee[30] in his book presented an interesting diagram or typology of users of instruction television.



He defined the various terms as follows: the replacing exploiter who uses replacement applications which have the highest pay-off for time and effort involved;[31] replacing innovator who has television as one item in his repertoire of teaching and is not afraid of it;[32]

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[29]Peter T. K. Tam, David A. Gilman, and Walter L. Sullins, Measurement of Attitudes Towards Instructional Television (Terre Haute, Ind.: Indiana State University, 1971).

[30]John A. Lee, Test Pattern (Toronto: University of Toronto Press, 1971), p. 71.

[31]Ibid., p. 72.

[32]Ibid., p. 73.

enriching exploiter who uses television as supplementary or as a frill but rarely even a half a period;[33] and the enriching innovator who is sold on the use of television and makes his course more interesting and attention getting.[34]

Tyler[35] felt that acceptance and productive use of television depends upon a receptive attitude by pupils and teachers alike, especially by teachers since pupils tend to mirror the teacher's reactions.

Bonnie Gilliom[36] listed characteristics which she felt are necessary for success as a television teacher. Included in this list were willingness to learn new skills and a host of traits that would make a person a good teacher in any medium. Neidt and Sjorgren[37] felt that a decline in attitudes toward any course over the period of the course can be expected if only one method of instruction is used. Variation of method is needed. Schramm[38] in an early study of research in instructional television felt that most persons who teach on television

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[33] Ibid., p. 74.

[34] Ibid., p. 75.

[35] I. Keith Tyler, "The Impact of Instructional Television on Teaching Roles and Functions," Communication Review, January-February, 1962, p. 51.

[36] Bonnie Gilliom, "The Television Teacher," in Instructional Television, ed. by Richard C. Burke (Bloomington, Ind.: Indiana University Press, 1971), p. 58.

[37] Ibid.

[38] Ibid., p. 59.

come to like it, while those who do not, tend to be suspicious; and resistance to instructional television tends to center in college. This is concurred in by Greenhill[39] who felt that the greatest impediment to the use of television in institutions of higher learning has been the negative attitudes of the faculty. Chu and Schramm made a few comments on instructor attitudes. They felt that administrators are more likely to be favorable toward instructional television than are teachers.[40] They found five factors that determine a teacher's attitude to television.[41] These were: (a) their perception of the degree of threat to the classroom teacher, (b) their estimate of the likelihood of mechanized instruction replacing direct contact with the students, (c) their estimate of the effectiveness of instructional television, (d) their understanding of the difficulties in using modern techniques, and (e) their conservative nature and trust or distrust of educational experimentation.

Research has shown that the students prefer small group interaction with instructors but this preference has not affected their learning achievement.

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[39] Ibid., p. 16.

[40] Ibid.

[41] Ibid., p. 124.

Some faculty members have feared television but many have learned to make it a useful tool.

Vocational and Technical Instruction

General Vocational Studies

Chu and Schramm had some findings that relate to technical instruction. In a general way they felt that there is no general area where television cannot be used efficiently to teach students.[42] They felt that practice, either by overt or covert response, will improve learning from instructional television if the practice is appropriate to the learning task and is not an interference.[43] Also the use of visual images can facilitate the associate process otherwise they may cause distraction and interfere with learning.[44]

Perlberg[45] made a presentation to the 1968 Illinois Vocational Association Convention based on a paper he authored with others. This was a study on the uses of videotape in Illinois. They found that vocational and technical educators were skeptical of professional

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[42] Ibid., p. 17.

[43] Ibid., p. 101.

[44] Ibid., p. 162.

[45] Ayre Perlberg, et al., "The Use of Portable Video Tape Recorders and Micro-Teaching Techniques to Improve Instruction in Vocational-Technical Programs in Illinois: A Pilot Study" (paper presented at the 1968 Illinois Vocational Association Convention, Chicago, Illinois), p. 2.

education and application in the classrooms but felt that videotape recording and micro-teaching may be more meaningful. Generally, they felt that favorable attitudes to media were increasing.

Schaefer and Strong[46] conducted an experiment in the use of television and reported them in a pamphlet. They felt that their experiments proved that the use of television has very real possibilities for the training of supervisory personnel. This was the opinion of those involved.

Roberts[47] studied the use of audio-visual materials in Detroit industrial concerns and his comments were not favorable. He said there was inadequate budgets, the personnel made little use of existing sources and did not know or use sources of audio-visual equipment.

Simmons[48] made suggestions for use of television in technical schools. These include: videotaped lectures and demonstrations, evaluation of speeches, school

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[46]Carl J. Shaefer and Merle E. Strong, "Using Television for Industrial Supervisory Development," Effectively Speaking (Columbus, Ohio: State Department of Education, 1959), p. 7.

[47]Thomas Wright Roberts, Jr., "A Study of the Use of Audio-Visual Materials in the Training Programs of Selected Business and Industrial Concerns of Metropolitan Detroit," Dissertation Abstracts, XXVI ( ) 2,707 A.

[48]Cecilia M. Simmons, "Tailoring TV to the School-wide Needs of a Technical Institute," School Shop, April, 1968, p. 84.

assembly programs repeated, news bulletins, fire, safety and first aid demonstrations, evaluation of new processes in industry, and building a television library.

The use of the instant replay technique was discussed by McEowen.[49] He took thirty-two students and put them into four groups by random methods and then matched the groups. The method involved the stamping and carving of leather. First, the students viewed a film showing how to use the tools and then they stamped and carved patterns. Group A had a verbal critique from the instructor. Group B watched VTR critique. Group C had verbal critique plus they watched a VTR of their efforts which the instructor critiqued. Group D had a filmed critique, then watched the instructional film, and then they did the exercise again. The results were: audiovisual feedback was superior to videotape alone and repeated use of films. Verbal feedback alone was superior to visual feedback alone. Because of the time required to use the audiovisual method, the author recommended that it only be used with specific skills.

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[49]R. Harold McEowen, "Videotape 'instant replay' Instruction," Industrial Education, October, 1972, p. 66.

Career Education

Robert Hildebrandt[50] talked of the use of videotapes in career education. There are many reasons why students cannot go out into factories. Included are: lack of space for large meetings at the factories, students are too young to enter factories, and transportation that is not always available. Hildebrandt then suggested that occupational representatives be put on tape or that the teacher make the tour and make videotapes and then this could be polished for class presentation. He also gave some good "how to do" information.

Medical Education

Roth[51] of California State College at Los Angeles made a study of the use of television in a college nursing program. This study had to do with improvement of collegiate nursing. In developing this program, a set of criteria was developed which Dr. Roth felt were appropriate and applicable regardless of subject matter or place of instruction. "Television is a two-channel medium and instructionally appropriate when both channels

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[50]Robert Hildebrandt, "Let Video Tape Help You Explore Career Concepts," Industrial Arts and Vocational Education, May/June, 1972, p. 27.

[51]Dorothea H. Roth, Improvement of Collegiate Nursing Education Through the Use of Closed Circuit Television Instruction (Los Angeles: California State College, 1971), p. 1.

are necessary to convey a message."[52] The author felt that the conversion of a lecture to television would fail because it does not present information rapidly.

The experiment was conducted with three graduate classes which were split randomly into two groups. One section viewed a videotape and the other heard the audio portion. Those who listen only would have to be given so much information that it would not be worthwhile to listen.

One videotape had much classifactory material. One group viewed the tape and another read the script. There was no significant difference which would indicate the television alone did not contribute much. The result of this study was the development of programs of television that can be used in training of nurses in clinical instruction.

Craig[53] reported on the use of television in medical education. One effective system is the Medical Television of UCLA. They try to get learner involvement similar to that in the National Driver's Test. In 1971, they had 200,000 viewers at the cost of less than one dollar per viewing.

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[52] Ibid., p. 22.

[53] Robert Craig, "What's New (and Not So New) in Medical Television Education," Educational and Industrial Television, November, 1972, p. 11.

Vocational Agriculture

King[54] felt that television could be used effectively in vocational agriculture. His report dealt with the training programs for salesmen of agricultural products and ideas. Among his conclusions were these: (1) the method works best if programs are telecast on a concentrated basis over a short period, (2) the teachers who are going to use the videotapes should have the scripts one to two weeks prior to telecasts, and (3) before the program begins, there should be a television workshop and in-service training.

British Army

Major Clary[55] made a study of CCTV materials from Britain and the United States. He reduced his studies to four areas: demonstrations, group-paced instruction, simulation, and immediacy.

The first method was group-paced instruction in which the group carried on some operation by following the instructor. This was summarized as follows: learning

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[54]Charles Edward King, "A Case Study of the Evaluation and Use of Special Television Programs as an Instructional Aid in Vocational Agriculture" (unpublished Ed.D. dissertation, Michigan State University, 1955).

[55]D. W. Clary, "Initial Feasibility Trails into the Cost-effective Uses of CCTV in Army Training," in Aspects of Educational Technology, Volume IV, ed. by A. C. Bajpai and J. F. Leedham (London: Pitman Publishing, 1970), p. 161.

from CCTV is at least as good as from a conventional instruction; savings arise by replacing an instructor with a monitor, by replacing an able instructor with a less able one with a monitor, and by standardization of instruction in a shorter time; practical "follow-me" type is good instruction for CCTV; and, principles of programmed learning should be used.

Tests were run on the costs of demonstration use of television. Based on cost, the use of the videotape made a profit on every showing after the fourth. Based solely on total man-hours saved, there was a cumulative saving of man-hours after the second showing.

Tests were run on various methods of simulation.[56] Clary felt that the cost effective applications are similar to those of group-paced instruction and demonstrations provided the materials are selected carefully. They did not have any cost results on the immediacy factor, but opinions were favorable as to its use.

The British Army also made studies comparing the cost of making 16mm films with the cost of making videotapes.[57] Black and white film cost 14,800 pounds per hour as compared with 589 pounds per hour for videotape.

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[56] Ibid., p. 164.

[57] Ibid., p. 165.

United States Army

A prolific writer on the use of various audio-visual devices in the services is Kanner.[58] In an article in 1958, he said that the use of television as an instructional tool was as effective as conventional instruction for a variety of subject matter; motor skills could be taught by television; intensive use eight hours a day for five days a week is possible; and kinescopes can replace or supplement classroom instruction. The schools developed techniques for training television instructors, saved money on training aids, and saved training time.

Ten years later, Kanner[59] had another report on the subject. The army had expanded its training through use of television through additional facilities including those at West Point. Mass television had been replaced by videotape, and instead of the school adapting to television, they are adapting television to their use. Exchanges of tapes between schools are held down by "Educational Nationalism."

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[58]Joseph H. Kanner, "Teaching by Television in the Army--An Overview," AV Communication Review, Winter, 1958, p. 172.

[59]Joseph H. Kanner, "Teaching by Television in the Army--An Overview for 1968," AV Communication Review, Summer, 1968, p. 178.

Television has proven to be a useful tool in vocational and technical education but not too much has been done in research at the doctoral level. Many of the existing studies deal with the use in military training programs.

Research on Techniques of Television in Instruction

Previous research has a bearing on the techniques of instruction to be used in this study and what can be done with the data accumulated in order for the results to be valid.

Chapman and Cariote[60] reviewed the use of television. They said that television was first used for formal instruction in 1953; however, it was first used in general education in 1932 at State University of Iowa. By 1960, half a million students were receiving regular instruction by television. They felt that television will require more first-rate teachers as nothing shows up with greater impact on television than mediocre teachers. They stated: "The consensus of research in the past 15 years indicates that in the case of programmed instructional information, a student responds

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[60]Dave Chapman Inc. Industrial Design, Design for ETV: Planning for Schools with Television, revised by Frank Carioti (New York: Educational Facilities Laboratories, 1968), p. 3.

and retains information presented on television as well as through the medium of traditional classroom presentation."[61]

Bretz[62] listed the following five ways instructional television can be superior to classroom lectures and more effective in producing learning: (1) it provides audio-visual enrichment, (2) because of the large audience expected, more time can be put into preparation, (3) levels of presentation can be raised by only keeping the best teachers, (4) since the lesson becomes public, teachers will work harder, and (5) teachers can be released for important functions.

Wade[63] found that teacher-tell is the least effective method of televised instruction and a method which encourages practice by the learner increases learning especially if feedback of correct response is supplied. Greenhill[64] contributed that the main variable

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[61] Ibid., p. 22.

[62] Rudy Bretz, A Taxonomy of Communication Media (Englewood Cliffs, N.J.: Educational Technology Publications, 1971), p. 48.

[63] Serena E. Wade, The Effect of Different Television Utilization Procedures on Student Learning, Final Report of Santa Clara County Office of Education (Washington, D.C.: Government Printing Office, U.S. Department of Health, Education, and Welfare, Office of Education, 1968), p. 24.

[64] Ibid., p. 3.

in many studies which is televised instruction versus direct instruction is often mixed with other variables such as different teachers and imply that this should be considered. Hoban[65] said that the basic question is not which method is best, but how they can be combined to produce optimum results.

Thorman and Amb[66] compared methods at two schools. The videotape discussion method was used at North Dakota State University (NDSU) in Fargo, North Dakota and the lecture discussion method was used at Moorhead State College (MSC) at Moorhead, Minnesota. The two schools were five miles apart and drew from the same population. The students were not randomly assigned, but the authors felt that the groups had similar characteristics. The NDSU group had videotape recordings (VTR) every week for two of the three periods. Otherwise, the books and instructional materials were the same. The results favored the group that used VTR. The authors felt that videotape is effective in presenting both the instructor and his material and in preserving a positive attitude on the part of students. This small sample follows the pattern of other research they

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[65] Ibid., p. 169.

[66] Joseph Thorman and Thomas Amb, "Videotape/Discussion--Lecture/Discussion: A Comparison," Educational and Industrial Television, November, 1972.

have done. However, it does not say if the same teacher taught both classes, but implies they are different.

Copeland[67] studied different techniques in the use of television. His four techniques were: (a) no talk back during television and no questions permitted, (b) the leader of the group could answer questions, (c) the students had two-way communication to the instructor, but no leader in class, and (d) the students had two-way communication to the instructor and the class had a leader. His results showed no significant difference among the groups which would indicate anyone of the methods would be feasible. The difference between the schools involved made further analysis difficult.

Burnham[68] made a study of students in business education classes who viewed the course at home and at viewing centers. The results of this study involving 263 students showed NSD. The female groups were higher than the male group. He felt that upper-level students could handle the single-exposure, fixed-pace, no-review type presentation inherent in instruction broadcasts.

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[67]Jimmy Bryant Copeland, "An Investigation of Four Television Feedback Techniques Via a Closed-Circuit System," Dissertation Abstracts, XXVII (1966), 533 A.

[68]Kent Richard Burnham, "The Effectiveness of Learning by Instructional Television in Community Viewing Centers and in the Home Environment," Dissertation Abstracts, XXXII (November, 1971), 2,565 A.

Onah[69] performed a related study in the use of audio-visual tutorial (AVT) systems. One hundred and six students started the course in Principles of Accounting with sixty-two finishing. The experimental group used tapes and slides at carrels. His results indicated NSD between the experimental and control groups. He felt that AVT was as effective as the conventional system and the students, in general, liked the system. The results may not be accurate because of the high rate of drop-outs.

Chu and Schramm had various conclusions that would apply. Test results comparing televised instruction and face-to-face instruction are valid if certain conditions are met.[70] They included random assignment of students, same content of lectures, and same learning environments. Also, television is most effective as a tool for learning with learning activities at the receiving end.[71] Students will learn better when visuals are presented in an order carefully planned by production people and the teacher.[72] Problem solving instruction on television is more effective than

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[69]Julius O. Onah, "An Experimental Study Using the Audio-Visual Tutorial System to Teach Principles of Accounting 1 to Community College Students" (unpublished Ph.D. dissertation, Michigan State University, 1971).

[70]Ibid., p. 8.

[71]Ibid., p. 23.

[72]Ibid., p. 48.

lecturing.[73] The students are likely to acquire the same amount of learning whether the materials are presented as a lecture, in an interview, or in a panel discussion.[74] Instructional television appears to be equally effective with small and large viewing groups.[75] Liking television is not always correlated with learning from it.[76] Allen[77] said that we must direct research to the problem of putting together optimum instructional systems for meeting different objectives.

Summary

Historically, research on the use of television in education began shortly after television became popular. Stickell felt that the research done was not rigorous enough and those studies that were interpretable or partially significant showed no significant difference. Other authors differed on the standards needed and whether or not a NSD result still has meaning. They felt that the volume of studies coming after Stickell completed his research have indicated that television is a useful tool for teachers.

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[73] Ibid., p. 66.

[74] Ibid., p. 67.

[75] Ibid., p. 75.

[76] Ibid., p. 133.

[77] William H. Allen, "Instructional Media Research: Past, Present, and Future," AV Communication Review, Spring, 1971, p. 15.

Studies have been done at the college level on a variety of courses, on campus or off, using various techniques and facilities. The results have led the investigators to conclude that television has a place in college-level academic courses.

Research in the vocational and technical area is plentiful if you examine various pamphlets and magazines, but scarce in the area of doctoral studies. The organizations that have done the studies have concluded that there is value in the use of television and have continued to do so.

The attitudes of students have varied, but, generally they favored in person teaching, but the preference has not seemed to affect their achievement. Instructors have been fearful of television but those who try it become consistent users.

Some work has been done to examine the studies done to see if the usefulness of television will vary with the content, the methodology, and the type of students. Much needs to be done in this area.

CHAPTER III

DESIGN AND PROCEDURE

Design

The design of this study is a variation of Design Ten of Campell and Stanley.[1] Their design ten may be shown as follows:

O O	O represents observations
O X O	O represents the treatment

This indicates that the first group had the pretest and the posttest and conventional treatment. The second group had the same pretests and posttests but had a different treatment, the one under study.

The variation of the design used in this study may be shown as follows:

	ODD LESSONS	EVEN LESSONS
Groups 1, 4	O_1 X_1 O_1 O_1	O_2 X_4 O_2 O_2
Groups 2, 5	O_1 X_2 O_1 O_1	O_2 X_5 O_2 O_2
Groups 2, 6	O_1 X_3 O_1 O_1	O_2 X_6 O_2 O_2

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[1] Donald T. Campell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand, McNally and Company, 1966), p. 47.

Groups 1, 2, 3 met in the fall quarter. Groups 4, 5, 6 met in the winter quarter.

No television was used during the odd-numbered lessons so the symbols X_1, X_2, and X_3 represent the different physical arrangement, but with no difference in treatment. This was done for comparison purposes.

X_4 represents the conventional treatment. X_5 represents the treatment using classroom videotapes. X_6 represents the treatment where small groups viewed videotapes.

The numbers of students involved in this study were forty-four in the fall quarter, thirty-seven in the winter quarter, forty-four in adult education. The students in the fall quarter were subdivided into the following subgroups:

(1) Fifteen in the group that received no videotapes;

(2) Fifteen in the group that had videotapes in the regular classroom; and

(3) Fourteen that viewed the videotapes in five small groups.

The winter breakdown was as follows:

(1) Twelve in the conventional classes;

(2) Twelve in the classroom videotape group; and

(3) Thirteen in the five small groups.

The totals for the regular students were as follows:

(1) Twenty-seven in the conventional groups;

(2) Twenty-seven in the classroom videotape groups; and

(3) Twenty-seven in the ten small groups.

The actual number of scores used was less in each group due to student absences.

Population

This study was concerned with the regular daytime students of the School of Technical and Applied Arts.

At the time this study began, 9,161 students were enrolled in Ferris State College, with about 96 per cent being Michigan residents. Two-thirds of these students were in associate degree or certificate programs, usually two years or less. One thousand, eight hundred and twenty-six students were enrolled in major fields of the School of Technical and Applied Arts. Most of these students were male.

Tests were given to all freshmen who enrolled including: School and College Ability Test (SCAT), Cooperative Mathematics Tests (Arithmetic and Algebra I), and Strong Vocational Interest Blank (SVIB). These tests are not used as entrance tests, but serve to help students and advisors in program planning. Ferris State College entering freshmen generally score on an ability

level between the nation-wide sample of all high school graduates and students enrolling in four-year colleges based on their scores on SCAT. Students entering Ferris for baccalaureate programs average higher scores than those who enter for two-year programs. Technical students generally scored higher in the Mathematics section of SCAT than other students.

Each major field includes a program of related academic courses which are conducted by members of the Specialized Education Division of the School of General Education. One of these, Foremanship,[2] is a required course for the following major fields: Auto Body, Auto Machine, Auto Service, Avionics, General Printing, Heavy Equipment Service, Machine Tool, Radio-Television Service, and Welding.[3] Foremanship is strongly recommended by

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[2]The catalog description was as follows:

> G-130. Foremanship Training. Three hours a week. This course is intended to teach the Trade and Industrial students the duties and responsibilities of foremen and the techniques which successful foremen use. The student learns what the typical foreman does, what problems he is confronted with and how he handles them so as to accomplish the task of getting the work out. He learns why the human-relations aspect of the foreman's job is so important. The students are given an opportunity to acquire some foremanship skills through the technique of "role-playing." (Ferris State College, School Bulletin, 1972-1973 [Big Rapids, June 1972], p. 457).

[3]Ibid., pp. 291-309.

the advisors as an elective in the other fields at Ferris. Therefore, all Foremanship classes include students from a variety of fields. These students are usually in the third to sixth terms of their program of studies.

The sample in the study consisted of all of the students who enrolled in Foremanship classes taught by the author in the fall and winter quarters of the 1971-1972 school year. The students in these classes were typical of those who usually take the course, and therefore, the results could be generalized for students of the School of Technical and Applied Arts. Results could also be generalized to students with similar backgrounds in technical institutions other than Ferris.

Procedures for Acquiring Data

Instructional Setting

The Foremanship class normally meets three times a week or thirty times during the ten-week quarter. Classes are fifty minutes in length. The topics given on eight consecutive Wednesdays were used in this study. They were presented in the following order: (1) Communication, (2) Training, (3) Job Analysis, (4) Five Minute "How to . . . " Talks, (5) Labor Laws, (6) Social Security, (7) Automation, and (8) Introduction to Critical Path Techniques. No videotape was used during the odd

numbered lessons. Some groups received the videotape treatment during the even-numbered lessons. The schedule is Appendix A.

For purposes of varying treatment, each group was divided into seven subgroups. The first large subgroup received no videotape. The second large subgroup viewed videotapes in their regular classroom. The other five subgroups consisted of two or three students in a relaxed, informal atmosphere with the instructor involved to the extent of starting and stopping the tape. This arrangement was used for the eight lessons under test. The class was combined for the remainder of the lessons. This meant that each class was together for the first and last weeks of the course and for the Monday and Friday of each of the middle eight weeks. This was done for two quarters to insure sufficient number of subjects. A discussion of the even-numbered or videotaped lessons will follow.

Content of Even-Numbered Lessons

Lesson Number Two--Training.--This videotape was primarily a lecture using a wide variety of training aids to illustrate the lecture and demonstrate their use. Topics included were methods of instruction, materials, training aids, and sources of information to be used by a foreman in conducting training.

Lesson Number Four--Five Minute "How to . . . " Talks.--The purpose of this lesson was to simulate the type of talks a foreman would give in carrying out his training responsibility. The students were taught how to evaluate talks and were given experience in making talks. The lesson began with an explanation by the author of the rating forms to be used and points to be observed during the talks. This was followed by a number of five-minute talks given by students. The groups receiving the conventional instruction had this done live in the classroom, the others viewed videotapes. Because the content of the student talks varied from group to group, the tests in this unit evaluated the use of rating forms.

Lesson Number Six--Social Security.--The Assistant Director of the Regional Office of Social Security made a presentation. This was followed by a question-and-answer session with a panel of students. The program was put on videotape. The author made the presentation in the conventional groups using the notes of the Assistant Director and incorporated the students' questions and the Assistant Director's answers.

Lesson Number Eight--Introduction to Critical Path Techniques (PERT).--This was a lecture-demonstration lesson in which the instructor gave some general

information about the system and then worked out a problem. The students followed the program on worksheets. The same lesson plan and materials were used in the classes receiving conventional instruction.

Scheduling of Groups and Lessons

The following table demonstrates the type of scheduling necessary to meet all the groups. Because not enough equipment was available, some groups met on Thursday instead of Wednesday.

Evaluation of Achievement

The author has taught over seventy sections of this course with nearly 2,000 students since coming to Ferris State College in the fall of 1964. A bank of questions has been developed from which the questions used in this study were chosen. Quizzes consisting of ten items were made for each of the eight lessons. This test was given at the end of class on Monday as a pretest, at the beginning of class on Friday as a posttest, and in the last week of the course as part of the final exam. Since these scores have been used as part of the final grade given to the students, they are valid measures of teaching effectiveness. This follows the ideas advanced by Cornfield and Tukey.[4] The quizzes are in Appendix B.

[4] J. Cornfield and J. Tukey, "Average Values of Mean Squares Factorials," Annals of Mathematicsl Statistics, XXVII (1956), 913.

TABLE 3-1.--Scheduling of groups

	Communications	Training	Job Analysis	Five-Minute Talks	Labor Laws	Social Security	Automation	PERT
8 AM Wed	No VTR	No VTR	No VTR	No VTR	No VTR	No VTR	No VTR	No VTR
9 AM Wed	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR
Small Groups								
11 AM Wed	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR
1 PM Wed	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR
8 AM Thurs	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR
9 AM Thurs	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR
11 AM Thurs	No VTR	VTR	No VTR	VTR	No VTR	VTR	No VTR	VTR

Student Questionnaires

A questionnaire was given to all students to determine their opinion of the effectiveness of the instruction in the lessons under test, and the opinion of the effectiveness of videotapes by the groups that viewed it. A copy of the questionnaire is in Appendix C.

Processing the Data

The data used consisted of the change in achievement scores between the pretest and the posttest and between the pretest and the final test for the lessons singly and collectively.

Because of the many possible interactions, a computer program for the multi-variate analysis of variance developed by Jeremy D. Finn was used.[5] Studies were made of all possible interactions caused by the different quarters, different treatments, and different measures used and assignment to different groups.

The use of analysis of variance determined which interactions were significant. The mean of the gain scores in each cell under test was used to determine which cell showed the greatest achievement.

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[5]Jeremy D. Finn, "Multivariance-Univariate and Multivariate Analysis of Variance and Covariance: A Fortran IV Program," Occasional Paper Number 9 (College of Education, Michigan State University, March, 1970). Use of Michigan State University computing facilities was made possible through support, in part, from the National Science Foundation.

Hypotheses

The data assembled and processed were used to test the hypotheses. These stated in a null form are as follows:

Hypothesis 1:

No difference will be found in the gains in achievement test scores between the group receiving videotaped instruction in the classroom and the group receiving the same lessons with conventional instruction.

Hypothesis 2:

No difference will be found in the gain in achievement test scores between the small groups receiving videotaped instruction and the group receiving videotaped instruction in the regular classroom.

Hypothesis 3:

There will be no pattern of relationship between the gains on the four individual videotaped lessons and the total scores for the overall lessons.

Summary

The design of the study was to use a pretest, posttest, and a final test on eight groups of students over eight different lessons. Some of these lessons used videotape to vary the treatment. The purpose was to determine if the differences were significant, and if so, which treatment and which type of lesson is significantly better than the rest. To do this a multivariate analysis of variance was used.

A student questionnaire was used to determine the effectiveness of videotape and the student's attitudes toward its use.

CHAPTER IV

FINDINGS

Part I

This part of the chapter includes the results of questionnaires sent to Federal government agencies, schools, and businesses. The organizations chosen were institutional members of the American Society for Training and Development, American Technical Education Association, and Michigan Business Education Association who were believed to have training groups large enough to support an undertaking using television or videotapes. In addition, questionnaires were sent to technical schools approximately the same size as Ferris State College.

After the letters were sent out, a copy of the membership list of the National Industrial Television Association, dated November, 1971, was sent by one of the correspondents. Sixteen companies, with employees who are members of NITA, did not answer the request for information.

The purposes were to get an indication of the use of the equipment and locate articles describing the use. A copy of the survey is included as Appendix D. A total of 451 questionnaires was mailed. The numerical survey of answers is shown in Table 4-1.

Government Agencies

An unsigned letter was received from the Bureau of Indian Affairs of the Department of the Interior regarding their use of television. The reactions of the students were good, and the faculty, excellent to a course in which 250 people were trained. One-fourth of the course time was spent using television. Video was used to present skits showing management styles and to record and evaluate group dynamics--individually and on a group basis.

Other U.S. government agencies that have some use of television include the Veterans Administration, the Central Intelligence Agency, the Internal Revenue Service, and the Department of Housing and Urban Development.

Technical Schools and Institutions

The four schools that answered in this category either have not used television or videotapes or do not have data available.

TABLE 4-1.--Replies to questionnaires

	Government Agencies	Technical Schools	Colleges and Universities	Business and Industry	Totals
Mailed	27	45	194	185	451
No Answer	20	41	161	150	372
Television Not used or No Information	3	4	14	13	34
Used in Supervision	6	0	12	16	34
Other Uses	2	0	17	12	31

Note: Numbers do not add up because of more than one use.

Colleges and Universities

Most of the schools which answered the survey used television in three related methods. One was in micro-teaching. The prospective teachers prepared a lesson and taught while a tape was being made. This was played back and evaluated. The second method involved role-playing of salesmanship students as customer and salesperson. This was played back and evaluated. Other uses included making videotapes of student performance in various management areas for playback and evaluation. Television was also used for enrichment of courses.

The wide range of possible use was pointed out in a letter from James M. Murdock of the University of Hartford dated February 3, 1972.[1] The use of videotapes at that school ranged from teacher evaluation in the teacher corps program to role playing in business games to teller and officer training for local bank groups.

A variation of micro-teaching was mentioned in a letter from Jim O'Dell, Assistant Dean of Instruction, Tarrant Junior College, Hurst, Texas, dated February 23, 1972. During their regularly scheduled Department Chairman's meeting, they have four to five micro-teaching sessions going on at one time. They used tapes

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[1] On this and succeeding pages in this chapter, reference to the source of data obtained by letter or phone call is shown in the text rather in a footnote.

extensively on their campus and felt that the use of tapes has been well accepted by their staff and students.

In the spring of 1971, the education department of the University of Nebraska at Omaha sent a questionnaire to members of the department about the desirability of having a micro-teaching laboratory. Don J. Grandgenett of that school supplied a copy of the results in a letter dated February 10, 1972. The faculty was in favor of the laboratory and made suggestions as to its use. The laboratory was established as the result of the questionnaire.

Another school that made extensive use of television or videotape was Kilgore College at Kilgore, Texas. This was described in a letter from Gerald W. Pinson. Some of their uses include: videotapes for student use; videotape recorder in the classroom; television studio for more sophisticated recording; retrieval system in the Learning Resource Center; a telebeam for large groups; and a videotape recorder for in-service training. Dr. Pinson wrote, "I feel that there is great value in the use of videotape--if it is used properly. If misused, it can be just as ineffective as any other teaching tool which is used improperly."

Marquette University used television in speech courses and the results were forwarded by Joseph M. Staudacher in a letter dated February, 1972. The study

was conducted in 1967 and involved 7 researchers and 600 students. One-half of the students were in a large auditorium and the other half were in small groups of 24. The students disliked lectures but liked demonstrations of discussion, debate, and parliamentary procedure. The faculty decided that the value of television was excellent if presented in classrooms and not in large halls, and if time was spent in rehearsing and producing the tapes with professional help and good equipment. The value was poor if these criteria were not met as this caused faculty unrest and student disappointment.

Delta College of University Center, Michigan, has transmitted courses over its television station to plants, hospitals, etc. Over a 7-year period, 10,000 to 15,000 persons received training. Favorable comments were received from students and staff as reported in a letter from William J. Ballard, station manager.

The Dow Leadership Conference Center of Hillsdale College, Hillsdale, Michigan, used television in their manager training seminars. The two seminars--Self-Analysis for Managers and Manager Development--are each given five times a year. Self-Analysis for Managers involves a client/consultant situation which is video-taped and played back. Included in Manager Development is a three-minute speech presentation. Normally eighteen to twenty managers attend each seminar. Manager training

sessions for various companies involved the use of videotapes. Most of the conferees felt that the use of television is valuable. This was reported in a letter from John Collins dated February 29, 1972.

Mr. Jacalyn Robinson, AV Coordinator reported in a letter dated February 7, 1972, that the Mid-Management Coordinator at Carl Sandburg College, Galesburg, Illinois, used a portable videotape to record student's "internship" experiences and also for role playing in Supervision classes. The tapes were played back for evaluation.

Business and Industry

Thirty-five companies answered the questionnaire. People in industry have a tendency to try something and continue it if it will work. They will drop the idea if it does not seem to work. So it was with television.

Appliance Companies

General Electric had a management practices course for the first-time manager. An unsigned note from General Electric told that 1,700 people had taken this 44-hour course. The 4 hours of television were rated of high value and among the most useful. This program was discussed in a bulletin of the Bureau of

National Affairs.[2] One activity that made use of videotape was reported. Four-man groups demonstrated their communication skills in interviewing and data-gathering by simulating an exercise which is videotaped. The tape was played back for evaluation. The trainees rotated among positions of interviewer, interviewee, and the observers who commented on the activities. This course was presented at various locations that had the space, five television sets, and other audio-visual equipment.

Reliance Electric Company's interesting program was described by John N. McCormick, Jr., the Assistant Personnel Manager. This is one of the companies that takes part in the Television Training Institute of Television Channel 25, WVIZ, of Cleveland. Participant ratings were included in the letter of February 28, 1972. The ratings on the television sections of the courses were good to excellent. McCormick felt that they would continue to use the satellite training as long as there is a need among management personnel.

James M. Murdock of the University of Hartford forwarded information regarding training conducted when he was the manager of the Education Center of Royal Typewriter. His letter was dated February 3, 1972. They

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[2]The Bureau of National Affairs Inc., "Case Study: Private Sector," Manpower Information Service, March 10, 1971, p. 305.

had started with management conferences and typewriter assembly training in 1959. In 1965, they had added sales training interviewing and role playing.

Jack Kaull of the Hazeltine Company summarized his company's use of videotapes in a letter received in March, 1972. Seventy-five people were trained in a course that used videotapes for one-half of the training time. Videotape included all the lectures and demonstrations, student presentations, and semi-final exams. The final exams were live sales experiences with a real customer in the market-place. The faculty rated the use of videotape excellent and the students rated it good to excellent.

Max Fuller, Director of Field Education, responded for the Maytag Company on March 1, 1972. They have been using videotape equipment in sales and marketing training programs since August of 1968 and found that this made training more meaningful and also provided a very effective method for self-evaluation. One use was role-playing for selling retail or wholesale. It was also used to supplement training such as tape on the co-op advertising program which the trainee may view many times, disassembly of company or competitors' products at national or regional sales meetings, special presentations by key marketing personnel, and a special course in oral communication. They found that, rather than be adversely

affected by the use of television, students look forward to seeing themselves on screen.

Chemical Companies

William R. Risk of Union Carbide in an undated response answered the questionnaire and sent reprints of articles about training that appeared in various publications including Sony's Application Bulletin, Chemical Week, Industry Week, and Business Week.

Union Carbide called the training group the personnel development laboratory. During the training program, new salesmen received courses entitled "Introduction to Carbide," "Communication Skills Development," and "Selling Skills Development I." After one year in the field, the salesmen may come back to take "Selling Skills Development II." Much of these courses consisted of role playing.

"Selling Skills Development II" was part of the series of continuing education programs which were designed to up-grade the men. Management programs and marketing management programs were also part of the series.

These courses which used videotapes and television 30 to 50 per cent of the time were continuously evaluated. Instructors and staff felt that these

courses were valuable and the center has continued to grow. Approximately 400 students took the course each year.

The Dow Chemical Company used videotape programs put on air by Delta College and followed these with discussion groups. Approximately 700 supervisory people at various levels have received the various programs. Material was well received if presented at the proper level but adversely received if "Mickey Mouse" or some specific habit, speech pattern, or mannerism of the speaker was distracting. They also used videotape in recording and playing back various supervisory skills and in teaching correct maintenance and operating procedures. Dow felt that the use of videotape saves training time, gets better understanding, and better involvement of the group as reported in the letter of January 31, 1972, written by M. A. Storr.

Howard A. Hart wrote of the program of ESB Inc. in a note dated January 26, 1972. They used CCTV for a prerecorded welcome for new employees from the president, for training in interviewing, and for messages to employees in areas such as United Fund, Saving Bonds, and Equal Employment. The employees regarded its use as novel and believable.

Insurance Companies

Pat Campbell, manager of programmer training, reported on the use of videotape by the Nationwide Insurance Company. The company purchased several courses and trained 150 persons who were to use the new computer facilities. Ninety per cent of the course time was spent using television. The students felt the use of television was excellent and very effective.

Crum and Forster Insurance Companies have used videotapes in training approximately 100 supervisors over two years of time. George Shusta, Jr., Vice President, Manpower Development of that company, in his letter of June 27, 1972, said that ten hours or 1/3 of the program time was spent in teaching the supervisory skills of employee interviewing and counseling. Students and staff liked the method so that the company planned to expand its use into other areas.

Steel Companies

Michael P. Soltys, Management Development Representative, in his letter of January 28, 1972, discussed the use of videotape at Bethlehem Steel Corporation. Bethlehem's main uses were improving the speech and mannerisms of the salesmen and top executives the interviewing skills of college recruition. They also used video playbacks to improve skills of supervisors in conducting performance appraisals. Another

use was in a business writing seminar which makes use of videotapes. Bethlehem Steel has not conducted any controlled experiments, but the participants have received the use of videotape well.

Dr. Soltys was the author of an article in the Journal of College Placement in which he discussed the use of videotapes.[3] The use of videotapes to record and play back interviews and role-playing may help the student improve his performance in job interviews.

Don Greenwood of U.S. Steel Corporation responded to the questionnaire by a telephone call in which he reported on the use of television. In five years, they have had fifty-five to sixty playbacks. Tapes included those on motivation, steel in the seventies, organization, participative selling, effective writing, and steel making. Programs included tapes, textbooks, and quizzes. Seventy per cent of the participants answered surveys and most responded favorably. Unfavorable responses were due to electronics or the mechanics of the showing.

Can Companies

Another user of television was the American Can Company as reported by P. J. Kirby in a letter dated January 27, 1972. Approximately 400 supervisors were

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[3]Michael P. Soltys, "An Important Adjunct for Counselors--Video-Taped Role Playing," Journal of College Placement (February-March, 1971), 305.

trained in thirty classes primarily in areas of communications, discipline, interviewing, and counseling. The participants in the program identified the video taping as the highlight of the program. Mr. Kirby said, " . . . the kind of behavior-improvements we saw, and the commitment the supervisors evidenced following this training was proof enough to us that it is a very worthwhile technique."

Continental Can Company's use of television was reported by J. J. Pexco, Regional Supervisor of Training and Management Development in a letter dated January 28, 1972. Videotapes have been used in the instructor institute to record and playback, had just been initiated in management training, and had been used in technical training. The results have been excellent both in understanding and relention.

Vehicular Companies

R. R. Miller, Manager of Training Services, reported on the programs in the Goodyear Tire and Rubber Company on February 10, 1972. Approximately one-half dozen videotapes have been used in various training programs for persons from first-line supervisors to plant manager. These are used all over the United States. Feedback from participants indicates that when the information is relevant and deals with their problems,

they are receptive. Where the subject matter is on something that they think they do not, or cannot, control, they are not very interested.

Chrysler's program was described in a letter from George L. Lumsden, Manager of Sales Training, dated February 3, 1972. Among their uses were speech coaching, case study--role playing, monitoring, role playing on the management level, and as a rehearsal medium for 16 mm films. The film cost $100 per running foot compared to $1,000 per running foot for usual motion film production.

Chrysler found videotape useful in making tapes of typical situations. During the discussion parts of the tapes can be replayed. Two thousand retail salesmen received this type of training in the field.

Video tapes in training and as a management communications tool began in 1968 at Deere and Company as reported by D. C. Patterson, Video Coordinator, on February 9, 1972. Various management and technical groups have made use of videotapes. A course which formerly required forty hours of an instructor's time now can be given to six students at a time requiring a student manual, seven hours of video tape, and a part-time instructor. Video tape was used because it conveys a consistent message and does not eat, sleep, nor require expensive travel accommodations. The company felt the

capabilities of videotape are established and is considering new ways to use it.

R. L. Swain of the Ford Motor Company in a letter dated January 26, 1972, sent a brochure describing a training program entitled "Interpersonal Skills Development." Management and consultants identify difficult person-to-person problems, short videotapes are made, workshops are held where searches are made for alternate solutions, solutions are tried out, and then the workshop is evaluated. The brochures related that 1,500 foremen, staff supervisors, and customer relations personnel have taken the course. Evaluation showed the following results: grievances decreased, better relations between foremen and general foremen, fewer meetings of staff supervisors because of better communication, and personnel developed more willingness to listen and work out alternative solutions with peers and subordinates.

As video-cassettes become standardized and more available, we can expect wider use of videotape in industry. Ken Winslow, in his article in Videoplay Magazine, discussed standardization agreed to by Sony, Matsushisita (Panasonic), and the Victor Company of Japan.[4] As an example of the future, he points out

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[4]Ken Winslow, "Theme and Variations on the 3/4 U Format," Videoplay Magazine, October, 1972, p. 10. This is an insert of Educational and Industrial Television, October, 1972, p. 10.

that Sony has delivered between 30,000 and 40,000 machines with Ford's acquisition of 4,000 machines being probably the largest single order in history for any kind of videotape machine. Other companies will follow Ford's example.

Ford's program is discussed further in an article which is written as a dialogue between the Ford Company and the Video Player Magazine.[5] Before installing the system, Ford did two years of research using seventy black and white sets in Lincoln-Mercury district office. Now, 4,100 systems have been purchased for use in the United States and Canada. Thirteen tapes have been prepared for training and thirteen for merchandising. The small dealers without a large inventory of cars can use the videotapes for demonstration. This indicates a growing use that will be made of the new training tool.

Summary

The pattern followed by many industrial firms is to try a new method or new hardware in their training and if it seems to work they will continue to use it; if not, it is discarded. This is done without the

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[5]"The Ford Video Network," Video Player, October, 1972, p. 10.

rigorous, controlled research of a dissertation although they often rely on the advice of persons with a Ph.D. or a Ed.D.

Many reports have been made in the areas of vocational and technical training. Most have not met the standards of a doctor's dissertation much less Stickell's standards, but organizations that made the studies felt that television was worthwhile. Government training groups and industry training groups have felt that expenditure of funds on television groups is well worth the time and money.

Part II

Findings

The first section of this part will deal with a study of the various sources of variation to see what effect the different conditions had on the means of the gain scores. The second section will deal with the data that result from the student opinion survey.

Effects on Achievement

The study design attempted to measure the gain in student achievement and analyze this gain according to the possible sources of interaction. A multivariate analysis of variance was used to check the various interactions. The items considered were the two terms,

three types of groups, the odd and the even lessons, and the measures used.

Variation by Term

The two terms involved in this study were the fall and winter terms of the 1971-72 school year. Different interactions were tested that involved terms. The main effect was tested to see if there was a significant difference between the fall and winter term. With one degree of freedom, the F score was 2.3151 and the P score was .1358 or no significant difference at the .05 level.

TABLE 4-2.--Interactions involving terms

Type	Degrees of Freedom	F	P
Two way (terms X groups)	2	.1759	.8394
Two way (terms X tapes)	1	.3839	.5390
Two way (terms X measures)	1	.5401	.4666
Three way (terms X groups X tapes)	2	1.3570	.2688
Three way (terms X groups X measures)	2	.1536	.8582
Three way (terms X tapes X measures)	1	.0009	.9769
Four way (terms X groups X tapes X measures)	2	.9616	.3908

None of these interactions which involve terms are significant at the .05 level of significance. This means that it made no difference in which term the students took the course.

Variation by Groups

The three groups involved were the one that received conventional instruction in the classroom, the group that had videotapes shown in the classroom, and the group that viewed videotapes in small sections. The main effect was tested to see if there was a significant difference between the three types of groups. With 2 degrees of freedom, the F score was .6981 and the P score was .5034 or no significant difference at the .05 level.

TABLE 4-3.--Interactions involving groups

Type	Degrees of Freedom	F	P
Two way (terms X groups)	2	.1759	.8394
Two way (groups X tapes)	2	3.5279	.0386[a]
Two way (groups X measures)	2	.7083	.4985
Three way (terms X groups X tapes)	2	1.3570	.2688
Three way (groups X tapes) X measures)	2	.1536	.8582
Three way (terms X groups X measures)	2	.6070	.5499
Four way (terms X groups X tapes X measures)	2	.9161	.3908

[a]Results significant at the .05 level will be marked with asterisks.

Only one of the interactions was significant at the .05 level of significance. This was the interaction of

groups and tapes. This means that it makes no difference as to the group the student is in except when tapes are involved.

Variations by Tapes

In this lesson the interactions involving the odd lessons which used no videotapes for any treatments and the even lessons which included videotapes for two of the treatments were considered. The main effect or difference among the odd and even lessons was tested. With one degree of freedom, the F score was 82.3138 and the P score was .0001. This was significant at the .05 level.

TABLE 4-4.--Interactions involving tapes

Type	Degrees of Freedom	F	P
Two way (terms X tapes)	1	.3839	.5390
Two way (groups X tapes)	1	3.5279	.0386*
Two way (tapes X measures)	1	.2705	.6058
Three way (terms X groups X tapes)	2	1.3570	.2688
Three way (terms X tapes X measures)	1	.0009	.9769
Three way (groups X tapes X measures)	2	.6070	.5499
Four way (terms X groups X tapes X measures)	2	.9616	.3908

One of the interactions was significant at the .05 level of significance. This was the two-way interaction between

groups and tapes. This interaction has a bearing on the hypotheses and will be discussed in more detail later.

Variation by Measures

The measures considered in this group of interaction were the difference between the pretest and the posttest and the difference between the pretest and the final test. The difference between the post gain and the final gain was tested. With 1 degree of freedom, the F score was 4.9572. The P score was .0316 with 1 degree of freedom. This was significant at the .05 level.

TABLE 4-5.--Interaction involving measures

Type	Degrees of Freedom	F	P
Two way (terms X measures)	1	.5401	.4666
Two way (groups X measures)	2	.7083	.4985
Two way (tapes X measures)	1	.2705	.6058
Three way (terms X groups X measures)	2	.1536	.8582
Three way (terms X tapes X measures)	1	.0009	.9769
Three way (groups X tapes X measures)	2	.6070	.5499
Four way (terms X groups X tapes X measures)	2	.9616	.3908

None of these interactions were significant at the .05 level of significance.

Variations Involving Individual Lessons

This group of interactions involved the eight lessons or units that are nested in the odd and even lessons. These were previously considered as a group. The main effect considering units within tapes with 6 degrees of freedom was a F statistic of 13.4874 and a P statistic of .0001. This is significant at the .05 level.

TABLE 4-6.--Sources of interactions considering units

	Degrees of Freedom	F	P
Terms X Units: Tape	6	1.2462	.3065
Groups X Units: Tape	6	.6290	.8108
Units: Tapes X Measures	6	2.0114	.0896
Terms X Units: Tape X Measures	6	3.5720	.0071*
Group X Units: Tape X Measures	12	1.2186	.2876
Term X Group X Units: Tape X Measure	12	.6641	.7796
Term X Group X Units: Tape	12	.6004	.8349

This shows that the interactions involving the units are consistent with previous interactions considering the lessons in total.

Overall Gain in Student Achievement

The overall effect of the instruction upon achievement was tested by means of two hypotheses:

Hypothesis 1:

No difference will be found in the gains in achievement test scores between the group receiving videotaped instruction in the classroom and the group receiving the same lessons with conventional instruction.

Hypothesis 2:

No difference will be found in the gain in achievement test scores between the small groups receiving videotaped instruction and the group receiving videotaped instruction in the regular classroom.

TABLE 4-7.--Overall means of groups

	Odd Lessons	Even Lessons
Groups 1 and 4 (no videotapes)	1.46	2.50
Groups 2 and 5 (classroom videotapes)	1.68	2.72
Groups 3 and 6 (small group videotapes)	1.20	2.38

As shown in Table 4-7, the groups that had the classroom videotapes had the highest mean gain scores, the groups that had no videotapes had the second highest mean gain score, and the groups that viewed videotapes as small groups had the lowest score. Therefore, H_1 and H_2 are rejected.

Gain by Lessons

The effect on achievement upon the individual lessons was tested by the hypothesis following:

Hypothesis 3:

There will be no pattern of relationship between the gain on the individual lessons that were videotaped and the total scores for the overall lessons.

TABLE 4-8.--Means of groups by lessons

Groups	No Videotapes				Videotapes Included			
	Communications	Job Analysis	Labor Laws	Automation	Training	Five-Minute Talks	Social Security	PERT
1 and 4	.50	.72	2.19	2.45	.45	1.00	2.79	5.78
2 and 5	.94	1.89	1.36	2.55	1.53	1.58	3.11	4.73
3 and 6	1.33	.97	1.29	1.22	.97	.69	2.31	5.54

There is no pattern so Hypothesis 3 is accepted.

Student Ratings of Videotaped Lessons

The results of the student surveys are presented by lessons. Only the videotaped lessons, or even-numbered lessons, will be discussed. The scale used on this part of the questionnaire was one to five, with one being the highest rating and five being the lowest.

TABLE 4-9.--Lesson number two--training

	Held Interest	Method of Presen-tation	Knowledge Gained	Overall
Overall Mean	2.32	2.54	2.50	2.48
F Statistic	.141	.918	.664	1.370
Significance	.995	.497	.702	.227
Fall				
#1 no TV	2.33	2.42	2.50	2.58
#2 class TV	2.40	2.36	2.27	2.58
#3 small group TV	2.33	2.83	2.73	2.25
Winter				
#4 no TV	2.39	2.62	2.62	2.54
#5 class TV	2.27	2.55	2.64	2.73
#6 small group TV	2.42	2.83	2.58	2.58

Although variations in scores exist, none are significant at the .05 level of significance.

In Table 4-10, only the overall ratings were significant at the .05 level of significance. Each term showed a different pattern, but the highest average rating was given by the group with no videotape. The second highest was given by the group with classroom videotape, and the lowest by the small groups.

The variation in results (Table 4-11) was not significant.

TABLE 4-10.--Lesson number four--five-minute talks

	Interest	Presentation	Knowledge	Overall
Overall Mean	2.58	2.94	2.77	2.84
F Statistic	.541	.954	.720	3.07
Significance	.881	.471	.655	.007*
Fall				
#1	2.91	3.18	2.82	3.87
#2	2.70	3.50	3.20	3.50
#3	2.46	3.00	2.90	2.50
Winter				
#4	2.33	2.58	2.42	2.85
#5	2.89	3.11	2.78	2.73
#6	2.71	2.57	2.57	3.08

TABLE 4-11.--Lesson number six--social security

	Interest	Presentation	Knowledge	Overall
Overall Mean	2.27	2.35	2.37	2.64
F Statistic	1.309	.319	.638	1.44
Significance	.255	.944	.723	.200
Fall				
#1	2.33	2.33	2.33	2.67
#2	2.17	2.08	2.08	2.42
#3	2.00	2.25	2.18	2.55
Winter				
#4	2.54	2.54	2.62	3.35
#5	2.82	2.46	2.73	2.82
#6	2.42	2.33	2.50	3.00

TABLE 4-12.--Lesson number eight--PERT

	Interest	Presentation	Knowledge	Overall
Overall Mean	2.20	2.47	2.37	2.53
F Statistic	.322	1.141	.544	2.952
Significance	.942	.346	.799	.027*
Fall				
#1	2.50	2.42	2.25	-----
#2	2.17	2.08	2.08	2.17
#3	2.09	2.18	2.20	2.67
Winter				
#4	2.00	2.33	2.33	-----
#5	2.40	2.30	2.40	2.18
#6	2.44	2.33	2.89	2.75

Some data are missing because not enough students answered this part. The results were significant where complete. In both the fall and winter, the small group ranked the videotape lessons lowest.

Attitudes of Students Toward Videotapes

The second part of the survey was only answered by students who had television training since it concerned the use of television.[6] The survey will be repeated here with the numbers in parenthesis being the weight assigned to that answer.

[6]The results given here use the word "television" instead of "videotape" because that is the way the questionnaire was worded.

TABLE 4-13.--Student rating of television

	Opinion of Television As Used in the Course	Did Television Help you Learn?	Amount of Television
	A	B	C
Fall			
#2	2.2	2.3	2.1
#3	2.7	1.9	2.0
Winter			
#5	2.2	2.2	2.2
#6	2.8	1.9	1.8
Overall	2.5	2.0	2.0

Column A lists the ratings of the student's opinions of the use of television in the course. A weight of 1 was given to "disliked it," 2 to "indifferent to it," and 3 to "enjoyed it." The small section group gave the highest rating.

Column B shows the results when the students were asked if television helped them learn. A score of 1 meant "much help," 2 meant "helped some," and 3 meant "didn't help much." Again the small section group gave the highest rating.

The students were asked about the amount of television used in the course. Four of the twenty-three lessons were on videotape. A weight of 1 was given to

"too little," 2 to "about right," and 3 to "too much." The scores indicate that all groups thought that the amount was "about right."

Summary

The group with videotape in the classroom had the highest average gain in achievement therefore the first null hypothesis was rejected. This was:

Hypothesis 1:

> No difference will be found in the gains in achievement test scores between the groups receiving videotaped instruction in the classroom and the groups receiving the same instruction with conventional instruction.

The small group section had the lowest average gain scores of all groups. Thereby rejecting the second null hypothesis. This was:

Hypothesis 2:

> No difference will be found in achievement test scores between the small groups receiving videotaped instruction and the groups receiving videotaped instruction in the regular classroom.

There was no pattern among the gain scores for the individual lessons so the following null hypothesis was accepted:

Hypothesis 3:

> There will be no pattern of relationship between the gain on the individual lessons that were videotaped and the total scores for the individual lessons.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The growth of public television in this country has been remarkable, but the use in educational television, especially in the vocational and technical areas, has not kept pace. There are many reports written about the use of television in the vocational and technical training but these have not been of the formal type. There is a lack of reports in the area of supervisory training of vocational and technical personnel.

Problem

The major purpose of this research was to determine the effectiveness of videotaped instruction in supervisory courses for post-secondary vocational students as compared to conventional methodology in these courses. Three hypotheses were tested:

Hypothesis 1:

Students using videotapes in a classroom setting will have higher gains on achievement test scores than will the group receiving the same lessons with conventional instruction.

Hypothesis 2:

Students receiving instruction through videotapes in a small group setting will have higher gains in achievement test scores than will those in a large group receiving the same lessons on videotape.

Hypothesis 3:

There will be no variation in achievement by type of lesson within the total four videotaped lessons.

The secondary purpose was to survey government, business, and industry to determine the extent of their use of television and videotapes.

Design

The design of this study could be considered a variation of Design Ten of Campbell and Stanley as shown on page 42. The same short test was used for the eight lessons in the study as a pretest, posttest, and final exam.

Two groups of regular day-time students were involved, forty-four in the fall quarter and thirty-seven in the winter quarter of the 1971-72 school year. Forty-four students took the course in adult education during the winter quarter; but since their attendance was inconsistent, the results were not significant and are given in Appendix E.

Population

The students taking the course were enrolled in various technical fields of the School of Technical and

Applied Arts of Ferris State College. These students scored between the average of all high school graduates and the average of students enrolled in four-year courses on the School and College Ability Test. The sample included all the students who took the course as a requirement or as an elective during the quarters under study and enrolled in the author's section of the course.

Description of Method

The class normally meets on Monday, Wednesday, and Friday for thirty class sessions in a ten-week quarter. The lessons used for this study were normally given on the second thru ninth Wednesdays.

On Monday, the class met as a group and received the normal lesson and the pretest for the next lesson. On Wednesday, the class was divided into groups for the treatments. On Friday, the class met as a group and had the posttest on Wednesday's lesson and the normal lesson for Friday. During the last week of the quarter, the class received all the tests as a final exam.

The class was split on four Wednesdays into groups such that one class had the conventional instruction, one viewed videotapes in the regular classroom, and the remainder viewed videotapes in five groups of two or three students. The class was split into the same groups for four other lessons but no

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videotape was used during these sessions. This was done for comparison purposes.

Lessons

The four conventional lessons were: Communications, Job Analysis, Labor Laws, and Automation. The videotaped lessons were: Training, Five-Minute "How to . . . " Talks, Social Security, and Introduction to Critical Path Techniques (PERT).

Measures

Short ten-question quizzes were developed from a bank of questions used with previous classes. A quiz was used as a pretest and posttest for each lesson and as part of the final test for each lesson as the eight quizzes were combined as a final exam during the last week of instruction. A post gain score was obtained by subtracting the pretest from the posttest. The final gain score was obtained by subtracting the pretest from the final test. An analysis of variance program was used to determine if any interactions were significant.

Surveys

Two surveys or questionnaires were part of the study. One was given to the students to rate the eight lessons and the use of videotapes. The other survey was sent to various schools, government institutions,

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and businesses to determine the use of television and to locate reports written on its use.

Findings

Variations were considered to see what effects each would have and if the results were significant. These included interactions of terms, groups, tapes, and measures. These sources were considered two at a time, three at a time, and all four at one time.

Variations by Terms

None of the interactions involving terms were significant. This means that it did not make any difference whether the students took the course in the fall or winter quarter.

Variations by Groups

Only one of the interactions involving groups was significant. This was the result of comparing tapes and groups. This meant that it made no difference as to which group the students were assigned. The significant interaction has a bearing on the hypotheses.

Variations by Tapes

Only one of the interactions involving tapes was significant. This was the result of comparing tapes and groups. This meant that any difference that resulted when comparing gain scores was not significant

except when the different groups using the tapes were considered. This has a bearing on the hypotheses.

Variations by Measures

There was a significant difference when considering the overall averages of the post gain and final gain scores. There were no findings of significance for any of the other interactions involving measures so this difference may be due to chance.

Variations Considering Individual Units

Only one result was significant when considering the interactions involving the eight lessons nested in the odd and even lessons. This was the one involving tapes and groups. This means that the interactions among the individual lessons was significant as was the one found considering the lessons as a group.

Overall Means of the Even Lessons

The group that had the highest gain score was the one that had videotapes in the classroom. The next highest group was the one that did not have any videotapes at all. The lowest group was the one that had videotapes in small sections.

Gains on Videotaped Lessons

The group that used videotapes in the classroom was the highest on the training lesson, the five-minute talk lesson, and the Social Security lesson and the lowest on the PERT lesson.

The group that did not have any videotape was the lowest on the training lesson, highest on the PERT lesson, and the middle group on the five-minute talk lesson and the Social Security lesson.

The group that viewed videotapes in small sections was the middle group on the training lesson and the PERT lesson and lowest on the five-minute talk lesson and the Social Security lesson.

Student Ratings of the Videotaped Lessons

There were no ratings concerning the lessons on training and Social Security that indicated a significant difference.

The overall rating on the lesson on five-minute talks was shown to be significant. Each term showed a different pattern but the averages indicated that the no videotape group rated it highest, followed in order by the classroom videotape group and the small section group.

The overall rating on the lesson on PERT was shown to be significant but not enough students in the

no videotape group answered this part of the questionnaire so no data were shown for their group. The small group sections rated this higher than did the classroom videotape group.

Attitudes Toward Videotapes

All the groups that viewed videotapes rated the use between "indifferent to it" and "enjoyed it" with the small group sections giving the highest rating.

All the groups said that the use of television "helped some" with the small group section rating this the highest.

All the groups felt that the amount of television used in the course was "about right." Videotapes were used in four of the twenty-three lessons.

Survey on the Use of Television and Videotapes

The results of the survey indicated that television is used in many ways by schools, government institutions, and businesses. Although they may not have scientific documentation for their beliefs, people in industry who have tried television believe that this is an effective way to conduct training and have continued to use it.

Conclusions and Implications

The results of this study are that the use of videotape in the classroom is an effective way to teach the type of student usually enrolled in the Foremanship course. This was evident in the training and five-minute talk lessons which were primarily lectures accompanied by training aids. The bulk of the course consists of this type of lesson. It was also shown in the Social Security lesson which consisted of a short lecture by a visiting expert followed by a question-and-answer session.

The PERT lesson required that the students follow the instructor in the problem demonstrated. The group that had videotapes in the classroom did the poorest of the three groups. Evidently, the concentration needed was only present when the instructor made a live presentation or when the small groups could interact and answer each other's questions.

This means that the complete Foremanship course could be put on videotapes. The lessons that were primarily lectures could be shown to large groups of students. The lessons requiring more concentration could be put on videotapes to be drawn out from a library by small groups of students.

The use of videotapes would be helpful in solving some of the problems involved in scheduling of this

course. The students have their major labs in the morning and afternoon hours requiring that the related courses such as Foremanship be scheduled early in the day, at noon, or late in the afternoon, often at some distance from the lab classes. Different major labs are held at various times so Foremanship classes are held when sufficient students are available. Through use of closed circuit television, the lessons could be shown several times during the day and viewed by students in the lab areas, lounge areas near the labs, or in the student dorms.

Ferris State College is located in Big Rapids, Michigan, which is in a predominately rural area. Grand Rapids is the nearest city of any size and this is fifty-five miles away. Instructors who want to show their students the actual job situation must arrange for field trips that take the students away from all the classes, not only their major labs. Instead of this, videotapes could be made at the factory site, edited for effectiveness, and then shown in the classroom. This will be even more feasible as the use of video-cassettes become more widespread.

Like many small communities, Big Rapids will soon have a cable television system. This means that once the system is installed in the homes, the public

schools, and the college, the course could be put on the cable for the regular students and adults of the community.

The course could also be put on videotapes that would be kept in the library so that students could study the lessons at night and review what had been taught in the daytime.

A student at Ferris may challenge any course in the catalog and take a proficiency exam. Students with experience in industry could study the lessons which are missing in their background and then take the required test. This would be in keeping with Ferris' philosophy of being a second-chance school and would speed the mature student's progress toward graduation.

The gains in the lessons were relatively small, but this indicates that administrators have an alternate method of instruction. This may not justify the purchase of equipment for one course but more courses could use this medium. Cable systems in many towns have equipment that would be available to educators without the expenditure of money for equipment.

The amount of gain possible would be sufficient to increase the grade of a student in a school that uses only five letter grades as does Ferris.

Recommendations for Future Research

The small section group did better on some of the posttests than the other groups but then they dropped more than the others on the final test. This resulted in a lower score in the overall rating. This indicates that the small group might have learned better but forgot faster. This is an area for further research.

Another area for future research would be to determine if there is a maximum number of lessons that could be videotaped in a course in order not to lose effectiveness. The students in this research felt that four lessons from the course was the right amount.

Research should be done to see if the studies for the group as a whole would be true for each of the major fields such as automotive, air conditioning, printing, television repair, and welding, among others.

The area of Adult Education needs to be researched further. Some method will have to be developed to take in account the absences that usually result during this type of education.

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APPENDICES

APPENDIX A

FOREMANSHIP (G-130)

APPENDIX A

Foremanship (G-130)

Instructor: E. S. Junker, W-109 796-9971, Ext. 261 Text: Bitell--What Every Supervisor Should Know

1/10	Introduction to Course, Foreman's Job	Chap. 1, 8
1/14	Human Relations	2
1/17	Workers Attitude	3, 4, 19
1/19	Communication	5, 6
1/21	Superior and Subordinates	42
1/24	Leadership	7, 9
1/26	Training	13
1/28	TEST NUMBER ONE	
1/31	Manpower Management	10
2/2	Job Analysis	11
2/4	Appraising	12
2/7	Programmed Instruction	
2/9	Five Minute Talks	
2/11	TEST NUMBER TWO	
2/14	Labor Relations	14
2/16	Labor Laws	14
2/18	Giving Orders	16, 17
2/21	Safety	15
2/23	Social Security	
2/25	TEST NUMBER THREE	
2/28	Discipline and Grievances	18, 19
3/1	Automation and Computers	25
3/3	Automation and Computers	25
3/6	Cost Control & Planning	26, 27, 28, 29
3/8	Introduction to Critical Path Techniques	26
3/10	Cost Control	30, 31, 32
3/13	Final Exam Part One	
3/15	Final Exam Part Two	
3/17	Outside Reports	

APPENDIX B

EIGHT QUIZZES

APPENDIX B

Foremanship Test one Name _____

Group _____

_____ 1. The grapevine gets most active usage a) in spite of good communications, b) in the absence of good communications, c) because of malicious employees, d) when the boss is away.

_____ 2. The third dimension in three-dimensional communications is a) across the organization, b) means any three people, c) is the third rank of the organization, d) is the third level down.

_____ 3. The best kind of communications combine spoken or written words with a) movies, b) action, c) television, d) listening.

_____ 4. The most fundamental form of communication is a) planned appointments, b) telephone calls, c) informal talks d) interoffice memo.

_____ 5. The best type of communication for quick checkup a) planned appointments, b) telephone calls, c) informal talks, d) interoffice memo.

_____ 6. A common error in conferences is a) not assemblying data, b) not providing enough time, c) running too long, d) not consulting others when setting up agenda.

_____ 7. Rules of communication include which of the following: a) sell the spirit as well as the message, b) individualize the communications, c) back communications with action, d) all of the above.

_____ 8. Distortion or clogging in communications is caused by a) delay, b) rivalries, c) procrastination, d) all of the above.

_____ 9. Which of the following do not cause rumors? a) wishful thinking, b) uncertainty, c) anger, d) facts.

_____10. The best reason for poeple being poor listeners is a) watching for facial expressions too much, b) too busy trying to express own ideas, c) listening too well, d) hair too long.

APPENDIX P (Continued)

Foremanship Test Two Name _____

I. Match item with definition

_____ 1. Initial training

_____ 2. Upgrading training

_____ 3. Updating training

_____ 4. Refresher training

_____ 5. Retraining

A. Higher level in same family of jobs

B. Teaching a new skill

C. Teaching to person with no previous skill

D. Teaching latest developments

E. Reteaching courses in an area not used

II. Use a for training literature, b for an evaluation device, c for an audio-visual aids, and d for a method of training.

_____ 6. Lecture

_____ 7. Lesson plans

_____ 8. Movies

_____ 9. Performance check lists

_____ 10. Rotation

APPENDIX B (Continued)

Foremanship Test Three Name _____

Use a + if the answer is true and a 0 if the statement is false.

_____ 1. The purpose of job evaluation is to rate the worker.

_____ 2. A job description tells in general terms what a worker does.

_____ 3. A job description is a step by step account of a job.

_____ 4. A red circle rate is a rate above the normal rate.

_____ 5. Cost of living adjustments are not included in take home pay.

_____ 6. Non-exempt workers do not collect overtime.

_____ 7. Job evaluation tells what type of training is necessary.

_____ 8. A point system is one method of job evaluation.

_____ 9. Ranking of jobs does not figure in job evaluation.

_____ 10. The basic tool of job evaluation is merit review.

APPENDIX B (Continued)

Foremanship Test Four Name _____

Match item of rating with a bad example of the rating.

____	1. Facilities	A. Answers questions with new information
____	2. Training Aids	B. Displayed as needed
____	3. Concepts	C. Feels teaching is a chore
____	4. Appearance	D. Follows logical order
____	5. Eye Contact	E. Front of room orderly
____	6. Voice	F. Everything is important
____	7. Attitude	G. Hair not combed
____	8. Knowledge	H. Interested in getting material across
____	9. Subject Matter	I. Lesson all jumbled together
____	10. Question	J. Lights not on when needed
		K. Looks out window
		L. Knows only what he is teaching
		M. Main ideas recognizable
		N. No order to talk
		O. Pictures remain when not needed
		P. Rattles coins
		Q. Talks at one pitch
		R. ASks general question
		S. Varies rate of speech
		T. Looks around room

APPENDIX B (Continued)

Foremanship Test Five Name _____ f71

The following is a list of labor laws. Use the letter of the law to match with an idea from the law. Use one letter in each answer even though more than one law would apply.

A. Sherman Anti-trust Act (1890)
B. Clayton Anti-trust Act (1914)
C. Railway Labor Act (1926)
D. Norris - LaGuardi Act (1932)
E. NIRA (1933)
F. National Labor Relations Act (Wagner Act) (1935)
G. Public Contracts Act (Walsh-Healey Act) (1936)
H. Fair Labor Standards ACt (1938)
I. War Labor Disputes Act (Smith-Connally Act) (1943)
J. Labor-Management Relations Act (Taft-Hartley) (1947)
K. Communist Control Act (1954)
L. Labor Reform Act (Landrum-Griffin) (1959)

_____ 1. Employers could not interfere with unions

_____ 2. Labor is not an article of commerce

_____ 3. Labor's strikes are an restraint of trade

_____ 4. Minnimum wage is set

_____ 5. Overtime must be paid for work over 8 hours in a day

_____ 6. Overtime must be paid for work over 40 hours in a week

_____ 7. Right to work laws permitted

_____ 8. Secondary boycott prohibited

_____ 9. Workers could organize and bargain collectively

_____ 10. Yellow dog contracts unenforceable

APPENDIX B (Continued)

Foremanship Test Six Name _____ f71

I. True or false question. Put check in proper space.

True	False		
____	____	1.	Social security cards should be used for identification.
____	____	2.	Social security checks cannot be garnished.
____	____	3.	Social security checks may not be paid to anyone over 18.
____	____	4.	Social security checks may be mailed to retired person outside the United States.

II. Multiple choice. Put letter in blank.

_____ 5. What is the maximum years of coverage a person needs to become fully covered under social security? a) 10 b) 20 c) 30 d) 40 e) 50

_____ 6. At what age may an employed person who is not disabled retire and receive full benefits? a) 60 b) 62 c) 64 d) 65 e) 70

_____ 7. Which of the following is closest to the maximum amount of salary which is taxed by social security? a) $3,000 b) $5,000 c) $7,000 d) $9,000 e) $11,000

_____ 8. The maximum amount an employed worker should pay in social security taxes in one year is closest to: a) $600 b) $630 c) $660 d) 690 e) $720

_____ 9. The maximum retirement benefit one person may receive is closest to: a) $324 b) $364 c) $404 d) $444 e) $484

_____ 10. The tax rate for social security paid by one employed person is: a) 6.0% b) 5.85% c) 5.2% d) 3.6% e) 2.8%

APPENDIX B (Continued)

Foremanship Test Seven Name _____

Match term with expression or definition

____	1. Job lot	A.	Actually performs operation
____	2. Departmentalized	B.	All work done by individuals
____	3. Progressive	C.	Automatic muscle
____	4. Conveyorized	D.	Compares output with input
____	5. Automation	E.	Continuous flow of mechanized assembly
____	6. Information	F.	Directions for operation of machinery
____	7. Controller	G.	Hand fed machines with parts on conveyors
____	8. Servomechanism	H.	Individuals use machines to help with speciality
____	9. Machine	I.	Regulates the operation
____	10. Feedback	J.	Work by individuals as specialists

Foremanship

latch term

__ 1. Ci

__ 2. A

__ 3. T

__ 4. T

__ 5. T

Given the f
4 days perm

Event
A
B
C
D

__ 6. T

__ 7. T

__ 8. T

__ 9. T

__ 10. T

APPENDIX B (Continued)

Foremanship Test 8 Name _____ f71

Match term with definition.

____	1.	Circle	A. Earliest possible time job could be done
____	2.	Arrow	B. Latest time job is permitted to be done
____	3.	Te	C. Slack time
____	4.	Tl	D. Represents an activity
____	5.	Tl - To	E. Represents an event

Given the following information work the problem and answer the questions.
4 days permitted to complete job.

Event	Preceding events	Activity time
A	None	None
B	A	1
C	A	2
D	B,C	3,1

____ 6. Tl of B is a) 1, b) 2, c) 3, d) 4, e) 5

____ 7. Te of B is a) 1, b) 2, c) 3, d) 4, e) 5

____ 8. Tl of C is a) 1, b) 2, c) 3, d) 4, e) 5

____ 9. Te of C is a) 1, b) 2, c) 3, d) 4, e) 5

____ 10. The critical path is a) A to B to C, b) A to B to D, c) A to C to D
d) D to B to A, e) D to C to A

APPENDIX C

STUDENT SURVEY

APPENDIX C

STUDENT SURVEY

Name _____ Date _____

I. Rate each of the following lessons using a scale of 1, 2, 3, 4, 5
1 will represent the highest level, 3 average, and 5 the lowest.

	Held your Interest	Method of Presentation	Knowledge Gained	Overall
1. Communication _____				
2. Training _____				
3. Job analysis _____				
4. Five minute talks _____				
5. Labor Laws _____				
6. Social Security _____				
7. Automation and Computers				
8. PERT _____				

II. What is your opinion of television as used in this course? (check one)

_____ enjoyed it _____ indifferent to it _____disliked it

III. Did the television used in this course help you learn?

_____ didn't help much _____ helped some _____ much help

IV. What is your opinion regarding the amount of television used in this course?

_____ too much _____about right _____too little

V. Any specific comments on the following lessons; such as value, suggestions for improvement, etc.

A. Training

B. Five minute talks

C. Social Security

D. PERT

APPENDIX D

SURVEY ON USE OF TELEVISION

APPENDIX D

231 Ives Avenue
Big Rapids, MI 49307
January 1972

Dear Sir;

I am an Associate Professor at Ferris State College and also enrolled as a graduate student at Michigan State University.

I am conducting an experiment in the use of videotapes in some of my classes. This research is the main part of my dissertation, tentatively entitled, A Study in the Use of Videotapes in Teaching Supervisory Training Classes in Vocational and Adult Education.

I would like to include in my dissertation a summary of studies that may have been conducted on the use of television or videotapes in similar situations. If you have conducted any courses in supervisory training using television or videotape I would like you to supply the information requested on the attached form.

If you have not done this type of study but someone else has I would appreciate you forwarding the material to him.

Sincerely yours,

Elmer S. Junker

Elmer Junker
Associate Professor

APPENDIX D (Continued)

Survey on the Use of Television or Videotape

Please describe your study, answering the following questions.

1. When was this survey completed?
2. How many people were involved?
3. What part of the course was spent in the use of TV or videotapes?
4. What was your opinion of the value of TV or videotape?
5. What opinions were expressed by the students as to the value of the TV or VTR?
6. Please summarize the experiment.
7. If this experiment was written and published from where may copies be obtained?

Summaries of answers received will be sent to those requesting them.

APPENDIX E

ADULT EDUCATION

APPENDIX E

ADULT EDUCATION

Ferris State College Adult Education programs attract students from cities and towns in a radius of over sixty miles. Included are persons connected with Ferris, employed persons desiring to up-grade themselves, employed persons sent by their companies, owners and managers of small businesses, and housewives.

Three courses in Supervisory Training were offered free during the winter quarter of 1971-1972. Eighteen students signed up to take the course on Tuesday nights, twenty-six on Wednesday nights, and none on Thursday night. The group on Tuesday night received the conventional training and the one on Wednesday night had videotapes in the classroom.

Students who took the classes were from Ferris' nonacademic departments and companies in Big Rapids, Reed City, Cadillac, Newaygo, Fremont, and White Cloud. It cannot be determined if this group was typical of adult education groups.

Schedule

Each group met for two hours a night for ten sessions. Their schedule was as follows:

First Week - Introduction. Supervisor's Job. Human Relations. Workers' Attitude.

Second Week - Superiors and Subordinates, Communication.

Third Week - Leadership Training.

Fourth Week - Programmed Instruction, Manpower Management, Job Analysis.

Fifth Week - Merit Review, Five-Minute Talks

Sixth Week - Labor Relations, Labor Laws.

Seventh Week - Safety, Social Security.

Eighth Week - Discipline, Automation and Computers.

Ninth Week - Planning, PERT.

Tenth Week - Cost Control.

The eight lessons involved in the study were given on the second through ninth nights. The pretest was given at the beginning of the evening and the same test was given as a posttest at the end of the night. The eight tests were combined as a final test during the last night of the course.

Gain Scores

A post gain score was determined by subtracting the pretest from the posttest. A final gain score was obtained by subtracting the pretest from the final test.

TABLE E-1.--Gain scores (adult education)

Group	Training (2)	Five-Minute Talks (4)	Social Security (6)	PERT (8)	Overall
7 (No TV)	1.36	.36	2.96	5.80	2.62
8 (TV)	-.85	1.04	2.58	5.33	2.20

Because of the absences, these scores do not meet the test of significance, however, the group that did not view videotapes generally had the higher score.

Ratings of Lessons

TABLE E-2.--Ratings of videotaped lessons (adult education)

	Held Interest	Method	Knowledge	Over-all
Lesson #2 (all groups)	2.32	2.54	2.50	2.48
Group 7	2.17	2.42	2.25	2.42
Group 8	2.27	2.33	2.40	2.24
Lesson #4 (all groups)	2.58	2.94	2.77	2.48
Group 7	2.27	2.64	2.55	2.00
Group 8	2.50	2.92	2.92	2.36
Lesson #6 (all groups)	2.27	2.35	2.37	2.64
Group 7	1.82	2.55	2.27	2.10
Group 8	2.07	2.27	2.27	2.33
Lesson #8 (all groups)	2.20	2.47	2.37	2.53
Group 7	1.92	2.17	2.08	----
Group 8	2.19	2.94	2.69	2.77

The overall ratings for lesson number four and lesson number eight were the only ones that were significant in the main body of the study. On these two lessons, the group that viewed the videotapes rated the lessons higher than the groups that did not view videotapes.

Rating of the Use of Television

The opinion of the use of television was rated 2.8 by group eight (2 was indifferent to it and 3 was enjoyed it). When asked if television helped them learn the group rated this item 1.7 (1 meant much help and 2 meant helped some). The group was asked about the amount of television in the course and gave a rating of 1.9 (1 meant too little and 2 meant about right).

Conclusion

No significant scores could be determined for this group because of the absence of the students. Using the gain scores, in only one lesson, did the class with videotapes in the classroom do better than the other group. It may be that adults have not grown up with television as have our regular students and have not learned to see it as anything but entertainment.

More research needs to be done with Adult Education students. Some way will have to be found

to either use the data with the absences or keep the students from being absent or enroll large enough groups so that absences will not be a factor.