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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

THE EFFECT OF CLOSED-CIRCUIT TELEVISION ON ACHIEVEMENT

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF EDUCATION

BY

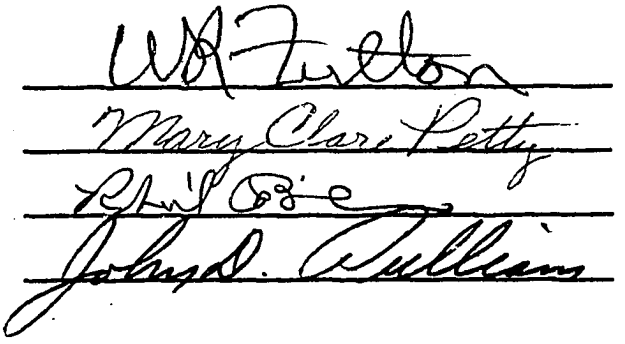
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1970

THE EFFECT OF CLOSED-CIRCUIT TELEVISION ON ACHIEVEMENT

APPROVED BY



DISSERTATION COMMITTEE

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CHAPTER I

THE PROBLEM: ITS BACKGROUND AND SCOPE

Introduction

Instructional television is in its early stage of development. Each year new technological developments open up completely new areas of application. While educators can only speculate, there is no way of foreseeing the ultimate role that instructional television will play in the entire spectrum of education.

Television is a tool, just as motion pictures, radio, charts, maps, books, and laboratory equipment are also tools to be used in education. Teaching by television becomes of interest to an institution only when it can be shown to be a useful and more efficient method for solving critical educational problems than past procedures. Closed-circuit television is the most frequently suggested educational medium for dealing with some of the problems created by rising enrollment.

Alvin C. Eurich,[1] Director of the fund for advancement of education, has pointed out that the evident

[1]Alvin C. Eurich, "A Foundation Looks at College Teaching by Television," The Journal of Educational Sociology (May, 1958), 330.

deterioration of quality of instruction leads one readily to an urgent wish to see that our very best teachers are used more extensively than before in meeting a larger number of students. Since education is basically the transmission of the accumulated knowledge and wisdom of the human race to successive generations, every means of communication must be considered.

There are many courses which could make effective use of television, and it is probable that most courses taught by lecture and demonstration could be taught through television with little loss in student learning.[2] Courses in Education would seem to lend themselves well to this method of instruction.

Students' attitudes toward Closed-Circuit Television tend to be influenced by the interaction of a number of variables. College students in television classes tend to rate courses, instructors and instructional television less favorably than students in conventionally taught classes.[3] Acceptance, also, seems to depend on subject matter and teachers.[4] With experience in viewing television lectures,

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[2]W. J. McKeachie, "TV for College Instruction," The Journal of Educational Sociology, VI (May, 1958), 87.

[3]Miami University, Second Report: Experimental Study in Instructional Procedures (Oxford, Ohio: Miami University, 1957).

[4]C. R. Carpenter and L. P. Greenhill, "An Investigation of Closed Circuit Television for Teaching University Courses," Instructional Television Research Report, No. 2 (University Park: Pennsylvania State University, 1958).

students tend to gain more respect for this method of instruction.[5] The quality of instruction becomes a more important determinant of student attitudes. Attitudes of college students toward television instruction appear to have little or no correlation with achievement.[6]

Proper utilization of instructional television is a matter of human understanding, skill, and motivation. It would seem that television's impact at the grass-roots level of instruction--that is, on the student in the classroom--requires that educational leaders in various educational levels develop flexibility and receptiveness to change.

Education by television cannot come of age until the "frill" or extra-curricular misconception is eliminated by demonstrable results that justify its cost and ensure television's rightful status as a bona fide classroom tool of our times. The team approach is a basic pre-requisite for each program, with the individuals concerned contributing their best talents and skills toward the common goal.

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[5]C. G. Erickson and H. M. Chanson, Chicago's TV College: Final Report of a Three-Year Experiment (Chicago: Chicago City Junior College, 1960).

[6]C. Ray Carpenter and Leslie P. Greenhill, "An Investigation of Closed Circuit Television for Teaching University Courses," Report No. 2: The Academic Years 1955-1956 and 1956-1957 (University Park: Pennsylvania State University, Division of Academic Research and Services, 1958).

The basic question involves the actual worth of closed-circuit television as an effective instrument of instruction. If this device can present information vicariously as effectively as face-to-face instruction presented in a classroom, the belief of proponents in the educational potentiality of television instruction demand consideration. Should this method of instruction prove less effective than traditional methods, no amount of secondary advantages can outweigh this liability. This question must be subjected to the rigorous scrutiny of controlled research methods. If the findings of this study show the methods to be of equal effectiveness, or the experimental method to be more effective than the traditional, there will be secondary questions arise concerning the effectiveness of the methods of utilization which will necessitate further study. The problems will be of little significance if the closed-circuit television instruction, with the aid of special instructors, proves to be less effective than the traditional.

Statement of the Problem

The problem of this study was to ascertain the differences in achievement, relative to the course, Curriculum and Instruction in Secondary Education, taught by closed-circuit television in a large class, taught by occasional viewing of video tape on a selective basis in a large classroom setting, and in comparison with a similar

class taught by face-to-face contact in a television studio while the lesson was being video-taped.

More specifically, the same lesson was taught by face-to-face instruction, video-taped, and beamed to the various other sections at the appropriate times; each of which were presided over by special instructors with twenty minutes of interaction following video-tape presentation. In other words, only a thirty minute lecture via television was presented with the balance being interaction by a special instructor. The third group was taught by an instructor with professorial rank and, on occasions, viewed video-taped presentation on a selective basis. Otherwise, the section was taught in the traditional method of instruction.

The data required in the solution of the problem consisted of a score for each student involved in the course, Education 141, a score on a written pretest and posttest.

In order to facilitate the analysis of data, the following null hypotheses were formulated:

H_{o1} There is no difference in achievement in favor of the face-to-face instruction group over the sections viewing the lecture by video tape and presided over by special instructors and the section taught by an instructor with professorial rank and occasional viewing of video tapes on a selective basis.

H_{o2} There is no difference in achievement in favor of sections viewing the lecture by video tape and presided over by special instructors over the section taught by an instructor with professorial rank and occasional viewing of video tapes on a selective basis.

Limitations of the Study

1. This study was limited to University of Oklahoma students enrolled in the following course during the Spring semester of the school year 1969-70:

Education 141 -- Curriculum and Instruction in Secondary Education.

2. This study was limited to the validity and reliability of instrument designed and used for comparative analysis.

Definition of Terms

Closed-Circuit Television -- A television system which limits distribution of an image to those receivers which are directly connected to the origination point.[7]

Instructional Television -- Any closed-circuit or broadcast television program which provides formal instruction, usually for credit.[8]

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[7]Alphabetical Listing of Terminology, Audio-Visual Communication Review, Vol. II (January-February, 1963).

[8]Ibid.

Television Instruction -- A lesson offered over closed-circuit or broadcast television. Depending upon the individual institution sponsoring the activity, written requirements, reading assignments, and examinations are included.[9]

Tape, Video -- A tape used to record picture and sound from television programs by a magnetic process.[10]

Vicarious Learning -- That learning which is incirect or secondary, not firsthand.[11]

Interaction -- Interaction Variations are those attributable not to either of two influences acting alone but to joint effects of the two acting together.[12]

Instructional Aids -- Devices which assist an instructor in the teaching-learning process by simply presenting supporting or supplementary material, usually intermittently. They are not self-supporting.[13]

Special Instructor -- A doctoral candidate who has completed or is near completion of his course study toward a doctor's degree in Education, and has been elected to teach undergraduate courses in the College of Education.

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[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

Research Design

This study has been designed to compare the effectiveness of three methods of teaching Education 141. The subjects for the study were from the five sections of students who were enrolled in the course, Curriculum and Instruction in Secondary Education during the Spring semester of the school year 1969-70. These students were randomly assigned to each section during the regular enrollment period. Since many students tend to show preferences for instructors and for the time at which courses are offered, randomness of sample with respect to these factors was effected by assigning students to the various sections as they appeared for enrollment.

Approximately equal numbers were maintained in each section throughout each registration day. The randomizing procedure gave each student an equal chance to be included in any one of the sections, regardless of the time at which the student was scheduled to enroll. Though the classes were not "balanced" by having students of exactly the same potential academic ability or exactly the same distribution and academic division, they were similar in most respects.

The three groups were assigned as Groups A, B, and C and were instructed as follows:

Group A: This method was taught by face-to-face contact in a television studio where the lesson was being video taped.

Group B: This method utilized the video-taped lectures which was beamed to the various other sections at appropriate times. Each was presided over by special instructors with twenty minutes of interaction following video-tape presentation.

Group C: This section was taught by an instructor of academic rank with occasional viewing on a selective basis, and otherwise was taught in the traditional method of instruction.

Collection of Data

Two measurements of data were taken on each student included in the study. These were (1) a score on a written pretest, and (2) a score on a posttest.

Pretest.--A pretest was administered to all students prior to the beginning of the first unit of the course. The items for the test were selected from a body of items previously administered to similar groups and analyzed as to level of difficulty, discriminating power, and reliability. These data were analyzed by a one-way analysis of variance. Tests of reliability and validity were computed on the test items. (See Appendix B.)

Posttest.--A posttest which was identical to the pretest was administered at the conclusion of the course.

Statistical Design

The data obtained for this study were given the following statistical treatment: (1) computations were made of the mean, standard deviation, variance, and the range as a comparative analysis of the pre- and posttest scores, and (2) analysis of variance was computed to determine the significance among the sample means since the variance among individuals taught by the three methods was homogeneous, a single classification analysis of variance was justified. In this method the total variance among the 147 students is partitioned in two parts: (1) variance among teaching method means, and (2) variance among individuals raught by the same method. The ratio of the two variances (F test) indicates whether or not the means of the groups taught by different methods are significantly different.

Organization of the Study

The report of the study was organized into five chapters. The first chapter is a description of the study, including the background, significance, need, assumptions, and limitations of the study. It also contains the statement of the problem, the hypotheses used to test the problem, a description of the procedures followed in the collection of the data, the research design of the study, the statistical treatments used in analysis of the data,

and the definitions of terms used in the study.

Chapter II consists of a review of selected research studies which are relevant to this study. The procedures which were followed in setting up the experiment and collecting the data is reported in Chapter III, and Chapter IV contains the treatment and analysis of the data. The summary of the study, conclusions based on the findings, and recommendations for further research are included in Chapter V.

CHAPTER II

REVIEW OF SELECTED RESEARCH STUDIES

A number of preliminary exploratory studies have been made by comparing televised instruction with direct instruction. By far the largest category of research is that of "relative effectiveness" studies, in which the performance of students instructed via television has been compared with the performance of others instructed directly, or face-to-face, by a teacher in the traditional way. This therefore represents perhaps the most important trend of media research in the last decade.

The studies selected for review in this chapter are considered to be of particular significance in the overall development of measured performance between students who were instructed via television and those who were taught directly.

One of the more important studies was reported by Carpenter and Greenhill[1] at Pennsylvania State University during the school year 1955. The purpose of the study was

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[1]C. R. Carpenter and L. P. Greenhill, "An Investigation of Closed-Circuit TV for Teaching University Courses," Pennsylvania State TV Research Project, Progress Report, Fall, 1955. (Mimeographed.)

to do an analysis of the effectiveness of conventional courses taught for a full semester over closed-circuit television using moderate cost equipment as compared with the same instruction given in the usual manner. Using the funds from the project, Penn State set up a program of research on courses in General Chemistry, General Psychology, and Psychology of Marriage. In 1957, the research program was continued with the following objectives: (1) extending the project to additional courses, (2) studying instructional variables, and (3) working on methods of improving television instruction.

The Pennsylvania State project is probably the most extensive research program in college television instruction to date. The studies were well controlled and thoroughly reported. The research indicates that there is little loss in student learning in courses taught by television as compared with courses taught by the conventional method. Not only did students learn the information needed to pass examinations, but most did not object strongly to televised classes.

Students in psychology were asked, "how much they liked psychology," and "how much it contributed to their education as compared with other courses they were taking?" On both counts, ratings of the students in the television classes were lower than those of students who were in the same room as the instructor.

The psychology students were asked if they would like to take another course in Psychology. About the same percentages signed up in all three types of classes, but when asked if they would prefer taking it in a large class or by television, a majority preferred television.

Another experiment to determine attitude, learning, and participation differences among students taking a course by ITV* and students who were in the originating lecture room. This was a study conducted by Walton[2] at Michigan State University.

Students were randomly assigned to the in-studio (face-to-face) or ITV treatment groups. Measures of concentration on the subject matter were obtained by tape-recording four lectures, playing back portions and asking the student to indicate what happened next. Participation measures were obtained from instructors' ratings of students on a three-point scale. An attitude toward the course scale was also administered.

There were no differences between the groups on scores on any of the above measures, or on achievement in the course.

An attempt to make a comparison of self-dependent and other-dependent attitudes of students taught

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*Instructional Television

[2]Norma Ruth Walton, "A Pilot Study of Student Attitudes in a Closed-Circuit Television Course By Use of Stimulated Recall" (unpublished Ph.D. dissertation, Michigan State University, 1963).

by television and lecture-discussion methods of instruction was reported by Insel, Schleringer, and Desrosiers.[3]

A total of 375 college freshmen were taught one of the four courses by television during a semester in which the remainder of their instruction was by lecture-discussion methods. After the tenth telecast, each student was asked to describe specific and recent incidents which to them exemplified effective and ineffective television instruction and effective and ineffective classroom instruction.

Televised instruction evoked, or was related to, significantly more other-dependent responses than lecture-discussion instruction. The reporting of what is effective and ineffective in a teaching-learning situation, which has little opportunity for student-to-teacher communication, requires student identification of external factors in order to derive meaning from the situation.

The authors note the frequency with which other-dependent responses occurred in lecture-discussion teaching situations. They state that this may signal a shift in our educational structure to other-dependent attitudes as satisfying and meaningful instead of the individual-dependent attitude usually ascribed to the conventional classroom teaching-learning situation.

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[3]Shepard A. Insel, Kurt Schlesinger, and Wilfred Desrosiers, "Dependency Responses to Televised Instruction," Journal of Applied Psychology 47 (1963), 328-331.

Beatts[4] did a study to determine the teaching effectiveness, student and teacher acceptance, efficiency, and other aspects of closed-circuit television instruction. It was concluded that teachers and students attitudes became increasingly more favorable toward instructional television, and that a reduction in the class time spent was feasible. A secondary result was both the observed and subjectively reported improvement in preparation and teaching ability in the conventional classroom of the TV instructors.

Recognizing that instructor-student interaction is sometimes important in learning, Pennsylvania State installed "2-way" microphones in the receiving rooms. They found that this instructional method was not superior to simple one-way communication. This result is supported by the Army's experience with 2-way communication.[5]

Dunham[6] at Michigan State University attempted to objectively assess the theory that the absence of maximum

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[4]Patrick M. Beatts, "Report on Instructional Closed-Circuit Television." IBM, Poughkeepsie, New York, February 1, 1957. Audio-Visual Communication Review 7 (1959), 306. (Abstract.)

[5]M. F. Fritz, "Survey of TV Utilization in Army Training" (Special Devices Center, 540-01-1, December 31, 1952).

[6]Morton D. Dunham, "An Experimental Study of the Effect of Two Discussion Techniques on Educational Psychology Class Taught by Closed-Circuit Television" (unpublished Ph.D. dissertation, Michigan State University. 1958), p. 168.

feedback would result in a significant difference in educational outcomes between two groups of subjects receiving instruction under conditions of television discussion and face-to-face discussion. No significant differences were found in achievement scores between the face-to-face or television discussion methods.

Dale Wolgamuth[7] in 1961 received a grant to conduct a comparative study at American University using three techniques of student feedback in television teaching. He attempted to determine the relative effectiveness of microphone talkback, vicarious feedback, and electrical signal feedback.

Students were randomly assigned to one of the three feedback conditions or a control group. The electrical-signal feedback condition provided each student with a box having four buttons to indicate various responses. Under this condition the teacher was made aware of student response only if one-fifth of all the buttons were pushed. The vicarious group was theoretically represented by a studio class. The control group had no feedback. All groups saw five 30-minute lectures, but each group saw a different series of lectures.

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[7]Dale Wolgamuth, "A Comparative Study of Three Techniques of Students Feedback in Television Teaching: The Effectiveness of an Electrical Signal Feedback System." U.S.O.E. Grant No. 749096 (Washington, D. C.: The American University, Dec. 11, 1961).

There were no differences among groups on posttest subject matter scores when adjusted for pretest subject-matter scores, and no significant differences when adjusted for both pretest and IQ scores. Also, there were no significant differences among groups on retention scores.

Another attempt to combine the value of interaction with that of television was an experiment in presenting 35 minutes television lesson followed by a discussion period of fifteen minutes conducted by the instructor with eight students in the origination room. Still other students were allowed to leave or to study their notes. As with the other attempt to provide interaction, results showed no significant differences in test performance among students taught by each of these three methods. A poll of students indicated that they preferred two hours of lecture followed by a full period of discussion as opposed to a short discussion each period.

Harshbarger[8] conducted an experimental study by attempting to combine the advantages of discussion and television by using a panel of 14 students in the studio and a 2-way communication with the two viewing rooms in each of which 33 other students could view the discussion of the panel and could interpose questions or comments. A third viewing room contained a control group which could see and

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[8]H. C. Harshbarger, "Closed-Circuit TV -- Is It the Answer?" (Address given at Stillwater, Oklahoma, 1956).

hear but not participate. Courses in "Comparative Foreign Government," "American Government," and "Greeks and the Bible" were taught by this method with good student participation both in the studio and in the viewing rooms. It is evident that this type of presentation faces many of the same problems as must be faced in any attempt to conduct a discussion in a class of 80. If participation is important, the larger the number of students the fewer opportunities each student has to participate. However, studies of conferences suggest that actual participation may be less important, as judged by satisfaction, than a group member's feeling of freedom to participate if he wants to. It may be that when students are in groups of 30, as in the Iowa experiment, they feel more freedom to participate than if all 80 students were in one room. In any case, with good instruction there seems to be a good deal of involvement of students in the viewing room.

Iowa used monitors in the viewing rooms and reported that the attitude of the monitor had a marked effect on that of his students. An enthusiastic monitor apparently can build group spirit in his viewing room even though his part in instruction is virtually nil. On the other hand, if the monitor dislikes TV instruction, students in his viewing room express hostility toward the class.

Another major experimental program in teaching by closed-circuit television was conducted by Buckler[9] at New York University, where courses in English Composition, Survey of English Composition, and Survey of English Literature were given by television. The NYU plan differed from Pennsylvania State and Iowa in that the classes were produced in a television studio with a professional producer and an audio-visual materials coordinator. Students met for two periods in television lecture-demonstration classes, and one period per week in small discussion groups.

Performance for the first semesters were compared on the basis of the Cooperative English Test and student themes, while the second semester comparisons were made on scores taken from the Cooperative English Test of Literary Composition and additional student-written themes.

There was no difference between methods of instruction for students in either section during the first semester, but the adjusted mean scores favored the face-to-face section. During the second semester, high-ability students in the face-to-face section scored significantly higher than high-ability students in the TV section. During the first semester, low-ability students in the face-to-face section scored higher but not significantly, ($p > .05$), than

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[9]William E. Buckler, "A College English Teacher Looks at Television: Composition," Journal of Educational Sociology (1958), 346-352.

the low-ability students in the TV section.

Students in the TV section did better second semester than during the first semester, the author thought, because the students had made an adjustment to TV teaching, the subject matter adapted better to TV presentation, and less time was spent during the second semester discussing the merits of TV as a means of instruction.

Clevenger and Cobin[10] conducted a study at the University of Illinois, in which they compared the effects of TV and face-to-face instruction on academic achievement. Three sections of the basic course in oral interpretation were taught by open-circuit TV. Four sections of the same course were by face-to-face instruction. Graduate student assistants supervised classroom meetings, while one professor taught the TV sections, and two professors taught the face-to-face sections. Television sections rotated between the TV studio where they served as a participating class and the receiving classrooms.

Achievement was measured by scores on a common general-content test of 74 true-false items which had been pretested and determined to be representative of the material that should have been covered in the course. This test was administered to all sections as a pretest at the

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[10]Theodore Clevenger, Jr. and Martin T. Cobin, "An Experiment in Open-Circuit Television Instruction in the Basic Course in Oral Interpretation," Speech Monographs 26 (1959), 149-154.

beginning of the semester and as a posttest at the end of the semester. Reading ability was determined by jury evaluation of tape recordings made by each student at the beginning and end of the semester. Points were assigned to each reading and the judges did not know whether the reading was a pretest or a posttest. Scores were obtained by summing the ratings and subtracting posttest from pretest.

The results showed no significant difference between the TV taught and face-to-face taught sections for poetry and prose reading improvement ratings, since there was no significant difference between the TV and face-to-face taught sections in content gains from pretest to posttest. The investigators concluded that it is possible, when conducting a course in oral interpretation via open-circuit TV, using graduate assistant instructors, for it to be equally as effective as face-to-face teaching by experienced faculty members.

Another attempt to compare students' learning and attitudes toward ITV and face-to-face instruction was made by Bobren and Siegel.[11] Students were assigned to face-to-face or ITV presentation treatments, and the sections were taught by different instructors. Face-to-face students met

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[11]Howard M. Bobren and Sheldon L. Siegel, "Student Attitudes Toward Closed-Circuit Instructional Television," Audio-Visual Communication Review 8 (1960), 124-128.

in groups of 12 for their classes; ITV students (N=60) assembled in one room to hear the ITV lecture, and then met in smaller groups for discussion. At the end of the course, all students took the Semantic Differential Test. Each subject rated the following statements on 11 polar scales: (1) the instructor is in the classroom, (2) teaching where the instructor is on television, (3) this course, and (4) your instructor(s) in this course. Bobren and Siegel found no significant differences in mid-term or final examination grades between the two groups.

Another attempt to determine students' attitudes toward small classroom, ITV, and large classroom presentations was made by French[12] at the University of Missouri. The first semester, students of Social Foundations of Education were taught in a small-classroom. The next three semesters, the course was presented on ITV. The fifth semester, students convened in a large lecture hall. The same professor taught all sections. French found no significant differences among group means in scholastic aptitude, grade point average, previous coursework pattern, or age. Scholastic aptitude means of all four groups were about one-half a standard deviation above the mean for

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[12]Joseph L. French, "A comparison of student attitude in three instructional conditions: small classroom, instructional television, and large lecture hall [Columbia]" (University of Missouri, Aug. 21, 1963). (Mimeographed.)

university freshmen; none of the students were on probation, and all were enrolled for 12 hours or more of coursework. Small-classroom viewing of ITV showed a significant difference over face-to-face presentation in a large classroom; attitudes.

At least one research project attempted by Spragens[13] at Stephens College in the use of closed-circuit television has resulted not in reducing the number of teachers needed for a given number of students but rather in adding to the need for additional staff. Stephens College had used television as a means of providing a stimulus for discussion. Briefly, the Stephens plan was to bring to Stephens each semester an outstanding visiting teacher to deliver a twenty-minute lecture twice a week. This lecture was carried by television to fifty classrooms containing fifteen to twenty students and a member of the Stephens faculty. As soon as the television presentation was completed, classroom discussions began in each of the classrooms.

The Stephens experience was unique in one respect. While all of the other television projects had failed to achieve faculty acceptance, the Stephens faculty seemed to be interested in, and even enthusiastic about, the plan.

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[13]T. A. Spragens, "Plus Factors in the Application of Closed-Circuit Television to General College Instruction" (Address delivered to the Association of Land Grant Colleges and Universities, 1955). (Mimeographed.)

Not only did the course provide a common topic for discussion by the students, it also provided a common intellectual experience for the faculty. With a large part of the faculty involved in leading discussion groups, and many of the others watching the television presentations, faculty members as well as students had common experiences and problems which they could discuss with members of other departments. Furthermore, in their own teaching, faculty members could refer to points raised in the television presentations, knowing that this, at least, was common to the background of the students.

Another major project in closed-circuit instruction was that of Miami University conducted by Macomber and Siegel.[14] Miami was of special interest because the courses being televised included subjects not previously taught via closed-circuit television, such as educational psychology, physiology, sociology, and human biology, because they were comparing closed-circuit television both with large lecture classes and small semi-discussion classes; and because they were studying the possible differential effect of different types of instruction on achievement scores of students of differing abilities.

Like New York University, Miami attempts to use each method at its best. The television courses utilize

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[14]F. G. Macomber and L. Siegel, Experimental Study in Instructional Procedures (Oxford, Ohio: Miami University Press, 1956).

professional directors. Audio-visual assistance was also available for use both in television and in the other classes. The result was that the television classes did gain and hold student attention.

Student ratings of television instruction were inversely correlated with student ability. While the best television instructors are viewed favorably by all types of students, the better students ordinarily disliked television and large classes more than the poorer students. However, attitudes toward television were not highly correlated with achievement. Students who dislike television do as well as those who like it.

Both in large lectures and in television sections, students complain of lack of contact with the instructor, but, in general, Miami students disliked television less than large lectures, although their attitudes toward television tended to become more negative as the semester progressed. (It should be noted that Miami has a tradition of small classes.) If they could have the same instructor, Miami students generally would have preferred a small-class over television or a large class, but they would have preferred television or a large class to the small class if they could be sure of an excellent instructor in the television or large class.

The evidence reported in the study by Macomber and Siegel appears to demonstrate that television courses that

utilize professional directors, and audio-visual assistance may increase learning and hold student attention as well as most good classroom lectures. This appears to have important implications for the present study.

CHAPTER III

PROCEDURES

The purpose of this study was to determine the comparative effectiveness of three methods of instruction through the use of closed-circuit television: (1) closed-circuit television in a large class setting, (2) occasional viewing of video tape on a selective basis in a large classroom setting, and (3) face-to-face contact in a television studio while the lesson was being video taped. The experimental population for this study was composed of 147 secondary, pre-service teachers who were enrolled in Education 141 at the University of Oklahoma. The students were divided into the three groups during regular enrollment period.

Four staff members were involved as teachers of the three groups; two of these staff members were special instructors, and two had faculty status. The television sections of the course were coordinated by adherence to a common syllabus and the teacher of the control group was encouraged to teach the course in whatever manner seemed most effective to him.

The television and face-to-face groups were taught in a sequence of units. Each unit consisted of formal lectures. Lectures were presented by the television instructor and occasional resource persons, and were received by means of a television monitor placed in each classroom. At the end of the thirty-minute TV lecture, the remaining twenty-minute portion of the class was devoted to a discussion period conducted by the special instructors in the television sections and by the television lecturer in the face-to-face section.

The variable of faculty competence was considered and recognized, but in as much as all faculty members are selected by a committee of the faculty, and approved by the Board of Regents of the University, it was thought that approximate equality of competence could be assumed. In order to further assure as much control of this variable as possible, weekly meetings were held with Education 141 instructors for the purpose of substantive and supplementary materials to be presented to all groups involved in the study.

Experimental Population

Every candidate for a secondary teaching certificate at the University of Oklahoma is required to take Education 141 from which the experimental sample for this study was drawn. Education 141 is the last formal education course required prior to the student's practice teaching experience. Students in the study are undergraduates who are classified

as either juniors or seniors.

Scheduling

The subjects for this study were students who were enrolled in the course, Education 141 during the Spring semester of the school year 1969-70. These students were randomly assigned to each section during the regular enrollment period. Since many students tend to show preferences for instructors and for the time at which courses are offered, randomness of sample with respect to these factors was effected by randomly assigning subjects to the various sections. Approximately equal numbers of enrollees were maintained in each section throughout each registration day. The random selection procedure gave each student an equal chance to be included in any one of the sections, regardless of the time at which the student was scheduled to enroll. This resulted in approximately 30 students being enrolled in each section. After the enrollment was completed, students were not allowed to change sections.

Instructional Procedure

During the first semester of 1969-70, the four instructors of Education 141 met in a planning period one hour per week for approximately fifteen weeks. The purpose of the meeting was to design a series of units to be taught by the television lecturer during the second semester. The four-member team, led by the television lecturer, made

suggestions and contributions to the series of units which were to be presented during the second semester.

During the second semester of 1969-70, the first complete attempt was made to use closed-circuit television facilities to teach Education 141 to all regularly enrolled students. The primary objective was to develop the most effective techniques for instructional television, and then compare the results with those achieved by full-time permanent faculty members teaching classes by conventional methods.

The television offering involved three classes of Education 141. Each section was assigned a special instructor who viewed the video-tape lessons with his students and conducted the discussion sessions at the conclusion of daily lectures. All sections met four hours weekly for fifteen weeks. The face-to-face and television course classes progressed through a series of units consisting of three basic elements: (1) lecture by the television teacher, (2) presentations by occasional outside resource persons, and (3) micro-teaching.

Lectures were given by the television instructor, with students taking notes and receiving mimeographed materials. Use was made of overhead transparencies, chalk board, filmstrips, 16 mm. sound motion pictures, and other media.

Outside resource persons were utilized in areas such as human relations, learning theory, and special reading problems in secondary education. Lectures by resource persons were presented to the face-to-face section in the same manner as the regular television course lecture, except that the lectures were video taped and beamed to the television sections at their regularly prescribed times.

For twelve weeks of the semester, one hour each week was set aside for micro-teaching, and all students in Education 141, including one in the control group, participated in this aspect of the course. The experience in micro-teaching was on a teach-reteach basis. The two demonstrations were approximately three to five weeks apart. Each trial was recorded on video tape and replayed immediately for the student who had made the presentation. The students in Education 141 assisted in critiquing each presentation.

Collection of Data

There were two measurements taken on each student included in the study. These were (1) a score on a written pretest, and (2) a score on a posttest.

Pretest.--A pretest was administered to all students prior to the beginning of the first unit of the course. The items for the test were selected from a body of items previously administered to similar groups and analyzed as to level of difficulty, discriminating power, and reliability.

These data were analyzed by a one-way analysis of variance, followed by tests of reliability and validity computed on the test items.

Posttest.--A posttest which was identical to the pretest was administered at the conclusion of the course. The results of the test-retest reliability computations are given in Table 1.

TABLE 1

TEST-RETEST RELIABILITY OF THE INSTRUMENT

Administration	Number of Items on Test	Number of Subjects Taking Test	Variance of Test	Sum of pq	Reliability
Pretest	50	105	32.365	17.176	.4726
Posttest	50	175	15.219	10.235	.6219

Validity of the Test-Retest Instrument

The validity of the instrument used on the pretest and posttest was calculated using a technique suggested by Downie and Heath.[15] In this procedure, the validity of a test is the correlation between a set of test scores with an external measure. In this study the external measure used in the computation of the validity for the pretest was the item-test correlation coefficients. Whereas, the external

[15]N. M. Downie and R. W. Heath, Basic Statistical Methods (New York: Harper and Row, 1965), p. 263.

measure used in computing the validity of the posttest was the item-item correlation coefficients of the pretest scores with the posttest scores. The results of these two tests are given in Table 2.

TABLE 2

TEST-RETEST VALIDITY OF THE INSTRUMENT*

Test Administration	Correlation of X and Y	Validity
Pretest	.4225	.3618
Posttest	.6773	.5304

*Since this was a Test-Retest situation, the predictive validity of the instrument was the only type of validity sought.

Statistical Design

The data obtained for this study were given the following statistical treatment: (1) The variances among the three groups was tested for homogeneity, and (2) A single-classification analysis of variance was performed. This method partitions the total variance of the 147 *Ss* into two parts: (a) variance among teaching methods (between), and (b) variance among individuals (within). The resulting *F* ratio indicates whether mean differences exist among the three groups. The paradigm on page 35 is an illustration of how the data were tabled for analyzing. In this method the total variance among the 147 students is

partitioned in two parts: (1) Variance among teaching method means, and (2) Variance among individuals taught by the same method. The ratio of the two variances (F test) indicates whether or not the means of the groups taught by different methods are the same. The following paradigm shows the way the data were tabled in computing the analysis of variance statistic.

Methods of Teaching

Face-toface lecture in a T.V. studio (full professor)	Video Tape with 20 min. group interaction with special instructors	Traditional lecture method with some video tape viewing (full professor)
S_1	S_1	S_1
S_2	S_2	S_2
S_3	S_3	S_3
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
S_{39}*	S_{82}*	S_{26}*

*Total N = 147

CHAPTER IV

ANALYSIS OF THE DATA

Presentation of the Analysis

Data were collected on each student taught by each of the three methods. The three groups of students were randomly assigned to Group "A," "B," or "C." These groups were treated as follows: Group A was taught by face-to-face contact in a television studio where the lesson was being video taped; Group B was taught by video-taped lectures which were beamed to the various sections at appropriate times, and presided over by special instructors with twenty minutes of interaction following the video-tape presentation; and Group C was taught by an instructor with professorial rank with occasional viewing of video-tape lectures on a selective basis, but otherwise taught in the traditional method of instruction.

Before the analysis of the data collected in this experiment can be effected, it is necessary to give a short explanation of the scores which were compared for each of the groups.

In experimental work investigators frequently use a design involving the comparison between an experimental and

a control group. There is always a problem in an experimental situation in which the two groups (or more, as in our case) cannot be manipulated in a completely random fashion. When subjects are allowed to randomly distribute themselves into groups, there is always a "self-sort" bias.[1] For instance, to pick the first ten students who come to class each day as a random representation of the class as a whole is probably a biased sample since the more intelligent or better prepared students will tend to arrive first. Because of this biasing tendency, it becomes necessary to make comparisons only on the amount of change the subjects experience between the pretest and posttest administration. When the pretest and posttest and identical in kind, the experimenter's main interest is in the amount of change experienced by each of the groups.

Figure 1 shows the possible combinations of means and comparisons which can be made in an experimental situation.

There are many comparisons which can be made, however, most of them will not yield the information sought in this experiment. For instance, the comparison of $\underline{M}_{e1}$ and $\underline{M}_{c1}$ or $\underline{D}_1$ would only be meaningful if the experimenter had tried to match the two groups in the beginning. This would indicate whether or not the groups were different at

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[1]B. J. Underwood, Psychological Experimentation (New York: McGraw-Hill Book Company, 1965).

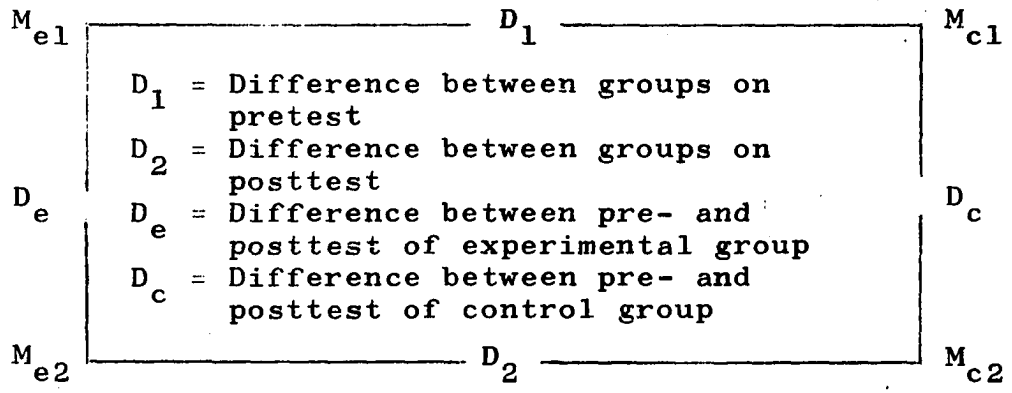


Fig. 1.--Diagram to illustrate comparisons of a pretest - posttest design

the beginning of the experiment. Even if they were, the experimenter had no recourse but to use the groups designated.

Likewise, a comparison of groups, $\underline{M}_{e2}$ and $\underline{M}_{c2}$, or $\underline{D}_2$ would be meaningless if the two groups were different in the beginning. Such a difference would simply tell whether a difference that existed at the beginning of the experiment still existed at the end of the experiment.

What is required, then, is a statistical test of the difference between <u>changes</u>. According to Downie and Heath the simplest approach is to treat the changes as the quantities to be compared, whether they are means of changes or sets of individual changes.[2] In this experiment the difference between the pretest and posttest scores was treated as a raw score for each individual. These scores

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[2]N. M. Downie and R. W. Heath, p. 205.

are given in Appendix D.

The hypotheses were tested using these change scores in the Analysis of Variance Tests. The F_{max} Test for Homogeneity of Variance revealed these scores to be homogeneous in the comparisons required for testing both hypotheses.

Results of Testing Hypothesis One

Hypothesis One stated that there would be no difference in achievement in favor of the face-to-face instruction group over the sections viewing the lecture by video tape and presided over by special instructors and the section taught by an instructor with professorial rank and occasional viewing of video tapes on a selective basis. In order to test this hypothesis it was necessary to use a one-way Analysis of Variance statistic preceded by a test for homogeneity of variance. Since the groups proved to be homogeneous, ($F_{max} = 1.51$, $p < .05$), the Analysis of Variance was performed. The results are given in Table 3.

TABLE 3

ANALYSIS OF VARIANCE FOR HYPOTHESIS ONE

Source of Variation	Sum of Squares	d.f.	Mean Square	F.	P.
Between (SS_b)	1,630.254	2	815.127	10.9688	.001
Within (SS_w)	10,701.07	144	74.313		
Total (SS_t)	12,331.32	146			

Table 3 shows the three means to differ at a highly significant level ($p < .001$). This would indicate that the scores recorded for the three groups were influenced by the three different teaching methods.

Results of Testing Hypothesis Two

Hypothesis two stated that there would be no difference in achievement in favor of sections viewing the lecture by video tape and presided over by special instructors over the sections taught by an instructor with professorial rank and occasional viewing of video tapes on a selective basis. This hypothesis was tested using a two-sample Analysis of Variance Test[3] preceded by a test for homogeneity of variance. Since these two groups possessed homogeneous variances, the ANOVA was performed. The results of this test are given in Table 4.

Table 4 shows the means of Groups 2 and 3 to be significantly different ($p < .001$). This result would indicate that those subjects who were viewing video tapes and being presided over by special instructors scores significantly higher gains on the pretest-posttest administration of the instrument.

In an attempt to locate specific differences among the individual means, individual *t* tests were performed on all possible combinations. The results of these tests

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[3] Ibid., p. 223.

TABLE 4

ANALYSIS OF VARIANCE FOR HYPOTHESIS TWO

Source of Variation	Sum of Squares	d.f.	Mean Square	F.	P.
Between (SS_b)	2,266	1	2,266	83.93	.0001
Within (SS_w)	2,861	106	27.0		
Total (SS_t)	5.127	107			

are given in Table 5.

TABLE 5

COMPARISON OF MEANS OF INDIVIDUAL GROUPS

Groups Compared	Mean of first group	Mean of second group	s.d. of group one	s.d. of group two	t
A vs. B	15.69	20.90	7.56	9.27	3.31*
A vs. C	15.69	12.69	7.46	7.54	2.50*
B vs. C	20.90	12.69	9.27	7.54	4.56*

*Significant at the .01 level.

The results recorded in Table 5 show a difference between all combinations of means ($p < .01$).

Group B, the group which was taught by video tapes and interaction led by special instructors, was actually comprised of three different subgroups. These subgroups

were taught by two different special instructors. As an attempt to further analyze Group B, the individual subgroups were compared with each other and with all other combinations of means. The results of these comparisons are presented in Table 6.

Table 6 shows mean differences between Groups A and B(2), B(1) and B(2), B(1) and B(3), and B(1) and C. However, the only two of these mean differences that can be interpreted are the differences between A and B(2) and B(1) and C, since the orthogonality of the means of B(1), B(2), and B(3) cannot be insured; i.e., since they are components of the same group, it cannot be insured that the means are individually independent of each other. According to Siegel, if the independence of two means cannot be insured then the difference between the two is, in part, dependent on both. This dependence upon both keeps the difference from being a true difference between the two means.[4]

Interpretation of the Results of Hypothesis One and Two

The results of the testing of Hypothesis One showed significant mean differences between Group A (those subjects who were taught by face-to-face instruction in a TV studio by an instructor of professorial rank), Group B (those

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[4]S. Siegel, Non-Parametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Company, 1956), pp. 63-67.

TABLE 6

MATRIX OF MEAN COMPARISONS

		Group B			
	Group A	Group B(1)	Group B(2)	Group B(3)	Group C
G_A	X	$X_1 = 12.69$ $s_1 = 7.54$	$X_1 = 12.69$ $s_1 = 7.54$	$X_1 = 12.69$ $s_1 = 7.54$	$X_1 = 12.69$ $s_1 = 7.54$
		$X_2 = 25.93$ $s_2 = 9.09$	$X_3 = 18.57$ $s_3 = 8.19$	$X_4 = 18.00$ $s_4 = 8.26$	$X_5 = 15.69$ $s_5 = 7.46$
		$t = 1.587$	$t = 2.756^*$	$t = 2.419^*$	$t = 1.577$
$G_{B(1)}$	X	X	$X_2 = 25.93$ $s_2 = 9.09$	$X_2 = 25.93$ $s_2 = 9.09$	$X_2 = 25.93$ $s_2 = 9.09$
			$X_3 = 18.57$ $s_3 = 8.19$	$X_4 = 18.00$ $s_4 = 8.26$	$X_5 = 15.69$ $s_5 = 7.46$
			$t = 3.182^*$	$t = 3.357^*$	$t = 4.892^*$
$G_{B(2)}$	X	X	X	$X_3 = 18.57$ $s_3 = 8.19$	$X_3 = 18.57$ $s_3 = 8.19$
				$X_4 = 18.00$ $s_4 = 8.26$	$X_5 = 15.69$ $s_5 = 7.46$
				$t = .2543$	$t = 1.473$
$G_{B(3)}$	X	X	X	X	$X_4 = 18.00$ $s_4 = 8.26$
					$X_5 = 15.69$ $s_5 = 7.46$
					$t = 1.147$
G_C	X	X	X	X	X

*Significant; p .05.

subjects who were taught by viewing video tapes followed by twenty minutes of interaction presided over by special instructors), and Group C (those subjects who were taught by an instructor with professorial rank with occasional viewing of video tapes on a selective basis) ($p < .001$).

The results of testing Hypothesis Two showed significant differences between the subjects of Group B and Group C ($F = 83.93$, $p < .0001$). This would indicate that those subjects who were taught by viewing of video tapes followed by twenty minutes of interaction presided over by special instructors made significantly higher gains in achievement than those subjects who were taught by an instructor with professorial rank with occasional viewing of video tapes on a selective basis.

CHAPTER V

SUMMARY, FINDINGS, PRE-CONCLUDING REMARKS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was designed to determine the comparative effectiveness of three methods of instruction through the use of closed-circuit television. More specifically, the problem was to ascertain if there was a difference in achievement relative to the course, Education 141, when taught by closed-circuit television in a large class setting, when taught by occasional viewing of video tape on a selective basis in a large classroom setting, in comparison with the same class taught by face-to-face contact in a television studio while the lesson is being video taped.

The data for this study were collected during the Spring semester of the school year 1969-70. The subjects for the study were those students enrolled in five sections of Education 141. During the regular registration period the students were randomly assigned to the various sections. The randomness of sample was further assured by having approximately equal numbers of students maintained in each section throughout each registration day. The randomizing

procedure gave each student an equal chance to be included in any one of the sections, regardless of the time at which the student was scheduled to enroll. After the enrollment was completed, no students were allowed to change sections.

The television offering involved three classes of Education 141. Each section viewed the video-tape lessons under the supervision of a special instructor who then conducted the discussion sessions at the conslusion of each daily presentation. All sections met four hours weekly for fifteen weeks (one semester). The face-to-face and television course classes progressed through a series of units consisting of three basic elements: lecture by the television teacher, presentations by occasional outside resource persons, and micro-teaching.

Two measures were taken on each student included in the study. These were (1) a score on a written pretest, and (2) a score on a posttest.

These data were given the following statistical treatment: The pretest scores were subtracted from the posttest scores to determine the amount of change. These change scores were treated as raw data. An F_{max} Test was performed on the data as a test of the homogeneity of the variances. Since the three groups were found to be homogeneous, a one-way analysis of variance was performed to test Hypothesis One. The results showed the means of the three groups to be significantly different ($p < .001$). In

testing Hypothesis Two, a two-sample analysis of variance was performed between Group B and Group C -- the video-tape sections and the section taught by a professor with occasional viewing of the tapes, respectively. The results showed an extremely high difference between the two means ($F = 83.93$, $p < .0001$).

In an attempt to locate specific mean differences, *t* tests were performed between Groups A and B, A and C, and B and C. Group B was further reduced to three subgroups -- the three classes which were combined to make up Group B. The *t* test was performed between all possible means ($p = .01$).

Findings

The results of the testing of Hypothesis One showed significant mean differences between Group A (those subjects who were taught by face-to-face in a TV studio by an instructor of professorial rank), Group B (those subjects who were taught by viewing video tapes followed by twenty minutes of interaction presided over by special instructors), and Group C (those subjects who were taught by an instructor with professorial rank with occasional viewing of video tapes on a selective basis) ($p < .001$).

The results of testing Hypothesis Two showed significant differences between the subjects of Group B and Group C ($F = 83.93$, $p < .0001$). This would indicate that those subjects who were taught by viewing of video tapes followed by twenty minutes of interaction presided over by special

instructors made significantly higher gains in achievement than those subjects who were taught by an instructor with professorial rank with occasional viewing of video tapes on a selective basis.

Pre-Concluding Remarks

As an attempt to avoid any misinterpretation or overinterpretation of the findings of this study, the investigator deems it necessary to offer further implications about the results. The first and foremost statement to be made is that this study was designed to evaluate different methods of instruction and not to evaluate instructors. Therefore, no conclusions can be made about the particular individuals who acted as instructors. There are several reasons why this is so: (1) The study was not designed to study different instructors. To restate the purpose of a study after the data have been collected is not only improper, but unethical. (2) No measure of any kind was taken on the instructors, either quantitative or qualitative. The measures taken on the subjects of any one instructor cannot be interpreted as a measure of that instructor since the uncontrolled variables which enter into such a measure are phenomenal. (3) Those groups taught by the special instructors had access to the video tapes as well as the benefit of interaction in the classroom. In other words, those groups who were taught by the special instructors could have had all the benefits of the lecture sections plus the

interaction which is so necessary for learning to be reinforced. It is at this point that the positive side of this study can be accented.

This study can be interpreted as a comparison of methods of presenting material. The results would indicate that the interaction of the participants is an important item in the assimilation of material presented.

Conclusions

Under the conditions of this study and on the basis of an analysis of the data collected, the following conclusions seem warranted:

1. Instruction by face-to-face contact with the television instructor in a television studio while the lesson was being video taped did not make a significant difference in the achievement scores recorded for subjects enrolled in Education 141.

2. Instruction by video tape viewing followed by interaction led by special instructors makes a significant difference in the achievement scores recorded for subjects enrolled in Education 141.

3. Instruction by occasional viewing of video tapes and otherwise taught by an instructor with professorial rank in the traditional lecture method did not make a significant difference in the achievement scores recorded for subjects enrolled in Education 141.

Recommendations

Based on findings of this study and the knowledge gained by the investigator, the following recommendations are made for a further research project:

1. Another study should be conducted using the methods of instruction used with Groups A and B of this study.

2. The design should be a four-group Solomon's Design with random selection and assignment of subjects to each of the four groups. (See Figure 2.)

R	O_1	X	O_2	O_1 = Pretest
R	O_1		O_2	R = Random selection of Ss
R		X	O_2	O_2 = Posttest
R			O_2	X = Experimental Treatment

Fig. 2.--Design of Study: Four-Group Solomon Design

3. The population and sample should be expanded to include School in American Culture, Psychology in Ecucation, Psychology in Early Childhood, and Curriculum and Instruction in Elementary Education.

4. The test instrument should be a well-standardized test concerning School in American Culture, Psychology in Education, Psychology in Early Childhood, and Curriculum and Instruction in Elementary Education.

5. The data should be analyzed with an analysis of covariance statistics using an I.Q. measure taken from the

Otis Quick Scoring Intelligence Test at the beginning of the course as the concommitant variable.

Implications

From the results indicated in this study it appears that greater effort should be made to acquaint all instructors in the College of Education with the opportunities which are now available for their use in the utilization of closed-circuit television. Through this medium a greater concern for more variety of instructional methods should be considered in all areas of education.

Closed-circuit television has the capability of extending well qualified instructors and above-average teaching resources to larger numbers of students, especially with the use of graduate assistants, or special instructors to preside over and carry-on interaction following the telecast or video-tape presentation.

The results of the experiment imply that many multiple section courses in education could be effectively taught through the use of television. These findings seem to imply:

1. that most multiple sections in the College of Education could be taught with a smaller number of professorial-rank professors than are now being employed,
2. that more effective use could be made of graduate assistants and special instructors by having them

preside over and, carry-on interaction with most multiple-classes,

3. that the use of micro-teaching techniques should be used more in all undergraduate education courses, and
4. that more use could be made of televised observational experiences which are not otherwise feasible.

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APPENDIX A

PRE- AND POSTTEST

APPENDIX A

PRE- AND POSTTEST

Select the item that is most appropriate. There is only one response to each item. Mark the correct response in the proper space on the answer sheet; be certain to erase completely your first choice. Please do not write or make any marks on the examination sheets.

1. Which of the following can be considered a product of American education?
   a. Comprehensive high school
   b. Elementary school
   c. Reporting student progress
   d. Vocational education

2. The Central Purpose of American Education, as stated by the Educational Policies Commission, is best states as:
   a. Social education
   b. Consumer education
   c. College preparatory
   d. Development of rational powers

3. Which of the following has made the most recent contributions to the concept of the comprehensive high school?
   a. James Conant
   b. John Dewey
   c. Arthur Bestor
   d. Admiral Hyman Rickover

4. Which of the following is a requirement for modular scheduling?
   a. Use of a computer
   b. Building with flexible walls
   c. A counselor for each grade
   d. Individual carrels for each student

5. Which of the following is not recognized as a function of the modern junior high school?
   a. Exploration
   b. Socialization
   c. Economy
   d. Guidance

6. Which of the following is a pressure affecting the development of the curriculum in a local school?
   a. College entrance requirements
   b. Publishers of textbooks
   c. Community power structure
   d. All of the above affect the development of curriculum

7. In which of these statements are the institutions listed in the chronological order of their development?
   a. Latin grammar school, the tuition academy, the public high school, the junior high school
   b. Latin grammar school, the tuition academy, the junior high school, the public high school
   c. The tuition academy, the Latin grammar school, the public high school, the junior high school
   d. The Latin grammar school, the public high school, the tuition academy, the junior high school

8. Which area of the curriculum has remained most traditional with respect to innovation changes?
   a. Mathematics
   b. Social Studies
   c. Science
   d. Foreign Language

9. In 1918 the Commission on Reorganization of Secondary Education issued an influential document containing
   a. a proposed amendment to the constitution about federal aid
   b. a new statement of goals for the NEA
   c. the seven cardinal principles of education
   d. a list of objectives specifically designed for senior high schools

10. The primary purpose of academic subjects in the curriculum is to provide
   a. a systematic study of the disciplines
   b. a means of eliminating students with low I.Q.'s from the school
   c. general education for all
   d. college preparatory courses for the academically gifted student

11. Without help from the teacher, the learner will probably not move readily
    a. from preoperational to concrete operational
    b. from formal operational to concrete operational
    c. from preoperational to formal operational
    d. from concrete operational to formal operational

12. Piaget's research would suggest
    a. intensified developmental reading programs
    b. more extensive use of media in junior and senior high schools
    c. re-examination of school articulation
    d. all of the above

13. Examination of the American public school curriculum, in light of Piaget's research, suggests
    a. inadequate curriculum
    b. inadequate resources
    c. inadequate methodology
    d. inadequate academic preparation of students

14. Which word or phrase best describes "inquiry" method?
    a. student involvement
    b. student reports
    c. student panels
    d. teachers asking pertinent questions of students

15. Which of these is a channel of communication for teaching and learning?
    a. verbal communications
    b. written language
    c. sign language
    d. all of the above

16. The curriculum is comprised of all the experiences of children for which
    a. the state assumes responsibility
    b. the federal government assumes responsibility
    c. the school assumes responsibility
    d. all of the above

17. Oklahoma schools are affiliated with the accrediting association known as
    a. Western Association of Colleges and Secondary Schools
    b. North Central Association Colleges and Secondary Schools
    c. Southern Association of Colleges and Secondary Schools
    d. none of the above

18. A comprehensive curriculum most closely means a curriculum which provides
    a. for vocational training as well as college preparatory
    b. a wise use of materials found outside the textbook
    c. individualized instruction
    d. one which strives to meet the needs of every child

19. Which of the following would be one practice in the school which would not help the drop-out problem?
    a. Have good adult education programs
    b. Improve basic attitudes of teachers and students
    c. Activity programs for <u>every</u> student
    d. Use same standards to evaluate low ability students and high ability students

20. Student participation is the best way to teach
    a. democracy
    b. mechanical learning
    c. all facets of communication
    d. all of the above

21. The most significant problem created by advancing science and technology is
    a. a changing role for the United States in world politics
    b. physical mobility
    c. affluence
    d. more skilled and fewer semi-skilled jobs

22. Sound curriculum decisions must be based on information about
    a. population explosion
    b. shifts in age distribution
    c. shifts in population centers
    d. all of the above

23. 16 mm. refers to the
    a. speed of film
    b. width of film
    c. length of film
    d. thickness of film

24 Which of the following is a disadvantage in using the opaque projector?
    a. the lack of the availability of suitable materials
    b. the materials for projection require extensive preparation
    c. the room must be darkened
    d. the difficulty to operate

25. Tape-recorders erase automatically when
    a. rewinding
    b. recording
    c. playing
    d. in fast forward

26. The order of mechanical steps to be taken when preparing to show a film are:
    a. turn lamp on, motor on, volume up
    b. turn volume up, motor on
    c. turn motor on, lamp on, volume up
    d. makes no difference

27. Programmed instruction is considered an effective tool for teaching because
    a. it is easier for the teacher
    b. it makes children cover more material
    c. it gives students immediate knowledge of progress
    d. it is intra-correlated

28. Traditionally, the aim for assigning homework has been to
    a. review for class and term tests
    b. drill
    c. develop habits of working hard
    d. instill concepts

29. The daily homework assignment should usually
    a. not include exercises on the new work if the class understands it
    b. have part devoted to review and part based on the new lesson
    c. consist, for the most part, of reading ahead in the new work to be taught
    d. be patterned after standardized test type questions

30. Most fundamental with regard to the provision of leadership in a democratic society:
    a. leadership based on a value system to which the society is committed
    b. leadership which is dynamic and aggressive
    c. leadership which is imaginative
    d. leadership which understands and accepts goals

31. Traditionally, tests have been given
    a. daily
    b. at the completion of a unit
    c. without previous notice
    d. weekly

32. Of the following, the prime learning purpose of grouping pupils is to
    a. develop social attitudes
    b. separate unruly pupils
    c. provide the teacher with a smaller range of pupil ability
    d. help solve book shortages

33. Of the following, the least proper use of the textbook is as
    a. a quick view of things to be learned
    b. a minimum for which pupils may be held responsible
    c. the course of study
    d. a reference for pictures, maps, graphs, and tables

34. Of the following, the one which is usually the least important purpose for giving a quiz is that it
    a. is often part of the learning process
    b. often provides a basis for remedial work
    c. gives an opportunity for additional review and drill
    d. provides objective evidence on which to base marks

35. Objectives for education should be stated in behavioral terms of
    a. knowledge
    b. skills
    c. attitudes
    d. all of the above

36. Unit teaching is advantageous because it
    a. minimizes teacher preparation and follow-up
    b. constitutes the entire curriculum
    c. provides opportunities for a variety of learning experiences
    d. is easy to schedule

37. When teaching a new topic, the teacher should
    a. make sure that all homework difficulties have been corrected before teaching the new material
    b. allow sufficient time for a full presentation of the new material
    c. teach the new material before any discussion of the homework
    d. warn pupils that they will be tested on the new material the next day

38. Of the following, the generally least accpetable type of short answer question is
    a. multiple choice
    b. completion
    c. true-false
    d. matching

39. Of these statements concerning the use of the overhead projector, which is not true?
    a. It may not be used with a page of the textbook
    b. It enables the teacher to observe the class reaction
    c. It may be used with transparencies and with overlays
    d. It requires an additional person to operate it

40. There is good evidence that the high school of the future will take a sharp look at
    a. the regular academic subjects
    b. the special subjects
    c. the electives
    d. the time factor

41. Which of the following is not necessarily an attempt at better staff utilization:
    a. team teaching
    b. tracks, levels, and rails
    c. use of television
    d. action to study curriculum for next year

42. Probably the best method to use to encourage homework being done properly is to
    a. assign it from a text
    b. have it checked consistently
    c. make it simple
    d. avoid assigning more than one hour of work per evening

43. Which of the following is <u>not</u> a cardinal principle of education?
    a. Health
    b. Moral character
    c. Command of fundamental processes
    d. Worthy home membership

44. Of the following, an educational approach to teaching which receives much attention at this time is one
    a. employing a master teacher and assistant teachers with a large group of pupils
    b. recommending abandonment of all pupil laboratory experimentation
    c. advocating the use of television as the sole means to learning
    d. suggesting the elimination of all textbooks in the teaching process

45. In general, lesson plans should
    a. include all questions to be asked during the lesson and, as a rule, to be followed faithfully
    b. contain only the key questions, and permit a certain amount of days it lasts
    c. cover an entire unit's work regardless of the number of days it lasts
    d. be the same for all classes of the same grade of work

46. Which of the following Acts first provided for technical education:
    a. Smith-Hughes
    b. The Vocational Act of 1963
    c. National Defense Education Act
    d. none of the above

47. Many Vocational-Technical Centers provide training in
    a. electronics technology
    b. industrial chemistry
    c. computer technology
    d. all of the above

48. The maximum number of students permitted in classes for mentally retarded in Oklahoma is:
    a. 20
    b. 15
    c. 10
    d. 40

49. The per pupil cost for training exceptional children is generally
    a. more than
    b. less than
    c. the same as
    d. cost not known at present

50. A well-qualified inexperienced teacher usually has the least amount of difficulty with which one of the following?
    a. technique of questioning
    b. subject matter
    c. handling of discipline problems
    d. determining the levels of difficulty at which to teach

APPENDIX B

RESULTS OF ITEM ANALYSIS OF PRETEST

APPENDIX B

RESULTS OF ITEM ANALYSIS OF PRETEST

	Number of Rights in High Group	Number of Rights in Low Group	Number of Discriminations	Good Item	Difficulty
1.	24	22	2	Yes	.91
2.	25	19	6	Yes	.88
3.	14	11	3	Yes	.47
4.	19	8	11	Yes	.51
5.	25	19	6	Yes	.91
6.	25	21	4	Yes	.91
7.	20	17	3	Yes	.79
8.	16	6	10	Yes	.47
9.	22	16	6	Yes	.78
10.	20	16	4	Yes	.77
11.	24	18	6	Yes	.85
12.	16	13	3	Yes	.57
13.	17	13	4	Yes	.59
14.	21	10	11	Yes	.63
15.	25	23	2	Yes	.95
16.	17	9	8	Yes	.48
17.	23	13	10	Yes	.72
18.	19	16	3	Yes	.74
19.	13	15	-2	No	.58
20.	3	2	1	Yes	.13
21.	24	19	5	Yes	.87
22.	19	17	2	Yes	.80
23.	18	13	5	Yes	.48
24.	21	10	11	Yes	.65
25.	24	16	8	Yes	.82
26.	16	16	0	Yes	.72
27.	24	17	7	Yes	.84
28.	14	15	-1	No	.59
29.	23	18	5	Yes	.82
30.	25	24	1	Yes	.96
31.	22	19	3	Yes	.87
32.	21	16	5	Yes	.82
33.	1	3	-2	No	.07

	Number of Rights in High Group	Number of Rights in Low Group	Number of Discriminations	Good Item	Item Difficulty
34.	19	4	15	Yes	.56
35.	22	21	1	Yes	.87
36.	21	18	3	Yes	.85
37.	13	1	12	Yes	.33
38.	23	17	6	Yes	.81
39.	22	19	3	Yes	.86
40.	24	21	3	Yes	.93
41.	25	21	4	Yes	.95
42.	13	2	11	Yes	.20
43.	20	12	8	Yes	.64
44.	23	12	11	Yes	.68
45.	21	18	3	Yes	.86
46.	24	17	7	Yes	.83
47.	20	20	0	Yes	.77
48.	17	11	6	Yes	.57
49.	39	17	22	Yes	.79
50.	48	22	26	Yes	.93

APPENDIX C

RESULTS OF ITEM ANALYSIS OF POSTTEST

	No. of High Group Rights	No. of low Group Rights	No. of Discriminations	Good Item?	Item Difficulty
1.	37	27	10	Yes	.81
2.	36	23	13	Yes	.73
3.	29	13	16	Yes	.53
4.	29	12	17	Yes	.51
5.	31	22	9	Yes	.71
6.	40	37	13	Yes	.96
7.	32	11	21	Yes	.58
8.	22	11	11	Yes	.40
9.	36	24	12	Yes	.77
10.	7	6	1	Yes	.15
11.	30	15	15	Yes	.58
12.	32	28	4	Yes	.71
13.	34	24	10	Yes	.71
14.	11	5	6	Yes	.21
15.	39	33	6	Yes	.91
16.	25	9	16	Yes	.44
17.	30	21	9	Yes	.69
18.	25	24	1	Yes	.61
19.	34	29	5	Yes	.82
20.	8	2	6	Yes	.13
21.	38	30	8	Yes	.84
22.	37	34	3	Yes	.84
23.	26	20	6	Yes	.59
24.	34	29	5	Yes	.78
25.	38	30	8	Yes	.86
26.	34	33	1	Yes	.86
27.	35	25	10	Yes	.78
28.	35	27	8	Yes	.76
29.	34	31	3	Yes	.78
30.	25	15	10	Yes	.51
31.	35	33	2	Yes	.84
32.	36	27	9	Yes	.79
33.	30	16	14	Yes	.60
34.	22	20	2	Yes	.54

APPENDIX C

RESULTS OF ITEM ANALYSIS OF POSTTEST

	No. of High Group Rights	No. of low Group Rights	No. of Dis-criminations	Good Item?	Item Difficulty
1.	37	27	10	Yes	.81
2.	36	23	13	Yes	.73
3.	29	13	16	Yes	.53
4.	29	12	17	Yes	.51
5.	31	22	9	Yes	.71
6.	40	37	13	Yes	.96
7.	32	11	21	Yes	.58
8.	22	11	11	Yes	.40
9.	36	24	12	Yes	.77
10.	7	6	1	Yes	.15
11.	30	15	15	Yes	.58
12.	32	28	4	Yes	.71
13.	34	24	10	Yes	.71
14.	11	5	6	Yes	.21
15.	39	33	6	Yes	.91
16.	25	9	16	Yes	.44
17.	30	21	9	Yes	.69
18.	25	24	1	Yes	.61
19.	34	29	5	Yes	.82
20.	8	2	6	Yes	.13
21.	38	30	8	Yes	.84
22.	37	34	3	Yes	.84
23.	26	20	6	Yes	.59
24.	34	29	5	Yes	.78
25.	38	30	8	Yes	.86
26.	34	33	1	Yes	.86
27.	35	25	10	Yes	.78
28.	35	27	8	Yes	.76
29.	34	31	3	Yes	.78
30.	25	15	10	Yes	.51
31.	35	33	2	Yes	.84
32.	36	27	9	Yes	.79
33.	30	16	14	Yes	.60
34.	22	20	2	Yes	.54

	No. of High Group Rights	No. of low Group Rights	No. of Discriminations	Good Item?	Item Difficulty
35.	35	38	-3	No	.91
36.	37	28	9	Yes	.73
37.	24	23	1	Yes	.54
38.	33	29	4	Yes	.77
39.	38	35	3	Yes	.89
40.	23	11	12	Yes	.40
41.	17	11	6	Yes	.39
42.	15	14	1	Yes	.34
43.	20	9	11	Yes	.30
44.	32	28	4	Yes	.69
45.	38	37	1	Yes	.92
46.	27	12	15	Yes	.46
47.	38	35	3	Yes	.91
48.	19	22	-3	No	.46
49.	33	23	10	Yes	.73
50.	1	5	-4	No	.08

APPENDIX D

RAW SCORES, MEANS, AND STANDARD DEVIATIONS OF CHANGE SCORES BETWEEN PRE- AND POSTTESTS

APPENDIX D

RAW SCORES, MEANS, AND STANDARD DEVIATIONS OF CHANGE SCORES BETWEEN PRE- AND POSTTESTS

Group A (N=39)		Group B (N=82)			Group C (N=26)
12	26	30	8	16	14
16	12	26	32	6	14
22	12	26	8	8	16
4	2	36	32	6	12
8	14	26	10	12	20
24	10	14	14	16	8
14	8	18	12	24	12
8		22	24	14	6
14		38	30	20	12
24		22	16	8	16
22		26	2	14	2
16		30	18	26	18
18		28	24	30	0
28		40	18	24	14
20		30	16	14	16
22		36	26	14	6
22		34	12	14	0
18		28	28	32	6
2		30	32		2
14		6	22		14
12		26	6		10
10		42	28		24
20		8	28		32
36		6	10		20
6		22	34		22
18		26	34		14
8		26	12		
18		24	20		
28		14	18		
12		18	10		
14		14	26		
18		16	16		
Means 15.6923		$\bar{X}$ = 20.9024			$\bar{X}$ = 12.6923
Standard Deviations					
s.d. = 7.4632		s.d.= 9.2717			s.d.= 7.5435