A STUDY TO INVESTIGATE THE RELATIVE EFFECTIVENESS OF TELEVISION AND NON-TELEVISION INSTRUCTIONAL PROCEDURES IN THE FOUNDATIONS OF PHYSICAL EDUCATION COURSE

Thesis for the Degree of M. A.
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Anna Robinson Ganung

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By

Anna Robinson Ganung

AN ABSTRACT OF A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
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Department of Health, Physical Education, and Recreation

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ABSTRACT

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By Anna Robinson Ganung

The Problem

The purpose of this study was to determine the relative effectiveness of television instruction and conventional instruction at the college level for the Foundations of Physical Education course. The areas investigated were student achievement and student attitudes and opinions toward the course and the instructor.

Conclusions

The comparative study of scores on a subject-matter examination earned by students in the TV and Non-TV sections yielded no statistically significant differences in improvement of scores from pre-test to post-test. We conclude, therefore, that students assigned to TV sections perform as well on tests of immediate subject-matter recall as those taught in the conventional manner.

Students in the TV sections tended, in general, to rate the course content somewhat less favorably than did students in

Non-TV sections, on the basis of response to the 40-item Course Rating scale.

On the basis of subjects' overall rating of the course on a 5-point scale from least valuable to most valuable, mean ratings of TV classes were comparable to those of Non-TV classes.

No significant differences were found between the TV and Non-TV groups on specific items relating to subject motivation and interest. It seems reasonable to conclude, therefore, that student motivation and interest in the subject-matter is very little diminished by assignment to a TV section rather than a conventional section. According to their opinion, students were as highly motivated in the TV as in the Non-TV classes. Objections to TV instruction which are founded upon a presumed superiority of conventional instruction for evoking student motivation and interest seem, within the scope of this study, to be groundless.

No significant differences were found between the rating of the instructors by students in TV sections and those taught in the conventional manner.

No significant differences were found for rating of instructors on specific criteria of teacher effectiveness between students in TV and Non-TV classes.

A significant difference was found between the students' rating of instructors. It is recognized that students are not necessarily the best judges of a teacher's effectiveness, and therefore that ratings by students should not be used for the purpose of making inter-instructor comparisons. However, student opinions are important, as they are in an excellent position to appraise instructor effectiveness in meeting their needs and desires.

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CHAPTER I

INTRODUCTION

Television has become one of the most prominent media of mass communication in American culture. Commercial television has done more to influence American culture in the past decade than any other medium of communication. It has also had a tremendous impact on the education of American children.

In recent years there has been increasingly greater utilization of television by schools and colleges for direct classroom instruction.

Purpose of the Study

It is the purpose of this study to determine the relative effectiveness of television instruction and conventional instruction at the college level for the Foundations of Physical Education course. A closely related purpose is to gain information which may aid in improvement of teaching procedures for the Foundations course.

Need for the Study

It is a well known fact that college enrollments are

increasing rapidly and will continue to increase at an alarming rate unless curtailed either by a major war or by the imposition of severe entrance requirements. Along with this fact are two closely related conditions. First, there is every indication of a shortage of well qualified teachers in most subject areas of the curriculum. Second, it is very doubtful if the procurement of additional revenues for the operation of our institutions of higher education will keep pace with growing enrollments.

Public colleges and universities almost certainly will be forced into receiving and instructing larger and larger numbers of students without corresponding increases in financial support and facilities. This condition, in the face of a growing shortage of "good" teachers, will force the lowering of the quality of instruction unless ways can be found for increasing the ratio of students to teachers without compromising instructional standards.

Television may be a partial solution to problems of quantity if data relative to achievement, motivation and interest of students indicate that quality is not diminished.

Significant data exist from other studies of the effectiveness of televised instruction in many subject-matter areas. Most of the studies conducted to date deal primarily

with achievement in the subject-matter area, and there is a continuously increasing amount of data which indicate that televised instruction is as effective, and in some instances more effective than conventional instruction.

No data exist of the effectiveness of televised instruction in the area of physical education in colleges and universities. With expanding enrollments in institutions of higher education, it is imperative that we find ways to teach larger groups more effectively in the subject matter area of physical education.

It is hoped that this study will give some indication of the relative effectiveness of television teaching for the Foundations of Physical Education course, and that it will make some significant contributions which may aid in improvement of teaching procedures for the course.

Definition of Terms

Television class. A section taught by closed-circuit television. Each classroom was equipped with two viewing monitors. Each section also had a viewing-room instructor who was a regular staff member or a senior physical education major student.

Non-television class. A section taught in the conventional manner.

Limitations of the Study

Sample. The study is confined to 177 freshmen women at Michigan State University.

Techniques and Procedures. Differences in viewing room instructors for Television classes were not considered. It is recognized that the effectiveness of the classroom instructor and her attitude toward the experimental procedure may have an influence on the achievement and attitudes of the students.

Attitude questionnaires which have been used at other universities were modified for use in this study without being tested previously. Especially was this true with the Course Content rating scale which was originally set up as a Thurstone-type scale but was used in this study as a simple agree-disagree form.

This is a one-term study with no provision for retention testing.

CHAPTER II

REVIEW OF LITERATURE

Academic Achievement

A majority of the research studies which have been conducted to determine the effectiveness of television instruction have considered primarily achievement in the subject-matter area.

At Pennsylvania State University, studies have been conducted on the relative achievement of students in television and non-television classes in General Psychology, Chemistry, Elementary Business Law, Introductory Sociology, Elementary Meteorology, and Music Appreciation. Carpenter and Greenhill[1] report that there were no statistically significant differences between test scores of television and the non-television groups for each course. Since no significant differences were found, the general conclusion drawn from these experiments was that the students who were

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[1] C. R. Carpenter and L. P. Greenhill, An Investigation of Closed Circuit Television for Teaching University Courses. Instructional Television Research Report Number Two. University Park Pa.: The Division of Academic Research and Services, Pennsylvania State University. Spring, 1958.

taught for a full semester over television learned as much as those who were taught conventionally.

With the intent of gaining accurate information on the effectiveness of both large and small group instruction and of different teaching procedures and course organizations (including TV), an extensive four year study was conducted at Miami University.[2] Studies of subject-matter achievement as a function of section assignment involved comparisons of the scores earned on the objective portions of the final examinations by equated groups of students attending experimental and control sections. It was apparent that, with few exceptions, large group instruction (including TV) was as effective as was small group (conventional) instruction. Achievement defined as the ability to solve problems and to synthesize information was investigated in a number of large (including TV) classes and equated control sections. The results support the general conclusion that the experimental procedures did not lead to reduced proficiency in these areas.

The National Program in the Use of Television in the Public Schools began a nationwide experiment on use of

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[2] F. Glenn Macomber and Laurence Siegel, Final Report of the Experimental Study in Instructional Procedures. Miami University, Oxford, Ohio, January, 1960.

television for classroom instruction in 1957-58 with nearly 40,000 students in more than 200 elementary and secondary schools. The Program entered its fourth year in 1960-61 with close to 200,000 students in nearly 800 schools in fifteen municipal areas and eight regions participating in the Program.[3] There was wide variation among the different school systems in the kind and quality of tests used and in the statistical treatment of the test results. However, results based on comparisons in which the television and control students had been equated on the basis of scholastic aptitude and pre-test score, or in which differences between television and control groups had been taken into account in such a way that legitimate comparisons could be made, show that of 251 comparisons during the first two years of the study, 165 comparisons favored the TV students and eighty-six favored the control students. There were ninety cases where the difference in achievement was statistically significant; in sixty-nine of these the difference was in favor of the TV classes, and in twenty-one it was in favor of the control classes.

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[3] Teaching by Television. A Report from the Ford Foundation and the Fund for the Advancement of Education. New York: Ford Foundation. 1961.

The largest single experiment in the use of classroom television in a school district was launched in the fall of 1956 in Hagerstown, Maryland, county seat of Washington County. Preliminary comparisons favor the television students in several of the subjects considered.[4] In 1960, thirty-six of the fifty Washington County schools, with a total enrollment of 16,500 students, were receiving instruction by closed circuit television.[5]

Many differences favoring TV students have appeared in studies at the elementary and secondary school levels. Kumata[6] states, however, that it should be pointed out that in these studies, TV did not carry the entire load in the class but was used as an augmentation to regular classroom instruction.

Most of the studies report no significant differences when information gain is compared between students taught by television and students taught under face-to-face conditions.

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[4]Washington County Closed Circuit Educational Television Project, Progress Report. Hagerstown, Maryland: Board of Education, 1959.

[5]Teaching by Television. op. cit.

[6]Hideya Kumata, "A Decade of Teaching by Television," The Impact of Educational Television. University of Illinois Press, Urbana, Illinois, 1960. (edited by Wilbur Schram)

Holmes[7] reports that of 281 comparisons concerning information gain and achievement, the overwhelming majority, 246, indicate no substantial difference in the amount of information gain due to variations in Communication conditions.

Because of the implications for the field of physical education, studies of acquisition of psychomotor skills are of particular interest here.

Kanner, et. al.,[8] in two performance tests of map reading and machine gun operation, found that trainees under TV conditions did significantly better than those in the lecture type class.

Pasewark[9] reports that, in a study conducted to determine the effectiveness of televised instruction for beginning typewriting, television students typed significantly faster than conventional students on the timed test at the

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[7]Presley D. Holmes, Jr., Television Research in the Teaching-Learning Process, Wayne State University Division of Broadcasting, Detroit, Michigan. July 1, 1959.

[8]Joseph H. Kanner, Richard P. Runyon, and Otello Desiderato, Television in Army Training: Evaluation of Television in Army Basic Training, Technical Report 14. Washington D. C.: Human Resources Research Office, The George Washington University, November, 1954.

[9]W. R. Pasewark, Teaching Typewriting Through Television. Research Report Number 17, Bureau of Business and Public Service. Michigan State University, October, 1956.

conclusion of the course. They also typed with less mean errors, but this difference was not statistically significant.

Throop, et. al.,[10] found that students under conventional conditions did better than those taught by television with audio feed back, in the operation of machinery. However, students in the television classes had less access to the machinery.

According to Holmes,[11] the results indicate that television students develop psychomotor skills as well as conventionally taught students.

Student Attitudes

Surveying student opinions and attitudes toward televised instruction has become a widespread standard procedure wherever TV projects are conducted. Such surveys have value as a general assessment of the acceptance of the procedures by students, as a means of permitting students to participate in the evaluation of TV, and as

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[10]Joseph F. Throop, Lewis T. Assini, and George W. Boguslavsky, The Effectiveness of Laboratory Instruction in Strength of Materials by Closed-Circuit Television. Troy, New York: Rensselaer Polytechnic Institute, November 8, 1958.

[11]Holmes, op. cit., p. 64.

a way of collecting suggestions about improving TV operations and televised courses.

It is possible that even though no differences of significance were found in learning, nevertheless student attitudes and opinions may weigh for or against the use of instructional television. Strongly unfavorable student attitudes, if present, would represent a serious public relations problem apart from any carry-over from attitudes to achievement.

Carpenter and Greenhill[12] report that a majority of students exposed to TV indicated they thought they were learning "about the same" or a "little less" by television. The lowest final ratings were given by the students in General Chemistry who had had the first semester of lecture demonstrations of this course in the conventional, large class situation and, therefore, probably had a reasonable basis for making the rating. Almost half of the students in chemistry believed that they were learning somewhat less by television. One factor which should be considered is that in this particular course, students indicated that lack of

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[12]Carpenter and Greenhill, op. cit.

color was a distinct disadvantage. It should also be pointed out that because of the nature of the measures, there was no provision in this study for comparable measure of the students not in television sections. Therefore it is not known to what extent course content or the instructors influenced the ratings.

Macomber and Siegel[13] state that students in the TV sections tended, in general, to rate the course content somewhat less favorably than did students in the control sections of the same courses. Ten of the twelve comparisons supported a trend of more favorable attitudes toward the course in the control than in the TV sections. Three of these ten comparisons produced mean differences that were statistically significant. One course, however, produced data contrary to the usual trend. Two of the comparisons made in this course favored TV over conventional instruction.

Holmes[14] states that every study which has sampled student opinion of the Communication conditions found that, when given a choice between "television" and "conventional" conditions, the majority of students show an acceptance of

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[13]Macomber and Siegel, op. cit.

[14]Holmes, op. cit.

television, but a preference for conventional. However, Carpenter and Greenhill[15] point out that responses to questionnaires may not be accurate indicators of real choice behavior.

Analysis of the responses of those who had received presentations under television conditions indicates a greater shift in the positive direction. That is, students' opinion is higher after exposure than it was before exposure to television conditions, and generally higher than those who had not been exposed at all. Evans,[16] Tannenbaum,[17] and Carpenter and Greenhill[18] all reported results of more favorable opinion of students after exposure to television conditions.

Macomber, et. al.,[19] found that most students reported

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[15] Carpenter and Greenhill, op. cit.

[16] Richard I. Evans, "An Examination of Students' Attitudes Toward Television as a Medium of Instruction in a Psychology Course," Journal of Applied Psychology. XL, 1956, p. 32-34.

[17] Percy H. Tannenbaum, Instruction Through Television: An Experimental Study. Urbana, Illinois: Institute of Communications Research, University of Illinois, 1956.

[18] Carpenter and Greenhill, op. cit.

[19] F. G. Macomber, Laurence Siegel, Stephen C. Hathaway, John E. Dome, Experimental Study in Instructional Procedures. Miami University, Oxford, Ohio, October 1, 1957.

that they neither learned as much nor were as attentive during the TV presentation as they had originally anticipated. Furthermore, more students were inclined to favor conventional instruction over TV instruction at the end of the second semester than at the end of the first semester.

Wessel[20] reports that student attitudes toward TV classes in comparison with conventional classes were favorable in two physical education courses, i.e., Foundations of Physical Education and Social Dance.

Motivation and Interest

One of the frequently voiced objections to television teaching procedures is based on the belief that students in TV sections cannot be as well motivated as students in conventional classes. It is often felt that TV instruction, because of the lack of personal contact between student and instructor, diminishes student interest and inhibits the ability of the instructor to arouse a desire in the student for further contact with the subject-matter. The literature does not support this view.

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[20]Janet A. Wessel, Report of the Experimental Procedures in Closed Circuit Television for Teaching University Courses in Physical Education. Michigan State University, East Lansing, Michigan, June, 1962, (Mimeographed)

Carpenter and Greenhill[21] found no consistent trend with respect to rating of the interest of the course relative to conventional instruction.

Macomber and Siegel[22] found that according to their own opinion students were as highly motivated in the TV as in the conventional conditions and that "Objections to the experimental procedures which are founded upon a presumed superiority of conventional instruction for evoking student motivation and interest seem, within the scope of this investigation, to be groundless."[23]

Teacher Rating

It is recognized that students are not necessarily the best judges of a teacher's effectiveness, and therefore that ratings by students should not be used for the purpose of making inter-instructor comparisons. Students do, however, observe their instructors closely and are in an excellent position to appraise instructor effectiveness in

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[21]C. R. Carpenter and L. P. Greenhill, An Investigation of Closed Circuit Television for Teaching University Courses. Instructional Television Research Project Number One. University Park, Pennsylvania, Pennsylvania State University, July 31, 1955.

[22]Macomber and Siegel, op. cit.

[23]Ibid., p. 29.

meeting their needs and desires. Thus any differences that might exist between ratings assigned to the same instructor by his students in the TV and conventional sections would be of considerable consequence.

Carpenter and Greenhill[24] found that, on the basis of the measures used for rejection and acceptance, a teacher was judged to have the same attitude toward students whether he was teaching directly or over television. When students were asked to rate their instructor compared with others they had in different courses, there were some slight differences in responses between students in TV and direct instruction groups. A slightly higher percentage of students in the direct instruction sections gave ratings of average than did students in the TV sections. The latter group tended to give more ratings at the extreme ends of the scale, resulting in a slightly higher percentage of ratings for both "better than average" and "poorer than average" by students in the TV sections.

Macomber and Siegel[25] report data supportive of greater instructor effectiveness, as far as students are

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[24]Carpenter and Greenhill (Research Report No. Two)

[25]Macomber and Siegel, op. cit.

concerned, in conventional than in TV sections. The experimental procedure tended to reduce the instructor's effectiveness, as far as student opinions were concerned. This perceived reduction in teaching effectiveness was not, it should be remembered, paralleled by a corresponding decrement in the performance of students in the TV sections on the various measures of achievement. On specific criteria of teaching effectiveness, Macomber and Siegel[26] report that the students tended to feel that their instructors did a better job of providing individual stimulation and maintaining a high level of interest when they taught conventional sections than when they taught TV sections.

Summary

A major portion of the research which has been conducted regarding the effectiveness of television instruction has been concerned with information gain. The result of an overwhelming majority of studies on subject-matter tests is that no significant difference has been found in comparisons of television students with conventionally taught students.

Surveys of student attitudes have indicated that a majority of students were neutral or mildly negative in their

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[26] Ibid.

reaction toward televised instruction. However, there is no indication that interest and motivation were decreased as a result of receiving instruction through the medium of television.

Students tended to rate effectiveness of instructors about the same or somewhat less in television classes as compared with conventional instructional procedures.

CHAPTER III

METHODOLOGY

Design

This study was conducted with a single variable experimental pattern. The experimental group consisted of three sections of the Foundations of Physical Education course taught by closed circuit television. The control group consisted of three sections conducted in the conventional manner.

Variables. The primary independent variable was presentational technique--television instruction vs. conventional classroom procedures.

The dependent variables considered were:

1. academic achievement
2. student attitudes toward the course
3. student opinions of the instructor

Equating the Control Sections with the Experimental Sections. In order to limit independent variables as nearly as possible to the one under investigation, the experimental and control groups were equated on the following bases:

Instructor. Three instructors were involved in the study. Each of these instructors taught one of the non-television sections and was also the television instructor for one of the television sections.

Place of meeting. The same place of meeting was used for the television and non-television class of each of the instructors involved in the study to insure comparable physical environmental factors.

Length of class period. All sections met for one hour twice a week.

Time of meeting. All sections met during the hours of 1 and 3 p.m.

Course material presented. The course outline was the same for television and non-television classes, and every attempt was made to adhere as closely as possible to this outline to insure comparable instruction for the two groups.

Knowledge of Subject-matter. To avoid effects of prior knowledge of the subject-matter area, a pre-test was administered, in addition to the post-test. The difference between the two scores was the evaluative measure used.

Subjects

The subjects for the study were freshman women students enrolled in the Foundations of Physical Education course at Michigan State University during the 1961 Fall Term.

The randomness of the subjects in the control and the experimental sections is assured because:

1. All freshmen students at Michigan State University were required to enroll in the Foundations of Physical Education course, and all students attending the University were eligible to enroll in the course.

2. All students registered for the course by the standard University procedure which does not permit factors of bias that may distort the randomness of the sections. Approximately 700 instructors, called academic advisors, assisted about 20,000 students to select sections of courses which the University offers.

3. There was no indication in the Schedule of Courses that any of the sections would be taught on television. None of the sections was identified as being related to this study. Students were not informed of the method of instruction until the first class meeting.

Evaluative Instruments

The evaluative design of the study employed criterion measures in the areas of student achievement and student attitudes and opinions.

Measures of Student Achievement. The criterion of achievement employed in this study is the final examination. The final examination for the Foundations of Physical Education course has been developed over a period of three years by the Department of Health, Physical Education, and Recreation. This test is objective in nature and is designed to measure immediate recall of basic facts and statements of principles. The same examination was given as a pre-test during the second class meeting and as a final examination at the conclusion of the course, with differences in pre-test and final scores being the evaluative measure.

Measures of Student Attitudes. Two attitude scales were used for the purpose of measuring student reaction to the course and to the instructor:

Course Rating. The students were required to respond to 40 items related to the course content. The agree-disagree format was employed for this scale. This evaluative instrument was adapted and modified from the C Scale (Course Rating) developed and utilized at Miami

University.[1]

Instructor Rating. Students were required to rate their instructor on each of twenty items related to teaching effectiveness. This instrument was an adaptation and modification of the I Scale (Instructor Rating) which was developed and used at Miami University.[2] The items selected for inclusion in this scale were drawn from a pool of approximately 100 preliminary items. Student judges rated each of the preliminary items in terms of its importance as a determinant of teaching effectiveness. The items contained in the I Scale were those consistently rated as most important.

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[1]Macomber and Siegel, op. cit.

[2]Ibid.

CHAPTER IV

ANALYSIS OF DATA

The specific questions and problems considered in this study are:

1. How did students in the experimental and control sections of the course compare with respect to performance on tests of immediate subject-matter recall?

2. Were student attitudes about the course influenced by assignment to experimental rather than to a control section?

3. Did students report differential levels of motivation and interest as a result of assignment to experimental rather than to control sections?

4. Were student attitudes about the effectiveness of their instructor influenced by assignment to an experimental rather than to a control section?

5. Does instructional procedure have any effect on certain specific criteria of teacher effectiveness?

Evaluation of Student Achievement

The criterion of achievement defined as the acquisition of subject-matter knowledge was the course examination

administered for the purpose of assigning final grades. This test consisted of 100 objective questions. The criterion was directed toward measuring immediate recall of facts and the routine application of fundamental principles. The test was administered, for purposes of obtaining a pre-test score, during the second class meeting. The same examination was given at the conclusion of the course, with differences in pre-test and final scores being used as the evaluative measure.

Data were collected on 87 subjects in the TV group and 91 in the Non-TV group. The statistical technique applied to these data was the analysis of variance formula reported by Walker and Lev.[1] The level of significance selected was the .05 level. The results of the analysis of variance are presented in Table I.

TABLE I

ANALYSIS OF VARIANCE FOR ACHIEVEMENT SCORES

Source	S.S.	D.F.	M.S.	F.	Probability
Methods	.841	1	.841	.1265	.27
Instructors	9.238	2	4.619	.695	.50
Interaction	9.781	2	4.89	.736	.55
Error	1143.244	172	6.6468		
Total		177			

[1]Helen M. Walker and Joseph Lev, Statistical Inference. New York: Henry Holt and Company, 1953, p. 381.

Two null hypotheses were tested: (1) There is no difference between the mean improvement scores of subjects in the TV classes and the Non-TV classes. (2) There is no difference in mean improvement scores among the subjects by virtue of instructor assignment. The null hypotheses were held tenable since the F values obtained were too small to be significant.

These findings are in harmony with results of a majority of studies on information gain.

Evaluation of Student Attitudes

Comparison of Student Attitudes Toward the Course. The purpose of this investigation was to determine whether or not a differential pattern of attitude toward course content as measured by the course rating scale existed between experimental and control sections. The scale was administered to all students in the experimental and control sections at the end of the term.

The statistical technique applied to this data was the binomial test using Z to test the hypothesis that there is no difference in proportion of favorable responses between TV and Non-TV classes.

The null hypothesis was rejected. The observed differences in proportions was significant at the .01

level, the proportion of favorable responses being higher in the Non-television group. Students in the television sections tended, in general, to rate the course content somewhat less favorably than did students in the control sections on the basis of response to the 40-item Course Rating scale. This finding is similar to that reported by Macomber and Siegel.[2]

The responses to the Course Rating scale are summarized in Table II.

TABLE II

STUDENT RESPONSES TO 40-ITEM COURSE RATING SCALE

	Television		Non-television	
	Number	Per cent	Number	Per cent
Favorable	2015	57.9	2273	62.6
Unfavorable	1463	42.1	1356	37.4
Total	3478	100.0	3629	100.0

Student ratings of the course were obtained on a five-point rating scale for the one question listed below:

> Find the one point on the scale below which comes closest to representing your overall evaluation of this course. Then fill in the corresponding space to number 41 on the IBM answer sheet.

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[2]Macomber and Siegel, op. cit.

A. Really a topnotch course. If I had it to do over again, I would go out of my way to take the course.

B. A better than average course. I feel I got more out of it than many others I have taken or will take.

C. An average course. I feel I got about as much out of the course as I do from most courses I take.

D. A poor course. I feel I got less out of it than many others I have taken or will take.

E. A very inferior course. It I had it to do over again (and had a choice), I would try to avoid this course. I got hardly anything out of it.

The responses on each rating for the TV and Non-TV groups are reported in Table III.

TABLE III

RESPONSES TO OVER-ALL RATING OF COURSE

	Television		Non-Television	
	Number	Per cent	Number	Per cent
A. Really a top-notch course	2	2.4	4	4.7
B. A better than average course	29	34.9	26	30.2
C. An average course	37	44.6	37	43.0
D. A poor course	13	15.7	16	18.6
E. A very inferior course	2	2.4	3	3.5
Total	83	100.0	86	100.0

The responses were scored on a 5-point scale, and the t-ratio was the statistic applied to test for differences in the mean rating by students in the TV and Non-TV classes. There was no significant difference at the .05 level. This finding supports the hypothesis that there is no difference in students' mean ratings of television classes and non-television classes.

The findings on student attitudes toward the course appear to be in conflict, since responses to specific items related to course content indicated a more favorable attitude on the part of students toward conventional instruction, but responses to the single question concerning over-all rating of the course showed no significant difference between TV and Non-TV sections. It is possible that if responses to the specific items in the course rating scale had been rated on a Thurstone-type scale, the findings might have been more consistent.

Student motivation and interest in the course. One of the frequently voiced objections to TV teaching procedures is based upon the belief that students in TV sections cannot be as well motivated as students in conventional classes. It is often felt that TV instruction, because of lack of personal contact between student and instructor, diminishes student

interest and inhibits the instructor's ability to whet students' appetites for further contacts with the subject-matter area.

The course rating scale contains several items which relate specifically to this matter of subject motivation and interest. Five of these items, with which students were asked either to agree or disagree are:

2. As a result of this course I have been stimulated to do a good deal of additional reading in the subject matter (aside from class assignments).

12. I frequently looked for an excuse to miss one of these classes.

15. Even if I have the chance in the future, I will avoid having anything further to do with this subject.

26. This course did not whet my interest in the subject-matter.

31. This class is responsible for making me consider a vocation in the subject-area.

On these items, no statistically significant differences were found between responses of the television and Non-television groups at the .05 level of confidence. This finding is similar to that reported by Macomber and Siegel.[3] The responses for the two groups are reported in Table IV, on page 31.

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[3] Macomber and Siegel, op. cit.

TABLE IV

RESPONSES ON ITEMS RELATING TO MOTIVATION AND INTEREST

	Item 2		Item 12		Item 15		Item 26		Item 31	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Television	5	86	8	82	10	81	31	59	10	82
Non-Television	4	83	9	79	15	73	38	49	7	80

Attitudes toward Instructor. Student ratings of instructor effectiveness were obtained on the Instructor Rating Form described in Chapter III. This scale yields scores ranging from 1 (much more effective than the typical instructor) to 5 (much less effective than the typical instructor). The scale was administered at the end of the term.

Analysis of variance was the statistical technique applied to these data. The .05 level of significance was selected for this study. The results of the analysis of variance are presented in Table V, on page 32.

No significant differences were found between instructor ratings assigned by students in the TV and Non-TV sections. This finding conflicts with the results of the study reported by Macomber and Siegel[4] in which essentially the same rating

[4] Ibid.

TABLE V

ANALYSIS OF VARIANCE FOR INSTRUCTOR RATING

Source	S.S.	D.F.	M.S.	F.	Probability
Instructors	747	2	373.5	4.42	.987
Methods	16	1	16	.19	.30
Interaction	232	2	116	1.37	.75
Sub-total	995	5	199		
Within	14204	168	84.5		
Total	15199	173	87.9		

form was used. A possible explanation for this finding might be the greater number of students involved in the study reported by these authors.

A significant difference was found between the students' ratings of instructors. This difference was significant at the .02 level. This was not an unexpected finding, since students differ in their opinions of instructors. However, it should be pointed out that students are not necessarily the best judges of instructor effectiveness, and therefore ratings by students should not be used for the purpose of making inter-instructor comparisons.

Effect of instructional procedure upon specific criteria of teaching effectiveness. There are often so-called

"intangible" benefits presumed to be inherent in conventional classroom teaching. Many teachers feel that they are better able to pace their presentations, and to maintain student interest, through the conventional classroom procedure. Consequently the following specific items were extracted from the Instructor Rating form for further study:

5. Gives well organized presentations.
6. Makes major points clear.
7. Enthusiastic in her teaching.
8. Unifies the subject in her presentations.
12. Makes sure students understand difficult points.
13. Paces presentations properly in speed and content to students' comprehension.

The students were required to rate their teacher with respect to each item along a 5-point continuum ranging from 1 (outstanding with reference to this item) to 5 (among the very worst teachers with respect to this item). The percentages of favorable (1 and 2) ratings given to each instructor on these items by the students in her TV and Non-TV sections are summarized in Table VI. No statistically significant percentage differences were found at the .05 level of confidence between the TV and Non-TV groups.

This finding is contrary to that reported by Macomber

and Siegel.[5] Difference in number of subjects may be a possible explanation for this conflict in findings.

TABLE VI

FAVORABLE RESPONSES ON SPECIFIC CRITERIA OF TEACHER EFFECTIVENESS

Item	5		6		7		8		12		13	
Instructor	TV	NTV	TV	NTV	TV	NTV	TV	NTV	TV	NTV	TV	NTV
A No.	28	23	28	26	28	29	27	23	24	25	27	23
Percent	97	79	97	90	97	100	93	79	83	86	93	79
B No.	20	20	21	20	25	28	20	22	16	20	17	22
Percent	69	69	72	69	86	97	68	76	55	69	59	76
C No.	28	26	28	26	28	29	26	27	24	28	26	24
Percent	97	90	97	90	97	100	90	93	83	97	90	83
Total No.	76	69	77	72	81	86	73	72	64	73	70	69
Percent	87	79	89	83	93	99	84	83	74	84	80	79

[5] Ibid.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the relative effectiveness of television instruction and conventional instruction at the college level for the Foundations of Physical Education Course. The areas investigated were student achievement and student attitudes and opinions toward the course and the instructor.

Conclusions

The comparative study of scores on a subject-matter examination earned by students in the TV and Non-TV sections yielded no statistically significant differences in improvement of scores from pre-test to post-test. We conclude, therefore, that students assigned to TV sections perform as well on tests of immediate subject-matter recall as those taught in the conventional manner.

Students in the TV sections tended, in general, to rate the course content somewhat less favorably than did students in Non-TV sections, on the basis of response to the

40-item Course Rating Scale.

On the basis of subjects' overall rating of the course on a 5-point scale from least valuable to most valuable, no significant difference was found between mean ratings of TV classes and Non-TV classes.

No significant differences were found between the TV and Non-TV groups on specific items relating to subject motivation and interest. It seems reasonable to conclude, therefore, that student motivation and interest in the subject-matter is very little diminished by assignment to a TV section rather than a conventional section. According to their opinion, students were as highly motivated in the TV as in the Non-TV classes. Objections to TV instruction which are founded upon a presumed superiority of conventional instruction for evoking student motivation and interest seem, within the scope of this study, to be groundless.

No significant differences were found between the rating of the instructors by students in TV sections and those taught in the conventional manner.

No significant differences were found for rating of instructors on specific criteria of teacher effectiveness between students in TV and Non-TV classes.

A significant difference was found between the students'

rating of instructors. It is recognized that students are not necessarily the best judges of a teacher's effectiveness, and therefore that ratings by students should not be used for the purpose of making inter-instructor comparisons. However, student opinions are important, as they are in an excellent position to appraise instructor effectiveness in meeting their needs and desires.

Recommendations

A study should be made to determine the phases of the Foundations of Physical Education course which can best be presented through the medium of television.

There should be further investigation as to the effect of television on motivation for activity, and on learning and performance of physical skills.

A longitudinal study should be conducted to determine the retention of concepts presented in the Foundations of Physical Education course, and the subsequent attitudes and activity patterns of students who have participated in the course.

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APPENDICES

APPENDIX A

RAW DATA ON ACHIEVEMENT TESTS AND ATTITUDE SCALES

TABLE VII

RAW DATA ON ACHIEVEMENT EXAMINATION

Television Sections			Non-television Sections		
Pre-test	Final	Difference	Pre-test	Final	Difference
Instructor A			Instructor A		
64	76	12	41	71	30
56	68	12	51	89	38
49	72	23	52	75	23
47	71	24	63	83	20
59	73	14	42	74	32
40	74	34	49	62	13
37	73	36	59	75	16
40	87	47	55	63	8
43	97	54	29	54	25
52	86	34	42	68	26
47	75	28	51	74	23
51	64	13	45	61	16
46	75	29	56	67	11
52	83	31	33	61	28
41	77	36	47	70	23
40	60	20	56	83	27
57	88	31	46	82	36
44	67	23	57	85	28
41	71	30	38	86	48
47	77	30	53	73	20
62	79	17	46	69	23
44	66	22	50	79	29
41	59	18	45	88	43
38	57	19	54	74	20
58	81	23	57	83	26
59	79	20	50	70	20
47	87	40	53	67	14
37	94	57	43	68	25
			44	77	33
			38	52	14
			44	64	20

TABLE VII (Continued)

Television Sections			Non-television Sections		
Pre-test	Final	Difference	Pre-test	Final	Difference
Instructor B			Instructor B		
56	80	24	46	73	27
44	58	14	43	89	46
48	79	31	44	69	25
53	83	30	62	88	26
51	71	20	49	67	18
45	75	30	43	56	13
50	76	26	52	89	37
45	74	29	37	81	44
45	53	8	45	91	46
40	65	25	39	67	28
54	67	13	66	91	25
53	65	12	42	66	24
45	71	26	53	91	38
49	71	22	47	83	36
51	75	24	54	73	19
48	70	22	58	74	16
46	66	20	55	85	30
36	55	19	49	79	30
40	67	27	46	84	38
49	77	28	49	75	26
36	60	24	57	88	31
40	88	48	46	73	27
60	82	22	38	97	59
44	67	23	36	84	48
36	58	22	50	83	33
46	67	21	42	71	29
34	63	29	48	55	7
46	69	23	40	74	34
52	76	24	44	67	23

TABLE VII (Continued)

Television Sections			Non-Television Sections		
Pre-test	Final	Difference	Pre-test	Final	Difference
Instructor C			Instructor C		
46	81	35	35	53	18
59	83	24	41	84	43
41	76	35	47	65	18
68	79	11	40	65	25
42	69	27	45	91	46
46	63	17	42	78	36
44	77	33	52	77	25
25	51	26	39	80	41
44	76	32	43	52	9
57	78	21	32	76	44
41	65	24	46	84	38
31	93	62	47	78	31
45	80	35	53	59	6
54	85	31	60	81	21
47	76	29	46	78	32
40	69	29	48	78	30
48	71	23	54	70	16
61	88	27	45	74	29
40	56	16	54	87	33
49	76	27	50	82	32
46	77	31	51	74	23
46	74	28	51	79	28
58	90	32	54	86	32
33	70	37	49	70	21
37	87	50	56	85	29
38	63	25	62	89	27
49	71	22	42	67	25
50	92	42	47	68	21
50	71	21	35	73	38
41	80	39	39	74	35
			57	87	30

TABLE VIII

RAW DATA ON FAVORABLE RESPONSES TO 40-ITEM COURSE CONTENT ATTITUDE SCALE

Instructor A		Instructor B		Instructor C	
TV	NTV	TV	NTV	TV	NTV
33	33	23	12	32	29
35	23	33	31	18	33
13	28	20	31	36	25
13	22	29	23	24	31
27	12	13	27	26	32
29	8	13	9	26	23
27	33	20	26	13	19
32	32	29	20	25	34
21	12	25	21	16	32
19	30	13	15	20	23
11	36	9	27	20	35
17	29	24	30	22	32
30	34	16	15	25	15
30	31	32	27	19	32
24	20	30	29	16	21
28	33	22	14	34	31
15	28	18	22	20	21
28	28	27	31	23	23
23	37	12	19	17	22
11	32	22	25	27	29
27	13	20	18	31	11
30	30	15	14	26	31
20	32	22	28	34	30
15	19	11	20	24	26
27	32	32	34	31	30
22	18	9	15	26	32
20	28	30	10	35	23
21	17	28	33	35	18
	27	16	22	16	22
	32			27	18
	34				19

TABLE IX

RAW DATA ON 20-ITEM INSTRUCTOR RATING SCALE

Instructor A		Instructor B		Instructor C	
TV	NTV	TV	NTV	TV	NTV
43 (2)	43	32	52	30	30
23	33	40	43	40	44
43	36	46	28	36	32
41	47	54	20	43	45
26	34	45	32	41	31
38	32	38	31	35	23
29	25	41	25	39	34
39	25	44	35	46	37
30	24	48	65	39	37
33	43	34	31	29	37
26	57	38	37	43	41
26	57	50	55	42	39
24	39	22	50	42	26
26	29	44	29	35	39
40	31	24	44	29	33
23	48	44	33	45	43
32	43	46	50	39	38
45	43	48	64	35	42
33	44	25	39	41	32
24	30	28	34	26	37
53	35	29	22	51	41
41	58	49	39	44	37
25	26	57	58	39	47
33	25	53	40	24	22
57	35	31	44	32	38
34	31	59	44	45	35
34	26	43	40	34	26
27	36	41	30	43	29
48	34	36	42	44	20

APPENDIX B

ATTITUDE AND RATING SCALES

ATTITUDE TOWARDS COURSE CONTENT

The Department of Health and Physical Education at Michigan State University is engaged in an investigation of the effectiveness of a variety of instructional procedures and techniques. One aspect of the overall program concerns student's reactions to course content.

You have received a special answer sheet on which you are to mark your answers. Although you are asked to identify yourself on the answer sheet, please be assured that your replies will have no bearing at all upon your grade in this course. All replies will be treated with complete confidence.

PART I

Read each of the following statements and decide whether or not you agree with it. If the statement represents your own attitude, blacken the space between the dotted lines labeled A (agree) on the special answer sheet. If you disagree with the statement, fill in the B column on the special answer sheet.

Please consider every statement carefully and mark your reaction to each in either the A (agree) or B (disagree) column. Do not omit any items.

1. I was stimulated to do the class assignments prior to each class meeting.
2. As a result of this course I have been stimulated to do a good deal of additional reading in the subject matter (aside from class assignments).
3. I hardly ever prepared for class meetings by reading over my notes, keeping up with the text assignments, etc.
4. This class was about as stimulating as most of the others I have taken.
5. I could generally see a plan of organization of content in effect throughout the conduct of the course.
6. The content of this course might best be described as "much ado about nothing."
7. I feel that if I had not taken this course there would be a large gap in my fund of knowledge.
8. I would recommend that other students not necessarily avoid this course, but not go out of their way to take it either.
9. I rarely was stimulated to discuss the content of this course with anyone outside of class hours.
10. The classroom presentations tended to repeat the textbook material without contributing any new knowledge or ideas.
11. The classroom presentations supplimented the textbook by contributing informative side-lights.
12. I frequently looked for an excuse to miss one of these classes.
13. This course pretty much rehashed material which I had learned previously.
14. This course has covered material which, for the most part, I consider to be vital and significant.
15. Even if I have the chance in the future, I will avoid having anything further to do with this subject.

16. I frequently found myself wanting to discuss what I had learned in class with friends.

17. I generally felt quite relaxed in this course.

18. When I sat down to study I found that I generally preferred studying material for another couse rather than this one.

19. I was often sorry to hear the bell ring ending the class period.

20. This course contributed very little to my fund of knowledge.

21. This course has stimulated me to think.

22. Although this course did contribute to my fund of general knowledge, it was not as valuable in this respect as I hoped it would be.

23. If I have the chance in the future, I will most certainly want to learn more about the subject matter.

24. I would recommend that as many students as possible take this course.

25. I did little in the way of original thinking about the subject-matter of this course.

26. This course did not whet my interest in the subject-matter.

27. This course has contributed little toward giving me a broader understanding of the subject-matter.

28. I do the assignments for this class somewhat more thoroughly than the assignments in many of my other courses.

29. Sometimes I had glimmers of an overall organization of course content while at other times I felt that the course was moving in all directions at once.

30. This class has definitely influenced my philosophies and attitudes.

31. This class is responsible for making me consider a vocation in the subject-area.

32. I am not interested in remembering any of the content of this course beyond the final examination.

33. I will be able to use some of the facts and concepts we covered, but a large portion of the course content is just "dead wood".

34. I wish I could have avoided taking this course.

35. I generally had the feeling that we were getting somwhere in this course; it kept moving ahead at a steady pace.

36. We covered most of the material in sufficient detail.

37. I would recommend that as many students as possible avoid taking this course.

38. I frequently feel tense and uncomfortable because of the pressures in this class.

39. I would be somewhat disappointed if I had to miss any of these classes.

40. I consider my preparation (textbook reading, studying notes, etc.) for this

PART II

41. Find the one point on the scale below which comes closest to representing your overall evaluation of this course. Then fill in the corresponding space to number 41 on the IBM answer sheet.

    A. Really a topnotch course. If I had it to do over again, I would go out of my way to take the course.

    B. A better than average course. I feel I got more out of it than many others I have taken or will take.

    C. An average course. I feel I got about as much out of the course as I do from most courses I take.

    D. A poor course. I feel I got less out of it than many others I have taken or will take.

    E. A very inferior course. If I had it to do over again (and had a choice), I would try to avoid this course. I got hardly anything out of it.

PART III

COMMENTS

Please write any comments about the content of this course on the separate sheet provided.

RATING SCALE FOR COLLEGE TEACHERS

The Department of Health and Physical Education at Michigan State University is engaged in an investigation of the effectiveness of a variety of instructional procedures and techniques. One aspect of the overall program concerns students' ratings of instructors.

Although you are requested to identify your self on the IBM answer sheet, please be assured that your replies will have no bearing at all upon your grade in this course. Furthermore, your replies will have neither a favorable nor an adverse effect upon your instructor. All replies will be treated with complete confidence.

PART I

You are to describe or rate your instructor in relation to each of the 20 items listed on the next page. Consider each item with respect to the following scale:

1 means outstanding; the teacher is among the very best you have ever known with reference to the item.

2 means good; the teacher is above the average of teachers you have known with reference to the item.

3 means average

4 means poor; the teacher is below the average of teachers you have known with reference to the item

5 means worst; the teacher is among the very worst you have ever known with reference to the item.

Indicate your rating for each item by filling in the appropriate space on your IBM answer sheet. Do not omit any items.

PART I

1. Conducts classes in an assured, confident manner.
2. Usually relaxed rather than tense.
3. Has calm, even temperament.
4. Has effective vocabulary.
5. Gives well organized presentations
6. Makes major points clear.
7. Enthusiastic in her teaching.
8. Unifies the subject in her presentations.
9. Uses relevant supporting details
10. Uses questions skillfully to clarify or define problems under discussion.
11. Has easy, yet forceful personality.
12. Makes sure students understand difficult points.
13. Paces presentations properly in speed and content to students' comprehension.
14. Holds the interest of more than just the brightest pupils.
15. Inspires you to make the maximum preparation for each day's assignment in her class.
16. Analyzes probelms clearly.
17. Teaches so that student's out-of-class interest is aroused.
18. Makes assignments challenging and valuable.
19. Makes laboratory work meaningful rather than routine.
20. Encourages initiative on part of students.

PART II

21. Find the one point on the scale below which comes closest to representing your overall evaluation of your instructor. Than fill in the corresponding space next to number 21 on the IBM answer sheet.

Rank 1 A. One of the very best teachers I have known or expect to know. I would go out of my way to take another course from her.

2 B. A superior teacher.

3 C. An average teacher; neither better nor worse than most other teachers.

4 D. An inferior teacher.

5 E. One of the worst teachers I have ever known or expect to know. If possible, I would really go out of my way to avoid taking another course from her.

PART III

Please write any additional comments about your instructor on the separate sheet provided for this purpose.