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GRADUATE COLLEGE

A COMPARATIVE ANALYSIS OF ATTITUDES OF STUDENTS TAUGHT INTRODUCTORY COLLEGE GEOGRAPHY BY CLOSED-CIRCUIT TELEVISION AND THE CLASSROOM-DISCUSSION METHOD

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JOE Ventor SIMS

Norman, Oklahoma

1968

A COMPARATIVE ANALYSIS OF ATTITUDES OF STUDENTS

TAUGHT INTRODUCTORY COLLEGE GEOGRAPHY BY

CLOSED-CIRCUIT TELEVISION AND THE

CLASSROOM-DISCUSSION METHOD

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This dissertation is dedicated to my wife, June; daughters, Jana and Joni; and son, Joel. Their years of sacrifice made the completion of this program a reality.

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A COMPARATIVE ANALYSIS OF ATTITUDES OF STUDENTS TAUGHT INTRODUCTORY COLLEGE GEOGRAPHY BY CLOSED-CIRCUIT TELEVISION AND THE CLASSROOM DISCUSSION METHOD

CHAPTER I

INTRODUCTION

Background of the Study

The impact of televised teaching had become apparent to thoughtful educators by the mid-1950's. As early as 1957 Stoddard reported, "Judging from what has already been done, it is quite likely that the use of television for direct teaching at the college level will grow rapidly." His growth prediction has certainly proved to be true. He continued, "It already seems to be a fact that teaching at the college level can use television effectively and that much larger classes, both on and off campus, may be in prospect. Even more profound changes may be in the offing, as colleges probe the potentialities of this means of communication."[1]

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[1]Alexander J. Stoddard, Schools for Tomorrow: An Educational Blueprint (New York: Fund for the Advancement of Education, 1957), p. 36.

In the decade since, the use of educational television has expanded greatly. Kelley declared in a 1965 report, "Literally thousands of elementary and secondary schools, and hundreds of colleges and universities have, in some manner or other, incorporated television into their educational programs as a way to graphically present part of the instructional load."[2] A University of California study in 1965 cited seventeen institutions of higher learning with enrollments of over 20,000 students which employ some form of instructional television (ITV).[3] A dramatic use of ITV is at Chicago Junior College where the entire course offerings are available on television and can be picked up by home receivers.

Along with this expansion there has been the need for research on the effects of televised instruction. Effectiveness has been examined in many studies and is almost synonomous with achievement since practically all of the studies compare student achievement at the beginning and end of the course.[4] These studies have dealt mainly with comparing effectiveness levels in ITV with the traditional classroom-

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[2]C. Fred Kelley, "ETV -- Today and Tomorrow," American School and University, XXXVII (August, 1965), p. 24.

[3]Ibid., p. 25.

[4]Leslie P. Greenhill, "Review of Trends in Research on Instructional Television and Film," Research in Instructional Television and Film (Washington, D. C.: Office of Education, 1967), p. 4.

discussion method of instruction, although some studies have simply analyzed the ITV method.

Stickell examined some 250 comparative studies and found that most indicated no significant difference in the two methods of instruction at the 0.05 level of confidence.[5] These comparative studies ranged from the elementary school level through higher education and encompassed most fields of study--social science, physical sciences, biological sciences, mathematics, speech, foreign languages, and many others. One comparative study dealing with achievement was done by Johnson at Macalaster College in relation to introductory college geography taught by open-circuit educational television.[6] A similar comparative study was conducted at Los Angeles with many disciplines including geography and the results indicated no significant difference in the results attained between the two methods of teaching.[7]

Many interested educators and researchers are disappointed because most studies show no significant difference in student achievement between television

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[5]D. W. Stickell, A Critical Review of the Methodology and Results of Research Comparing Televised and Face-to-Face Instruction, Doctoral Dissertation (Pennsylvania State University, 1963), pp. 65-66.

[6]Hildegard Johnson, A Comparative Study of an Introductory Geography Course on ETV and in the Classroom (Saint Paul: Macalaster College, 1960).

[7]Los Angeles City School Districts, "An Evaluation of Closed-Circuit Television for Teaching Junior College Courses," Audio-Visual Communication Review (1958).

instruction and the classroom-discussion method of teaching. An Office of Education publication[8] states that this very fact should give educational administrators some confidence that several alternative methods of instruction are available for use. This allows them to choose the teaching method which seems to be best in their own particular situation without basing the decision entirely on the relative effectiveness of different teaching methods.

Fewer studies have been done on assessing the attitudes of students in relation to television as a method of instruction, but the trend is toward such research.[9] Some research on attitudes was included in the relative effectiveness studies previously mentioned, but no studies were found that related solely to attitudes of students taking geography by ITV. Greenhill speculates on the reasons for this trend: "Perhaps it is because television appears to threaten the position of the classroom teacher, or is perceived as a technological device which will take the human element out of teaching and will perhaps result in less effective learning."[10]

The results of research on attitudes vary greatly. It is impossible to determine the trend of student attitudes toward televised instruction at this time since in some

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[8] Greenhill, loc. cit.

[9] Ibid., p. 4.

[10] Ibid., p. 11.

situations one finds negative attitudes, in others positive attitudes, and in many studies attitudes that are neutral. Student attitudes often reflect the attitude of the instructor and/or the quality of the instruction received by this method and not the method itself.

Many methods have been utilized in attempting to determine student attitudes toward different methods of instruction. Simple questionnaires are used which ask what the student thinks about specified aspects of televised or classroom instruction. Some researchers simple ask students to "size-up" a particular method of instruction on the basis of several criteria, then compare this with another method of instruction that has also been "sized-up" in s similar manner. A more structured instrument, the semantic differential, has been used successfully in studies of attitudes, and a modified semantic differentail instrument was used for this study.

ITV and Geography at East Central State College

Many students at East Central State College take introductory college geography, entitled Elements of Human Geography, Geography 103. It is a one semester, three-hour lecture course which meets three hours per week. It is designed primarily as a course for freshmen, but others can and do take the course.

During the 1966-1967 academic year some 723 students took the course, and in the 1967-1968 school year approximately

750 students completed the course. These numbers indicate that approximately twenty-five per cent of the total student body take Elements of Human Geography each year.

Geography 103 is one of the courses used to meet the general education requirement for graduation at East Central State College in the curriculum in Arts and Science and also in the curriculum in Teacher Education. The requirement in the Arts and Sciences curriculum states: "Economics, geography, sociology: one course in each of two of the fields, 4-6 hours." This is stated exactly the same in the curriculum in Teacher Education with the additional statement, "Geography 103, 123, or 453 required for major in Elementary Education."[11] The course is required for a major in geography in the Arts and Science curriculum and is also required for a Social Studies minor who is emphasizing geography in the Teacher Education curriculum. The course is a prerequisite for most of the advanced courses in geography.

In the fall semester of the academic year 1965-1966, East Central State College began offering certain selected courses by closed-circuit television. The introductory geography course, Geography 103, and History 113, Modern Western Civilization, were the first courses taught by this method. During the spring semester of the same year, Sociology

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[11]East Central State College, General Catalog 1968-70 (Ada, Oklahoma, April, 1968), p. 57.

203, Introductory Sociology, became the third course offered by this method of instruction.

The primary reason for offering introductory courses by closed-circuit television is to help alleviate the perrennial problem of an unfavorable teacher-student ratio at the freshman level where many introductory required courses are taught. Geography 103 has been taught six semesters by CCTV to 726 students, an average of 121 students per semester. History 113 has been taught the same number of semesters to a total of 888 students for an average of 143 per semester. Sociology 203 has been taught five semesters to 610 students with 122 an average for each semester. The courses are not offered by television during the summer.

The originating room for ITV at East Central State College will accommodate 40 students, and the three receiving rooms will seat approximately 45 students each. The broadcasting room was formerly a regular classroom with all the standard equipment usually found therein. In addition there is a special type of blackboard which is used to portray written information, and an easel is available to facilitate the display of posters, maps, and charts. An artist works with the television professor to produce graphics as regular classroom maps do not project well on television. The rear of the room has been partitioned-off to make a control area for the cameras, the cameramen, and the director. Both of the cameramen and the director are employed at the local television

station, and their only responsibility here is to make a good clear picture that projects well in the receiving rooms. The cameras used are the industrial videcon type. Both are mobile and one has a zoom lens. Each receiving room is equipped with a 25-inch receiver.

A sound intercom system has been installed in each of the receiving rooms as well as in the originating room. It operates independently from the coaxial cables which transmit the video lesson. This intercom system allows a student to ask a question from where he is seated in the receiving room. It is, however, necessary for the student to indicate to the proctor that he wishes to ask a question so the proctor can push a button allowing the voice to carry to the originating room. The question and answer would then be heard in all receiving rooms. The intercom system, unfortunately, does not always work well and is used very little by the students. At the end of each class period, five minutes is allowed for student questioning.

Need for the Study

Although many studies have compared the relative effectiveness of ITV and the classroom-discussion method of teaching in relation to student achievement, fewer studies have analyzed student attitudes toward the two methods. Attitudes vary in each learning situation and are affected by such diverse factors as course content, type of institution

of learning, socio-economic level of students, and the instructor. Introductory college geography, being an atypical lecture course, is especially in need of such research, as no studies have been made of student attitudes taught by either method.

Introductory college geography is a systematic course which is topically arranged. A definition commonly accepted for human geography is, "A study of man in relation to his environment." The course deals with the scope and techniques of geography, earth-sun relationships, the atmosphere, winds and weather, climatic regions, biologic regions, natural vegetation, landforms, oceans, soil and soil conservation, agriculture, mineral resources, manufacturing, trade, transportation and communications, and other topics.[12] Simple skills are taught such as working with different types of maps and globes as well as understanding of contour lines, relief-type maps, scales, and other geographical materials. A student's attitudes toward the method of instruction may be reflected in his ability or inability to understand or master such materials and concepts.

Many geography majors at East Central State College decide on the discipline as an area of study through interest generated in the introductory geography course. This study will determine if positive attitudes or interest in geography

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[12] Otis W. Freeman and H. F. Raup, Essentials of Geography (New York: McGraw-Hill Book Company, Inc., 1959).

is facilitated, hindered, or remains unchanged as a result of having been taught by either of the two methods. With more insight into student attitudes, the chairman of the Geography Department and the administration will be in a better position to decide the future of ITV geography courses at East Central State College. No serious study of any type has been done in relation to televised teaching of any course at East Central State College.

Stickell makes the following recommendation in his study, "It would seem useful to evaluate the interpretability of comparisons, and draw some conclusion or conclusions about attitudes toward the two modes of instruction."[13] This study should provide interpretable and useful comparisons of attitudes toward the two methods of instruction.

Statement of Problem

The problem of the study was to identify, measure, and compare attitudes of students taught introductory college geography by ITV and the classroom-discussion method. In order to solve this problem four null hypotheses were formulated which stated in essence that there was no significant difference in attitudes between the two groups after being taught by ITV and the classroom-discussion method.

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[13]Stickell, op. cit., p. 67.

Assumptions

One basic assumption was necessary for this study. It was assumed that the two groups who received introductory college geography instruction by the two methods (ITV and classroom-discussion) were exposed to the same course content during the semester studied. This assumption is valid since the following aspects of the teaching situation were controlled: (1) the same instructor taught both classes, (2) the periods of instruction were as close as possible (ITV at 10:00 a.m. on Monday, Wednesday, and Friday and classroom-discussion at 11:00 on the same days), (3) the same text[14] was used, and (4) the same unit tests over the same course content were administered to both groups.

Limitations of the Study

This study is concerned only with those students who were enrolled in introductory college geography taught by the two instructional methods by Dr. Robert V. Garner at East Central State College, Ada, Oklahoma. The time involved was the spring semester of the academic year 1967-1968. The initial enrollment was 89 in the ITV class and 48 in the classroom-discussion class, but due to incomplete data on some students the sample was reduced to 81 in the ITV class and 44 in the classroom-discussion class. Only the attitudes of these 125 students were examined.

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[14] Freeman and Raup, loc. cit.

Due to schedule conflicts, enrollment procedures, and other factors inherent in a state college educational program, students were not assigned to either classroom situation. Conclusions drawn from the study will be applicable to that population and based upon the evaluation instruments used in the investigations. Generalizations to other situations are not appropriate.

Definition of Terms

The first six of the following technical terms in the field of educational research were defined by the Commission on Definition and Terminology of the National Education Association[15] as follows:

Closed-Circuit Television (CCTV) -- A television system which limits distribution of any image to those receivers which are directly connected to the origination point by coaxial cable or microwave link.

Instructional Television (ITV) -- Any closed-circuit or broadcast television program which provides formal instruction, usually for credit.

Educational Television (ETV) -- (1) Any broadcast or closed-circuit television program which provides informational enrichment or peripheral enlightenment. (2) A generic term

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[15]Commission of Definition and Terminology, "The Changing Role of the Audio Visual Process in Education: A Definition and a Glossary of Related Terms," Audio-Visual Communication Review, II (January-February, 1963), p. 85.

often applied to any television program related to some form of instruction.

Instructional Situation -- The learning environment in which the student and teacher interact.

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.

Intercommunication System -- Usually a two-way (intercom) audio network which permits talk-back between the teacher and student in any remote classroom on a closed TV circuit.

Introductory College Geography -- Elements of Human Geography--a study leading to the understanding of the world as the home of man; relationships of such factors as the earth as a globe; climate, landforms, water bodies, minerals, and cultural patterns of the world.

Classroom-discussion Instruction -- Formal classroom instruction by an instructor or instructors located in the same room as the students.

Organization of the Report

The report of this study is organized into five chapters. The introductory chapter presents the general plan and background of the study. Chapter II is devoted to the review of literature related to the study. Chapter III presents the procedures involved in collecting and analyzing the data,

and Chapter IV is devoted to the presentation and analysis of the data. Chapter V consists of the summary, conclusions, and recommendations.

CHAPTER II

REVIEW OF RELATED LITERATURE

Probably no other teaching method has been investigated more than instructional television at all levels of education. Conferences and committees have been formed and meet regularly to discuss the merits, shortcomings, and possibilities of this relatively new method of instruction. Many researchers have studied and continue to study and evaluate television teaching.

In higher education Pennsylvania State University[16] conducted some of the first studies and did extensive research into the effectiveness, acceptability, appropriateness, and feasibility of teaching by television. Other well-known studies have been carried out by researchers at the Oregon State System of Higher Education,[17] Chicago City Junior

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[16] Leslie P. Greenhill, Closed-Circuit Television for Teaching in Colleges and Universities (University Park, Pa.: Pennsylvania State University, 1966).

[17] G. Starlin and J. E. Lallas, Inter-Institutional Teaching by Television (Oregon State System for Higher Education, March, 1960).

College,[18] Purdue University,[19] Miami University,[20] Case Institute,[21] Rensselaer Polytechnic Institute,[22] New York University,[23] San Francisco State College,[24] and Michigan State University.[25]

Although this is a study of student attitudes toward television instruction, it seems necessary to provide a background by discussing television teaching in general. Literature was reviewed in the following areas: Comparative effectiveness Studies, Attitude Studies, and Geography by ITV. In addition a more detailed review was made of the

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

[19] W. F. Seibert, An Evaluation of Televised Instruction in College Freshmen Mathematics, (Purdue University, July, 1958).

[20] F. G. Macomber, L. Siegel, et al., Experimental Study in Instructional Procedures: Final Report (Oxford, Ohio: Miami University, January, 1960).

[21] J. R. Martin, Two-way Closed Circuit Educational Television, Research Report 948-2 (Cleveland, Ohio: Case Institute of Technology, February, 1957).

[22] J. F. Throop, L. T. Assini, and G. W. Boguslavasky, The Effectiveness of Laboratory Instruction in Strength of Materials by Closed-Circuit Television (Troy, New York: Rensselaer Polytechnic Institute, November, 1958).

[23] H. L. Klapper, Closed Circuit Television as a Medium of Instruction 1956-1957 (New York University, 1958).

[24] A. R. Lepore and J. D. Wilson, An Experimental Study of College Instruction Using Broadcast Television, Project Number Two, (San Francisco State College, Fall, 1958).

[25] Hideya Kumata, Attitude Change and Learning as a Function of Mode of Presentation and Prestige of Instructor (East Lansing: Michigan State University, 1958).

comprehensive instructional television research conducted at Pennsylvania State University.

Closed-Circuit Television for Teaching in Colleges and Universities[26]

The research conducted by Leslie P. Greenhill, director of the University Division of Instructional Services at Pennsylvania State University, is considered to be of particular significance to any study concerned with television teaching.

The question that arises at the outset of Greenhill's study is, "What purposes do colleges and universities seek to achieve through the use of closed-circuit television in their instructional programs?" He answers that one way in which colleges and universities are attempting to meet the problem of mounting enrollments is by presenting regular instruction to students in many classrooms by CCTV. An instructor or a team of instructors can teach greater numbers than by the classroom-lecture method. The standard of instruction can be raised by extending the influence of the best professors to larger numbers of students and by making it possible to present demonstrations and other teaching materials that could not or would not be used in a regular classroom situation.

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[26]Greenhill, loc. cit.

A second major use of CCTV, according to Greenhill, is the presentation, extension, and magnification of demonstrations so they can be observed by all students in a large auditorium or laboratory situation. This has been very successful in improving the efficiency of laboratory work at Pennsylvania State. Students can see laboratory demonstrations close-up, be given uniform instruction, and can be paced step-by-step through difficult laboratory operations. Used in this manner television can help avoid duplication of expensive laboratory equipment, and special and expensive set-ups can be shown and demonstrated to the students.

Other uses of CCTV listed are as follows:

(1) Remote observation of teaching or other activities.

(2) Distribution of films to classrooms without the necessity of providing film projectors in each room or of darkening the rooms for viewing films.

(3) Training of students in television techniques or in teaching via television.

(4) Presentation of instruction or special lectures to overflow audiences.

(5) Televising instruction or special programs into dormitories.

(6) Research on instruction.

(7) Recording on video tape of presentations for re-use or exchange with other institutions.

(8) The presentation of new types of tests incorporating life-like problem situations for students to solve.

Greenhill states that special effort was made to determine the attitudes of faculty and students toward the use of ITV as a means of handling courses with large enrollments. He feels that students are quicker to accept innovations in teaching than most faculty members, and that lack of student acceptance does not appear to be a serious threat to television teaching provided that the instruction is good, the reasons for using television are valid, and the opportunities it provides are clearly explained.

The following is a summary of the findings at Pennsylvania State University:

Comparative Effectiveness

1. In 29 out of 32 controlled comparisons in seven different courses, there were no significant differences in achievement between students taught via CCTV and those taught in the conventional manner. (The same teachers were used in each pair of comparisons.)

2. In three different courses, there were no significant differences between scores on course-related attitude tests taken by students taught via CCTV and those taught by the same teachers in the conventional way.

3. No significant differences in students' achievements were found when proctors of varying status were used to supervise classroom groups of students in televised classes. Proctors included peers, seniors, graduate students, and faculty members.

4. No significant differences in student achievement were found in comparisons of classes of various sizes taught via television. Size of classes ranged from 11 to 119 students.

5. Several methods of providing for teacher-student interactions were studied in different courses. These included the use of questions and answers over an intercommunication system between the TV classrooms and originating room, and the rotation of students through the TV originating room. Neither of these methods produced measurable increments in learning, but the students strongly favored the use of the intercommunication system.

Acceptability

1. Student responses show that on the average 78 per cent of students think that the use of television is either a "very good" or "fairly good" means of teaching courses with large enrollments.

2. Students in TV classes ranked televised instruction first over conventional instruction in classes of 200 taught by the same instructor, or classes of 45 taught by graduate assistants.

3. In five courses, students were given instruction via television, and in face-to-face situations by the same teachers. They were then given a choice between the two methods of instruction for the remainder of the semester. On the average, students chose televised instruction six to

four over face-to-face instruction by the same teacher in a large class.

4. Attitudes toward televised instruction by faculty members have varied greatly. A few are quite negative toward it, some are enthusiastic, and the largest proportion appears to be undecided or indifferent. Many faculty members have not observed televised classes.

5. Almost every semester, there has been an increase in the number of courses and instructors participating in the television project. (In 1964, 7,506 students were enrolled in 18 courses taught by television.)

Comparative Effectiveness Studies

It is an accepted fact now that television instruction is an effective means of teaching. Most of the studies reviewed on student achievement indicated that ITV students perform as well as those taught by the classroom-discussion method.

Stickell examined 250 comparative studies on the college level to determine if there were significant differences at the 0.05 level of confidence. He states, "When considering only those studies which were judged interpretable, there are no contradictory results. Although the data are quite limited, it seems safe to say that neither the televised nor face-to-face mode of instruction has demonstrated a superiority as measured by achievement tests."[27]

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[27]Stickell, loc. cit., p. 66.

Schramm, writing in 1962, reported on 393 cases in which instructional television was compared with other classroom teaching methods, 32 cases in which home instruction by television was compared with classroom teaching, and 14 cases in which military instruction by television was compared with face-to-face instruction. The majority of cases examined indicated no significant differences in the two methods. His findings indicated that ITV was most likely to be more effective than face-to-face instruction in the lower grades than at the college level. He also reported that ITV was more likely to be superior to face-to-face instruction in science and mathematics than in the humanities.[28]

Kumata discussing the methods of instruction in 1958 stated, "There have been at least sixty studies aimed at answering the general question whether the mode of communication makes a difference, and, with very few exceptions the answers are that there are no significant differences."[29]

Additional support of the preceding statement is provided in the following quotations by authorities in television teaching. Partridge states, "There are many indications that whole subject-matter areas, taught over television

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[28]Wilbur Schramm, "What We Know about Learning from Instructional Television," Educational Television: The Next Ten Years (Stanford, California: The Institute for Communication Research, 1962), p. 53.

[29]Hideya Kumata, College Teaching by Television, Edited by Adams, Carpenter, and Smith (Washington, D. C.: American Council on Education, 1958), p. 84.

by an expert teacher can be effectively and economically transferred to the minds of young people."[30] Martin says, "The results of practically all studies of closed-circuit television as a medium of instruction have indicated that its use is entirely practical and that, in most cases, the learning process is as effective as that obtained by conventional teaching methods."[31] A Ford Foundation study brings out that, ". . . in many college courses students can be expected to do equally well in examinations whether they have been taught by a teacher in a regular classroom or by the same teacher over television."[32] This publication cites examples at several institutions of higher learning where different subjects were taught successfully by ITV. In writing about the military services' attempts to teach by television Siepmann is quoted, "Television instruction proved at least as effective as conventional instruction."[33]

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[30]E. DeAlton Partridge, "Introduction," Television in Teacher Education (Washington, D. C.: American Association of Colleges for Teacher Education, 1960), p. 3.

[31]John R. Martin, College Teaching by Television, Edited by Adams, Carpenter and Smith (Washington, D. C.: American Council on Education, 1958), p. 221.

[32]Teaching by Television, A Report from the Ford Foundation and the Fund for the Advancement of Education (May, 1959), p. 22.

[33]Charles A. Siepmann, TV and Our School Crisis (New York: Dodd, Mead and Company, 1958), p. 115.

Attitude Studies

Many more studies have been conducted on comparative effectiveness of ITV than with student attitudes. Some of those studies, however, did include sections dealing with attitudes, but the main emphasis was placed on relative effectiveness as indicated by achievement scores. The following reviews represent some of the most significant and typical studies that have been done on student attitudes toward ITV. Some represent favorable reactions and others show neutral or unfavorable student reactions and attitudes.

Kumata utilized the semantic differential instrument in his study of student attitudes at Michigan State University. A division of the study involved 840 students enrolled in a basic social science course. An analysis of variance run on American Council on Education Psychological Examination for College Freshmen (ACE) scores showed no significant differences between the experimental (ITV) and control groups. Seven concepts were used to measure attitudes. Two related specifically to the teaching method (Teaching over Television and Face-to-Face Teaching), and the other five related to the subject matter. The adjective pairs used to rate the concepts were divided into three dimensions (evaluative, activity, and potency) and were analyzed accordingly. The "t" scores on the scales of the attitude instrument among groups indicated that ITV students thought teaching by television was clearer than the control groups. The immediate post-test results showed

that students with prior ITV experience tended to be more favorable to that method of instruction. There were no consistent significant differences for the five concepts dealing with subject matter.[34]

Evans examined students' attitudes toward ITV as a medium of instruction in a psychology course taught partly by television and partly through on-campus discussion groups. Seventy per cent of the students showed an interest in taking another course involving television instruction, 13 per cent would not do so, and 16 per cent were undecided. Among the "open-end" question responses, feelings were revealed that television lectures were better developed than regular classroom lectures and involved fewer disturbing interruptions. It was felt, however, that they lacked opportunity for class participation and were subject to technical electronic interruptions.[35]

A study showing favorable attitudes by students toward television teaching was carried out by the University of Miami in 1961. In this study 66 high school graduates took history and logic by ITV during the summer before entering college in the fall, while 362 took the courses by the regular lecture method. Interviews with television-taught students after the

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[34]Kumata, loc. cit.

[35]Richard K. Evans, "An Examination of Students' Attitudes Toward Television as a Medium of Instruction in a Psychology Course," Journal of Applied Psychology, XL (1956), pp. 32-34.

second semester of the next academic year indicated that they felt they could see and hear better by television. They reported being less inhibited or distracted than in a large face-to-face class. The television students did not believe that lack of "personal contact" was detrimental to learning. Student-teacher contact seemed to be regarded as desirable but not essential to the educational objectives of the course.[36]

Beatts concluded in a 1957 study that teachers and students became increasingly more favorable to instructional television over a period of time.[37] A study by Carpenter and Greenhill also showed more student acceptance with exposure. Over a three-year period students thought that ITV courses had better organized presentations and instructors.[38]

An interesting insight into teacher attitudes is presented in a study by Handleman. His sample was 136 teachers from 24 colleges and universities representing major geographical sections. The questionnaire used was a 40-item instrument concerning the use of closed-circuit instructional

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[36]Sydney W. Head and C. Lee Philips, A Field Experiment in the Summertime Use of Open-Circuit Television Instruction to Bridge the Gap Between High School and College (Coral Gables, Florida: University of Miami, 1961).

[37]Patrick M. Beatts, "Report on Instructional Closed Circuit Television for 1957," Audio-Visual Communication Review, VII (1959), p. 306.

[38]C.R. Carpenter and L. P. Greenhill, Instructional Television Research, Report No. 2 (University Park, Pa.: Pennsylvania State University, Spring, 1958).

television. Teachers who had taught by television had a significantly higher attitude toward ITV than teachers who had not taught by this method. A significant positive correlation was shown between length of time of ITV teaching and strength of positive attitudes.[39]

A study by Evans, Wieland, and Moore concerned the effect of previous television experience on attitudes toward television as an instructional medium. The study involved 160 students, 45 of whom had been previously enrolled and graded in an ITV class. The remaining 115 had no prior experience in television-taught courses. A modified Osgood-type semantic differential test was administered to all subjects. The "t" test for the difference between the means of the two groups was not significant. The authors contend that if all related variables (e.g., attitude toward the instructor, the subject matter itself, general motivation arousal characteristics of the course) could be held constant, television as a teaching medium would take its place along side other educational media; that is, they are all equally well received in proportion to the extent that effective learning principles are implemented in their use.[40]

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[39]Evans, Wieland, and Moore, "The Effect of Experience in Telecourse on Attitudes Toward Instruction by Television and Impact of a Controversial Television Program," Journal of Applied Psychology, XLV (1961), pp. 11-15.

[40]Stanley D. Handleman, "A Comparative Study of Teacher Attitudes Toward Teaching by Closed-Circuit Television," Dissertation Abstracts, XXI (1960), p. 1289.

In a Los Angeles City School District's study student reactions to ITV were varied. The two main objections to ITV were the students' inability to ask questions and the lack of personal association with the instructor. Opinions varied with the situation. Most students preferred face-to-face classes, but at the same time preferred an ITV class, if not too large, to a large face-to-face class.[41]

Janes's study in 1961 with 375 college students revealed no significant differences in attitudes toward sociology for either of the two methods of instruction. Students could choose which method of instruction they preferred and could change method any time during the semester. Questionnaires were administered in the fourth and fourteenth weeks of the semester to measure student attitudes.[42]

A study conducted by Herminghaus involved about 1,000 ninth-grade English and science students with one group taught by ITV and the other by the lecture-discussion method. Students, on the whole, did not react favorably to television teaching. Two-thirds of the English students and half of the science students taught by television thought they would have learned more in the face-to-face situation. They also felt

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[41]Los Angeles City School Districts, An Evaluation of Closed-Circuit Instructional Television in Los Angeles City College and Los Angeles Valley College, Final Report (Los Angeles: Los Angeles City School Districts, 1959).

[42]Robert W. Janes, "An Educational Experiment with On-campus Open-Circuit Television," Journal of Educational Sociology, XXXIV (1961), pp. 300-308.

that ITV was less interesting and that they missed personal contact with the teacher. Herminghaus concluded that students, by the ninth grade, expect face-to-face contact with a teacher in the instructional situation and feel insecure when taught by television.[43]

Seibert's study of student attitudes toward CCTV also showed unfavorable reactions. Forty-six students were enrolled in an ITV class in Mechanical Engineering, and other students were enrolled in the same course in a face-to-face class. Unfavorable responses included inability to ask questions (although a talk-back system was available), lack of opportunity to take notes in class, and lack of opportunity to know the teacher. Some favorable responses included the value of television demonstrations and a feeling of greater comfort in television classes.[44]

In a 1963 study by Becker a semantic differential instrument was taken by 594 entering freshmen at the University of Iowa. There were 18 concepts and 14 seven-point bipolar adjectives in the instrument. One concept was "Use of TV in College Courses." None of the students were enrolled in a college ITV course, but the scores on the concept relating

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[43]Earl G. Herminghaus, "Large Group Instruction by Television: An Experiment," School Review, VI (1957), pp. 119-133.

[44]W. F. Seibert, "A Brief Report and Evaluation of Closed-Circuit Television in Mechanical Engineering 360," Audio-Visual Communication Review, VI (1958), p.77.

to television teaching were consistently less favorable than scores on other concepts such as "Education," "Professor," or "Library."[45]

Torkelson conducted a study to determine teacher and student attitudes toward ITV. The sample was 130 students taking a course in Teacher Audio-Visual Education. In this study there were four presentation methods: (1) in-studio presentation with monitors for magnification, (2) large lecture room with television viewing only, (3) small room with television viewing only, and (4) a large lecture room with the instructor present and monitors used only to show a kinescope. The same 130 students were involved in all four methods of presentation and filled out an attitude questionnaire after each class period. Sixty-three per cent of the students had taken a course by ITV before, and 62 per cent indicated they would not take another course by this method. Sixty-eight per cent of the sample felt that the television portions of the course were of some value. Sixty-two per cent preferred the small television viewing rooms to the large lecture viewing room, but the same percentage preferred instructor and appropriate projectors in one large room over use of television. Eighty-seven per cent thought that upper-level courses should not be taught by television. Eighty-one per cent felt that more "gimmicks" were needed to maintain

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[45]Samuel L. Becker, "The Meaning of ITV: A Study of Student Expectations," NAEB Journal, XXII (1963), pp. 25-31.

attention in an ITV class than in classroom-lecture sessions. Sixty-three per cent believed that color television would improve their receptiveness.[46]

Bailey's study in 1959 showed that attitudes of students taking general physics by ITV were not favorable toward the method at the end of the course. They felt that achievement, retention, and final grades were lower in the television section. They disagreed that ITV had fewer distractions and helped them concentrate better. The study indicated that the unfavorable reaction might be the result of technical difficulties such as poor sound and pictures.[47]

The conclusion reached in a study concerned with teaching calculus by CCTV was that ITV students shifted toward an unfavorable opinion of television as the means of instruction after the experiment. This result was reached after the experimental group (ITV) and control group (non-ITV) took a 10-item pretest and post-test attitude inventory instrument. After the course was over, however, about 40 per cent of the students in both groups felt that television had a place in the instruction.[48]

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[46] G. M. Torkelson, "Teacher AV Education via Closed-Circuit Television," Audio-Visual Communication Review, VI (1958), pp. 188-199.

[47] H. S. Bailey, "Teaching Physics on Closed-Circuit Television," Dissertation Abstracts, XIX (1959), p. 1947.

[48] Dyer-Bennet, Fuller, Seibert, and Shanks, "Teaching Calculus by Closed-Circuit Television," American Mathematical Monthly, LXIII (July, 1958), pp. 430-439.

Undoubtedly there is some relationship between how well students do in a course and their attitude toward the method of instruction. King in a 1959 study of a math course taught by ITV showed that television students making "D" and "F" grades preferred television less than television students making "A" and "B" grades.[49]

The preceding studies reveal that there is no concensus of student attitudes toward ITV since some are favorable, others are unfavorable, and some neutral. The research reviewed indicated that in most cases students preferred the classroom-discussion method and small classes over ITV and large classes. However, there is no substantial evidence that a student's attitude toward the instructional method affects his performance, for most comparative effectiveness studies found no significant difference in achievement of students taught by the two methods.

Teaching Geography by Television

Few studies have been conducted in relation to televised geography instruction. In a 1967 publication, Research Needs in Geographic Education, it is stated that a need exists in the discipline for such studies. Bacon and Kennamer assert, "New media. . . have been seized upon by

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[49]C. E. King, "A Comparative Study of the Effectiveness of Teaching a Course in Remedial Mathematics to College Students by Television and by the Conventional Method," Dissertation Abstracts, XX (1959), p. 2177.

geographers as effective tools in geographic education. Yet the research-oriented geographer and educator has paid scant attention to assessing the effectiveness of one tool over another or to increasing the efficiency of these tools."[50]

A comparative study of an introductory geography course was made by Johnson in 1959 at Macalaster College, Saint Paul, Minnesota. In the experimental group 66 students (44 day-students, 22 off-campus students) were taught by open-circuit television which was broadcast over KTCA from September 16, 1958, to January 15, 1959. A control group consisted of two day-classes taught by the same instructor, an experienced and highly competent teacher. The study compared teaching effectiveness and learning retention which were measured with a 50-item multiple choice test given over factual material from the content of the course. The test was given to both groups of students as a pretest, as a final exam, and as a retention test after a three-month interval. Conclusions from analysis of the test results are as follows:

1. Students in both sections of the day class achieved a higher mean score than the students in the television class.

2. Students in both groups did significantly better at the end of the course than at the beginning.

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[50]Phillip Bacon and Lorrin Kennamer, "Suggestions for Research in Geographic Education," Research Needs in Geographic Education, (Normal, Ill.: National Council for Geographic Education, 1967), p. 45.

3. Achievement according to ability levels followed the usual pattern with students of higher ability learning more than those with lower ability whether taught by television or in the classroom.

4. Students in the television class and in section B of the day class answered almost the same number of questions after a three month interval as they had answered in the final test.[51]

During the 1957-1958 academic year, the Los Angeles School District carried out a comparative study of several disciplines including geography. Introductory geography was taught by the two teaching methods during both semesters, and it was shown that the scores of the control group were not significantly higher than the experimental group taught by ITV.[52]

In A Handbook for Geography Teachers published in 1966 by the National Council for Geographic Education, three types of programs that may be classified as educational television are listed. They are briefly summarized below:

1. Educational programs on regular public television -- A possible resource for classroom teaching in that they may be used to supplement and enrich classroom instruction through after-school viewing.

2. Complete geography courses on educational television stations -- Such courses have

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[51]Johnson, loc. cit.

[52]Los Angeles City School Districts, loc. cit., p. 237.

already been used by school systems in the areas of physics and biology where the district was too small to hire a qualified teacher. It could represent the entire learning experience in geography.

3. Television instruction that is the core of a learning situation with follow-up activities undertaken with the direction of a classroom teacher -- By far the most important type of televised program for in-school instruction. Certain geographic facts and concepts can be presented and developed effectively by means of televised programs because of available cinematic techniques.[53]

Each of these programs is discussed more thoroughly by Kohn. In relation to educational programs on regular public television he cautions that the teacher needs to find out as much as possible about the program, and then decide if it meets the objectives of the course. It is stated that if educational television is to fulfill its potentialities some way must be found to make kinescope recordings or films available to schools for showing and reshowing as the teacher needs them. In this way they will become better integrated with the regular school program.[54]

As to the second type of ITV it is brought out that as early as 1961 the Association of American Geographers and

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[53]William W. Elam, Herbert H. Gross, and Blanche Quigley, "Equipment, Materials, and Sources," A Handbook for Geography Teachers, Edited by Robert Gabler (Normal, Illinois: National Council for Geographic Education, 1966), p. 37.

[54]Clyde F. Kohn, "Media and Techniques for Geography Education," Curriculum Guide for Geographic Education, Edited by Wilhelmina Hill (Normal, Illinois: National Council for Geographic Education, 1964), pp. 107-134.

the National Council for Geographic Education were working on a high school geography course to be filmed and used directly in the classroom or for telecasting to several classrooms at once. A school system which had no qualified geography teacher could purchase such a course and let it represent the entire learning activity in geography.

In discussing the third and most relevant of the three types of programs in this study Kohn's comments are pertinent.

> This type of instruction neither replaces nor displaces the teacher, but is the core of the learning situation. Those who subscribe to this type believe that television is nothing more than a mechanical device which can, at best, accomplish only those parts of the teaching process which lend themselves to decisions made in advance and apart from the immediate audience. Certain geographic facts and concepts can be presented and developed effectively by means of televised programs because of available cinematic techniques which are not available to the classroom teacher. But, as already stated, teaching involves far more than presenting information, telling, or making demonstrations. If they are to be effective, televised lessons must be integrated into a total teaching program, along with other audio-visual aids.[55]

The review of literature revealed that many schools and colleges produce their own programs for use in the classroom. Kohn suggests that more time is needed for planning the presentation since many seem no better and some are worse than regular classroom teaching. He states specifically that the broad objectives of the course need to be stated, the visuals to be used must be obtained, key points or questions

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[55] Ibid., p. 127.

need to be listed, and what is to be said needs to be carefully thought through. He recommends that the camera pay less attention to the instructor and more to the visuals that are to be shown. More effective use could be made of maps, globes, and still and motion pictures by showing them as close-ups without the teacher being shown at all. It is stressed that students must be given enough time to see the visual aids well and to fully comprehend them. Kohn concludes that educational television possesses great potential as an instructional aid, provided it is used effectively by school systems.[56]

Summary

The review of literature relating to televised instruction revealed that much has been written about this mode of instruction. Literature was reviewed in the following areas: Comparative Effectiveness Studies, Attitude Studies, and Teaching Geography by ITV. Most comparative effectiveness studies relating to student achievement indicate that students taught by television perform as well on achievement tests as those taught by the classroom-discussion method. In studies of student attitudes toward ITV the findings were varied with some attitudes favorable, some unfavorable, and others neutral. This medium was generally accepted as a means for teaching courses with large enrollments. A few studies have been

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[56] Ibid., p. 125.

conducted in relation to televised geography instruction, but none were found relating to student attitudes. Noted writers in geography point to a need for such research.

CHAPTER III

DESIGN OF THE STUDY

The purpose of this study was to identify, measure, and compare attitudes of students who were taught introductory college geography by closed-circuit television and those taught by the classroom-discussion method.

Population

The subjects were 125 students enrolled in two sections of introductory college geography at East Central State College, Ada, Oklahoma. For the study of attitudinal differences the section taught by CCTV was designated Group I and the other taught by the classroom-discussion method as Group II. The two groups were taught by the same instructor during the spring term of the 1967-1968 academic year. Group I had 81 students enrolled and was taught at 10:00 a.m. on Mondays, Wednesdays, and Fridays. Group II had 44 students and met on the same days at 11:00 a.m. The ITV students were alternately assigned to four different rooms for instruction. Each room (including the audio-visual room with live instruction) had 20 to 22 students. An advanced geography student

served as a proctor in each of the three receiving rooms as well as in the originating room. The students were rotated every three weeks to different receiving rooms and to the studio, but the proctors remained in the same rooms all semester. This gave all of the students equal time in the broadcasting room with live-instruction and also equal time with each of the four proctors.

Tests for Homogeneity. During the first week of classes tests were run on the following variables to determine if the two groups were from the same population:

(1) Mental ability[57]

(2) Geography achievement[58]

(3) Age

(4) Sex

(5) Attitude on pretest

Raw data for the first four variables are in Appendix A (Group I) and Appendix B (Group II).

The Mann-Whitney U test[59] was applied to the mental ability and geography achievement scores between the two groups. The results of the tests respectively yielded "z"

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[57] Otis Gamma Mental Ability Test (New York: Harcourt, Brace and World, Inc.).

[58] Geography Achievement Test for Beginning High School Pupils (Normal, Illinois: National Council for Geographic Education, 1965).

[59] Statistical formulas for the Mann-Whitney U test, chi-square test, and "t" test are in Appendix C.

scores of 0.5328 and 1.1145 which were not greater nor less than the critical "z" scores of $\pm$ 1.96, and therefore indicated no significant difference on the two variables at the 0.05 level of confidence.

The chi-square test applied to the sex variable indicated no significant difference between the two groups. The chi-square score of 0.020 was much less than the 0.384 (with 123 df) necessary to show difference at the 0.05 level of confidence.

There was no significant difference between the two groups on the age variable. The mean age of Group I was 20.96 and the range was 26 years. Group II had a mean age of 20.11 and a range of 27 years.

The semantic differential attitude results on the pretests for Group I and Group II were analyzed. The "t" test was applied to each of the three dimensions for each concept. All "t" values were less than the critical ratio of 1.979 at 123 df necessary to show a significant difference at the 0.05 level of confidence. The "t" values are shown in Appendix D.

Since there were no significant differences in these variables the two groups were considered adequately matched for the purpose of attitudinal investigation.

Development of the Semantic Differential Attitude Instrument

A review of related literature revealed that many instruments have been used in previous studies of student attitudes toward televised instruction. Becker;[60] Evans, Wieland, and Moore;[61] Kumata;[62] and others have used the semantic differential technique to investigate student attitudes.

A special form of Osgood's semantic differential instrument was developed for this study.[63] The semantic differential measures the connotative meanings of concepts as points in what Osgood has called "semantic space." Space is measured with points on bipolar rating scales. For example, on a scale of 1 to 7, the point checked would indicate space or how the subject perceived the concept being studied.[64] The semantic differential is a widely used instrument in attitudinal studies since it produces much meaningful and interpretable data. Reliability of the instrument is in the high .80's.

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[60] Becker, loc.cit.

[61] Evans, Wieland, and Moore, loc. cit.

[62] Kumata, Attitude Change and Learning.

[63] Charles E. Osgood, George J. Suci, and Percy Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957).

[64] Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1965), p. 564.

The first and most important task in constructing a semantic differential instrument is to select the concepts to be rated with the adjective pairs. The concepts chosen should be relevant to the research problem but should also cover semantic space. If all the concepts were similar in meaning the semantic space dimensions could not be adequately defined. Concepts should have the potential for different reactions by those who have different attitudes or they are inadequate for measuring purposes. The fifteen concepts and nine adjective pairs rated for each concept in this study were carefully chosen after consultation with the geography department chairman (also the instructor of both groups investigated) and with an educational psychologist. The concepts were chosen to represent various aspects of a student's experience that might be subject to influence by either of the two teaching methods. The goals and objectives of the course were considered in selecting the concepts as well as certain attitudes and aspects of teaching and education which would cover semantic space and which were felt needed to be measured.

The concepts thus identified are as follows: (1) Geography, (2) Me (self), (3) Small Classes, (4) Teaching, (5) Questions, (6) TV Classes, (7) Large Classes, (8) Education, (9), Interest in Geography, (10) Maps and Charts, (11) Individual Attention, (12) Meaning, (13) Future, (14) Professors, (15) Usefulness of Geography.

Four concepts were selected to represent aspects of the particular course, its context, materials, and requirements. These are Geography, Interest in Geography, Maps and Charts, and Usefulness of Geography.

Five concepts relate to the medium of instruction and to the student being in either of the two instructional situations: Small Classes, Questions, Large Classes, Individual Attention, and TV Classes.

The remaining six concepts are broad in meaning and were selected primarily to determine the student's general attitude toward life, themselves, and their educational life. These are Me (self), Education, Future, Professors, Meaning, and Teaching.

The second step in constructing a semantic differential instrument is to select appropriate scales or adjective pairs. The attitude concept is judged on a series of adjectival bi-polar scales. The student checks direction and intensity of association of the concept being judged on each of the adjectival scales. The following is an example:

Fair (7):(6):(5):(4):(3):(2):(1) Unfair

The middle space (4) is the neutral point. The spaces immediately to each side of the neutral point are defined as slightly fair (5) or slightly unfair (3). The next spaces (6 and 2) are defined as quite fair (6) or quite unfair (2). The spaces to the extreme (7 and 1) show very fair (7) or very unfair (1).

The nine adjective pairs chosen for this study were taken from Osgood's list. Osgood has found that, when analyzed, adjective pairs fall into clusters. The most important clusters seem to consist of adjectives that are evaluative. A second cluster has adjectives that seem to share strength or potency ideas. A third important factor is called activity because its adjectives seem to express motion and action.

Osgood uses three scales to represent each dimension and each scale is highly "loaded" on one dimension and not on the others. The sums or averages of the three scales on each dimension are ordinarily used as scores. This method served as the model for the present study.

The first three adjective pairs used in the instrument devised for this study are evaluative: Fair-Unfair, Valuable-Worthless, Pleasant-Unpleasant. The second three relate to activity: Active-Passive, Fast-Slow, Relaxed-Tense. The last three measure potency or strength: Strong-Weak, Hard-Soft, Deep-Shallow. Three of the nine adjective pairs (numbers 3, 6, 7) were reversed to counteract response bias tendencies.

Each of the 15 concepts was treated on a separate sheet in a test booklet with the same adjective pairs and rating scales below (Appendix G). The following is an example of a concept and the nine adjective pairs used in the study:

GEOGRAPHY

1. Fair	:	:	:	:	:	:	Unfair	
2. Valuable	:	:	:	:	:	:	Worthless	
3. Unpleasant	:	:	:	:	:	:	Pleasant	
4. Active	:	:	:	:	:	:	Passive	
5. Fast	:	:	:	:	:	:	Slow	
6. Tense	:	:	:	:	:	:	Relaxed	
7. Weak	:	:	:	:	:	:	Strong	
8. Hard	:	:	:	:	:	:	Soft	
9. Deep	:	:	:	:	:	:	Shallow	

Figure 1.--Concept GEOGRAPHY and Adjective Pairs

The semantic differential instrument provides a great amount of data. Some questions that can be answered from analyzing the data are as follows: How do groups "see" or evaluate key concepts? What relative value do they place on the different concepts? What concepts are close together in their meaning space? What changes take place in attitude between groups, concepts, and adjective pairs during a specified time period?

The Hypotheses

The purpose of this study was to analyze attitudes of students who were taught introductory college geography by instructional television and the classroom-discussion method. Data were obtained from the semantic differential attitude instrument which was administered to both groups as a pretest

and a post-test. In accordance with the problem of this study the following null hypotheses were formulated:

H_{o1}: There is no significant difference in evaluative attitude means between the group of subjects who received introductory college geography by closed-circuit television and the group of subjects who received introductory college geography by the classroom-discussion method.

H_{o2}: There is no significant difference in activity attitude means between the group of subjects who received introductory college geography by closed-circuit television and the group of subjects who received introductory college geography by the classroom-discussion method.

H_{o3}: There is no significant difference in potency attitude means between the group of subjects who received introductory college geography by closed-circuit television and the group of subjects who received introductory college geography by the classroom-discussion method.

H_{04}: There is no significant difference in composite attitude means between the group of subjects who received introductory college geography by closed-circuit television and the group of subjects who received introductory college geography by the classroom-discussion method.

Statistical Treatment of the Data

The data from the semantic differential instrument administered to both groups yielded means for each of the attitude dimensions and also a mean for each concept. The statistical method used to determine if there was a significant difference between the means at the 0.05 level of confidence was the "t" test. Weinberg and Schumaker state that the one assumption that must be made before using the "t" test is that the variables in the population from which the sample is drawn are normally distributed, or at least there must not be a drastic departure from normality in their distribution. With a normal distribution, it is possible for an experimenter to use his sample mean to test a hypothesis about a population mean, even when he does not have actual knowledge of the standard deviation of the population from which he drew his sample.[65] The values yielded by the tests for homogeneity were not significant and it was assumed that the distributions could be treated as normal. Therefore, the "t" test was an appropriate statistic for testing the null hypotheses.

Administration of the Instrument

The semantic differential instrument was administered to the 81 students in Group I and to the 44 students in

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[65] George H. Weinberg and John A. Schumaker, Statistics An Intuitive Approach (Belmont, Calif.: Wadsworth Publishing Company, 1965), p. 193.

Group II during the first and last weeks of the spring semester of the 1967-1968 academic year.

The students were given thirty minutes at the end of a class period to consider each concept carefully and to decide how it should be rated on the adjectival scales. The subjects were instructed to rate each concept by placing a mark between the two adjectives at the point which best represented their feeling toward the concept.

Procedure for Analysis

The data obtained on Test I (pretest) and Test II (post-test) were analyzed by an IBM 1130 computer.

Test I. For Group I and Group II a mean and a standard deviation were found for (1) each of the three dimensions (evaluative, activity, potency) for each of the fifteen concepts, and (2) each of the fifteen concepts. The "t" test was then applied to the data. The "t" values as previously mentioned indicated that the pre-attitudes of the two groups did not differ significantly at the beginning of the semester.

Test II. During the last week of instruction of the semester the same semantic differential instrument was again administered to the students in both groups. For Group I and for Group II a mean and a standard deviation were again found for (1) each of the three dimensions for each of the fifteen concepts, and (2) each of the concepts.

Next it was determined if there was a significant change in attitudes on the dimensions or concepts between Test I and Test II for Group I and between Test I and Test II for Group II.

After determining the extent and direction of attitude change for Group I and Group II the post-attitude means were compared and analyzed to determine if there was a significant difference in the three dimensions on each concept between the two groups at the end of the semester.

The last analysis between the two groups was concerned with the composite mean for each of the fifteen concepts. Each of the concepts was examined and analyzed to determine how it was rated by the subjects in each group.

The means were plotted to show how the two groups "saw" or evaluated each dimension and each concept. The analysis of data is described in detail in the following chapter.

Summary

The study was designed to identify, measure, and compare attitudes of students who were taught introductory college geography by closed-circuit television and those taught by the classroom-discussion method.

The population consisted of 125 students enrolled in the spring semester of 1967-1968 at East Central State College, Ada, Oklahoma. There were 81 subjects taught by

CCTV and 44 taught by the classroom-discussion method. Appropriate tests applied to five variables gave no indication that the two groups were not from the same population.

The semantic differential attitude instrument developed for the study was administered to all subjects during the first and last week of classes. An appropriate statistical treatment of the data was used to test the four null hypotheses formulated for the study.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

The purpose of this chapter is to present, compare, and analyze data obtained from the semantic differential attitude instrument. The instrument was administered to each student in both teaching situations as a pretest and a post-test. Group I consisted of 81 students taught introductory college geography by closed-circuit television, and Group II contained 44 students taught by the classroom-discussion method.

Semantic Differential Analysis

The semantic differential instrument yielded the following information on the pretest and the post-test for each group:

(1) A mean for each of the three attitude dimensions (evaluative, activity, potency) for each of the 15 concepts (45 means).

(2) A composite or grand mean for each of the 15 concepts (15 means).

Each attitude dimension was composed of three adjective pairs. The Evaluative dimension included Fair-Unfair,

Valuable-Worthless, and Pleasant-Unpleasant. The Activity dimension consisted of the adjective pairs Active-Passive, Fast-Slow, and Relaxed-Tense. The third dimension, Potency, was composed of Strong-Weak, Hard-Soft, and Deep-Shallow.

It should also be remembered that the number "4" is a neutral number on the rating scales and that the other numbers represent the following attitudes within semantic space: 1-1.9 very unfavorable, 2-2.9 quite unfavorable, 3-3.9 slightly unfavorable, 4.1-4.9 slightly favorable, 5-5.9 quite favorable, and 6-6.9 very favorable.

The statistical treatment used to determine the significance of difference between the means of the two groups was the "t" test. The critical "t" ratios used in the analysis are at the 0.05 significance level and are for the proper degrees of freedom (df).[66]

Comparisons Within Each Group. Although not stated as hypotheses to be tested, the "t" test was applied to the means of the three dimensions within each group to determine if any significant change took place between Test I and Test II on each of the fifteen concepts.

Appendix E presents means and t-values for Group I (CCTV) on Test I and Test II on each of the three dimensions. The critical ratio at 160 df was found to be 1.977 at the 0.05

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[66] All "t" ratios are at the 0.05 level of confidence for the proper df and are taken from J. P. Guilford, Fundamental Statistics in Psychology and Education, Fourth edition (New York: McGraw-Hill, 1965), Table D, p. 580.

level of confidence. Appendix F portrays the same data for Group II. The critical ratio for the t-values of this group (86 df) was 1.988 at the same confidence level. The "t" values shown in Appendices E and F are all less than the critical ratios necessary for rejection, thereby indicating that no significant attitude change took place between Test I and Test II on any dimension for either group.

Comparison of Post-Means for Groups I and II. Tables I, II, and III and Figures 2, 3, and 4 analyze and portray the post-means of Group I and Group II on the evaluative, activity, and potency dimensions for each of the concepts. The direction of difference illustrates whether the CCTV group ranked the concept higher (+) or lower (-) than the non-TV group on each of the dimensions. The critical ratio at 123 df was found to be 1.978 at the 0.05 level of confidence. The "t" values presented in Tables I, II, and III show none exceeding the critical ratio. Hypotheses 1, 2, and 3 which state respectively that there is no significant difference in evaluative, activity, and potency meaning must therefore be accepted.

Although there was no significant difference on the evaluative meaning dimension Table I and Figure 2 indicate that the group taught by CCTV evaluated five of the concepts more favorably than the group taught by the traditional method. These were Me (self), TV Classes, Large Classes, Interest in Geography, and Meaning. The greatest difference

TABLE I

Evaluative Meaning
GROUPS I AND II -- Test II Means

Concept	Group I	Group II	Direction of Difference	t-Value
1. Geography	5.270	5.371	-	.0170
2. Me (self)	5.291	5.265	+	.0041
3. Small Classes	5.075	6.166	-	.1516
4. Teaching	4.983	5.257	-	.0364
5. Questions	4.475	5.030	-	.0813
6. TV Classes	5.004	4.356	+	.0785
7. Large Classes	4.395	3.545	+	.1048
8. Education	5.291	6.257	-	.1462
9. Interest in Geography	5.283	5.128	+	.0209
10. Maps and Charts	5.083	5.090	-	.0011
11. Individual attention	5.366	5.613	-	.0441
12. Meaning	5.279	5.090	+	.0283
13. Future	5.287	5.840	-	.0911
14. Professors	5.133	5.613	-	.0680
15. Usefulness of Geography	5.350	5.598	-	.0371

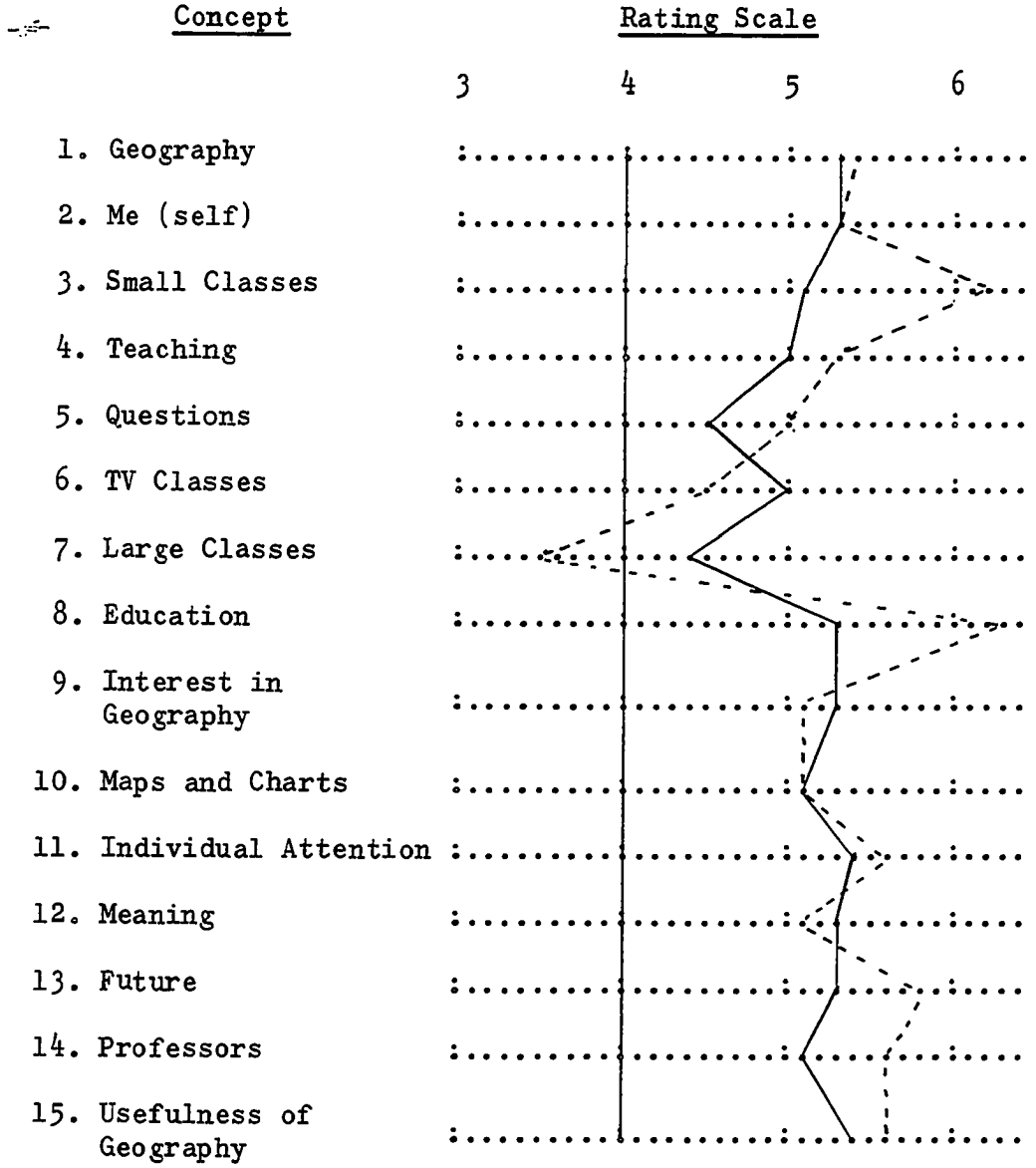


Figure 2.--Evaluative Meaning -- Test II Means

in the evaluative meaning space was on the concept Small Classes with the non-TV group ranking it more favorably. One concept, Large Classes, was ranked negatively (Slightly unfavorable) by the non-TV group. Two concepts, Small Classes and Education, were ranked "very favorable" by the non-TV group. The remaining concepts were ranked as either "slightly favorable" or "quite favorable" by both groups.

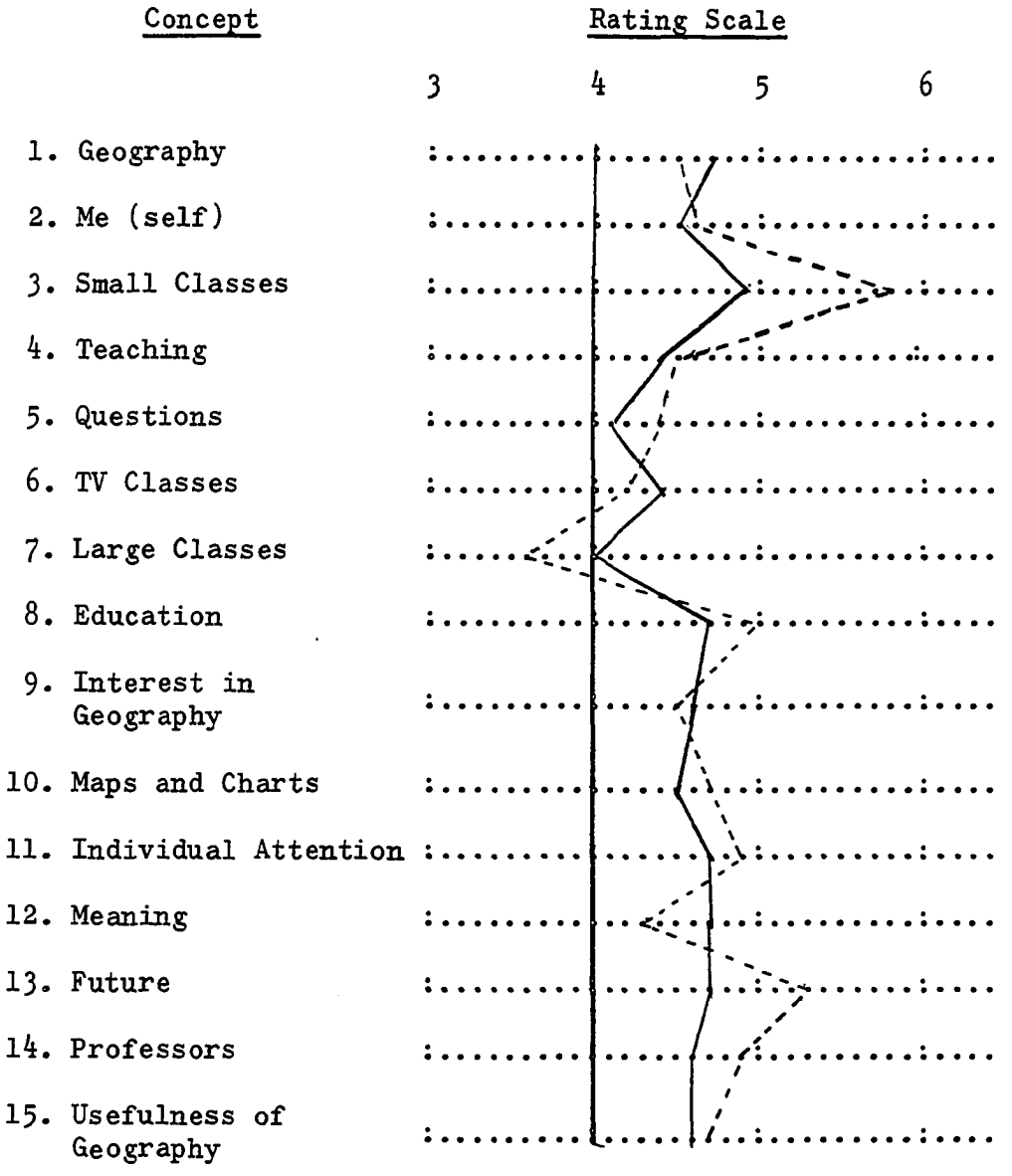
Table II and Figure 3 present the activity meaning dimension. Again there was no significant difference but the CCTV group ranked Geography, TV Classes, Large Classes, Interest in Geography, and Meaning more favorably than the non-TV group. The greatest difference in the students' activity meaning space was again on the concept Small Classes with the non-TV group ranking it more favorably. The concept Large Classes was again ranked "slightly unfavorable" by the non-TV group. Small Classes, Education, and Future were ranked "quite favorable" by the CCTV group and the remaining concepts were ranked as "slightly favorable" by both groups.

Table III and Figure 4 portray the strength or potency meaning dimension. Although there was no significant difference the CCTV group ranked Geography, Me (self), Small Classes, TV Classes, Interest in Geography, Maps and Charts, Individual Attention, Meaning, and Usefulness of Geography more favorably on the potency dimension than did the non-TV group. The greatest difference in potency meaning was on the concept TV Classes with the CCTV group ranking it more favorably.

TABLE II

Activity Meaning
GROUPS I AND II -- Test II Means

Concept	Group I	Group II	Direction of Difference	t-Value
1. Geography	4.700	4.522	+	.0300
2. Me (self)	4.541	4.583	-	.0076
3. Small Classes	4.925	5.780	-	.1310
4. Teaching	4.441	4.530	-	.0163
5. Questions	4.137	4.386	-	.0504
6. TV Classes	4.441	4.212	+	.0330
7. Large Classes	4.070	3.583	+	.0821
8. Education	4.670	5.045	-	.0745
9. Interest in Geography	4.600	4.515	+	.0130
10. Maps and Charts	4.450	4.666	-	.0351
11. Individual Attention	4.708	4.939	-	.0423
12. Meaning	4.729	4.325	+	.0742
13. Future	4.745	5.265	-	.0871
14. Professors	4.600	4.886	-	.0412
15. Usefulness of Geography	4.637	4.643	-	.0012



Group I -- TV Class ——
Group II - Non-TV Class----

Figure 3.--Activity Meaning -- Test II Means

TABLE III

Potency Meaning
GROUPS I AND II -- Test II Means

Concept	Group I	Group II	Direction of Difference	t-Value
1. Geography	5.000	4.590	+	.0939
2. Me (self)	4.845	4.401	+	.0947
3. Small Classes	5.954	5.075	+	.0261
4. Teaching	4.925	5.045	-	.0212
5. Questions	4.962	4.962	0	.0000
6. TV Classes	4.795	3.962	+	.1327
7. Large Classes	4.583	4.166	+	.0870
8. Education	5.087	5.712	-	.1174
9. Interest in Geography	4.879	4.636	+	.0380
10. Maps and Charts	4.733	4.651	+	.0150
11. Individual Attention	4.804	4.795	+	.0015
12. Meaning	4.837	4.537	+	.0543
13. Future	4.908	5.219	-	.0488
14. Professors	4.775	5.022	-	.0425
15. Usefulness of Geography	4.883	4.492	+	.0803

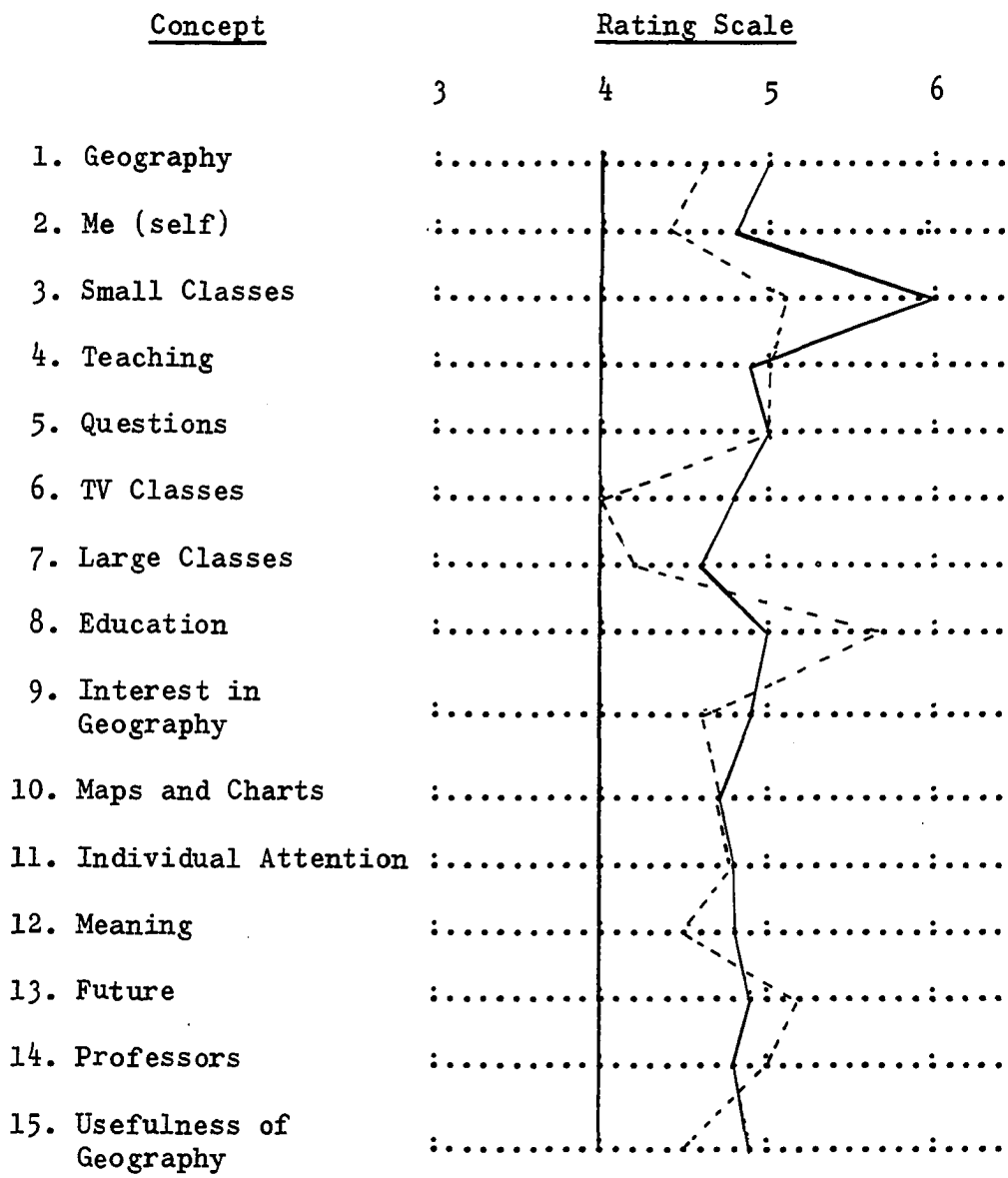


Figure 4.--Potency Meaning -- Test II Means

Two concepts, Maps and Charts and Individual Attention, were essentially the same for both groups. The concept Small Classes was ranked as "very favorable" by the CCTV group, and the remaining concepts were ranked by both groups as either "slightly" or "quite favorable."

Table IV and Figure 5 examine the total or composite attitudes of the two groups for each of the 15 concepts at the end of the semester. The total or composite attitude means include the three dimensions previously discussed. This is perhaps the most meaningful of all the data dealing with student attitudes in the study.

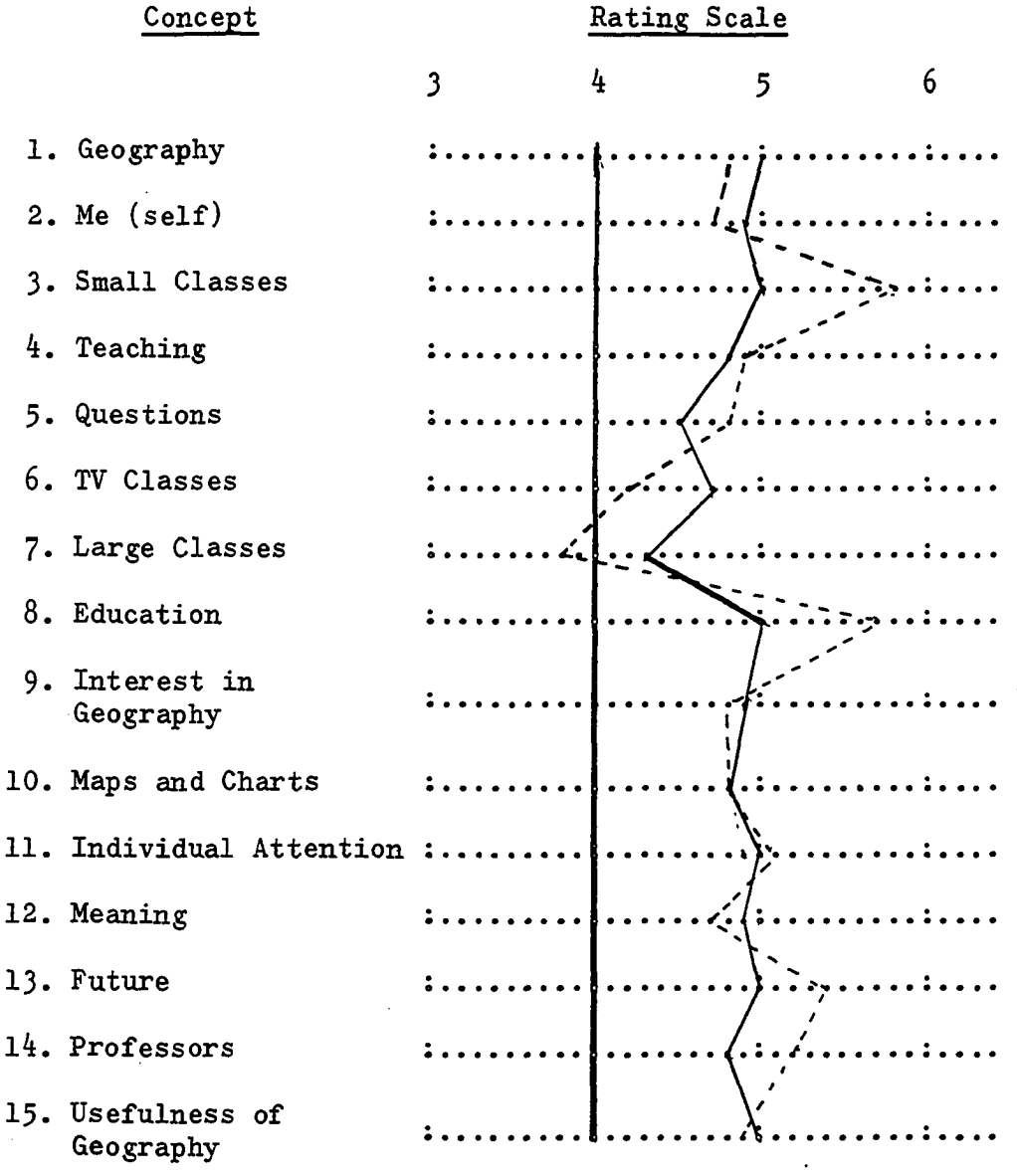
The critical ratio at 123 df is again 1.978 at the 0.05 level of confidence. The "t" values presented in Table IV show none to equal or exceed the critical ratio, therefore Hypothesis 4 which states that there is no significant difference in student attitudes between the two groups on each of the 15 concepts at the end of the semester must be accepted.

Some meaningful observations, however, can be made from the data. It can be observed on Table IV and Figure 5 that student attitudes on all concepts were closely related. Each concept was ranked as "slightly favorable" by the CCTV group except Education which was barely in the "quite favorable" category. The non-TV group ranked all concepts as "slightly favorable" or "quite favorable" except the concept Large Classes which was ranked as "slightly unfavorable." The following concepts were ranked more favorably by the CCTV

TABLE IV

Total Attitude Means
GROUPS I AND II -- Test II Means

Concept	Group I	Group II	Direction of Difference	t-Value
1. Geography	4.990	4.828	+	.0381
2. Me (self)	4.893	4.750	+	.0323
3. Small Classes	4.984	5.674	-	.1467
4. Teaching	4.783	4.944	-	.0318
5. Questions	4.525	4.792	-	.0614
6. TV Classes	4.747	4.176	+	.0959
7. Large Classes	4.350	3.765	+	.1187
8. Education	5.019	5.671	-	.1424
9. Interest in Geography	4.920	4.760	+	.0274
10. Maps and Charts	4.755	4.803	-	.0091
11. Individual Attention	4.959	5.116	-	.0340
12. Meaning	4.948	4.651	+	.0595
13. Future	4.980	5.441	-	.0893
14. Professors	4.836	5.174	-	.0624
15. Usefulness of Geography	4.956	4.911	+	.0096



Group I -- TV Class ——
Group II - Non-TV Class - - - -

Figure 5.--Total Attitude Means -- Test II

group: Geography, Me (self), TV Classes, Large Classes, Interest in Geography, Meaning, and Usefulness of Geography. The greatest difference in attitudes between the two groups was on the concept Small Classes with Group II ranking it more favorably. The eight concepts Geography, Me (self), TV Classes, Large Classes, Interest in Geography, Teaching, Maps and Charts, Individual Attention, Meaning, and Usefulness of Geography were ranked almost the same by both groups.

Summary

The semantic differential instrument yielded data for determining a mean for each of the three attitude dimensions being investigated (evaluative, activity, and potency) for each of the fifteen concepts as well as a composite or grand mean for each individual concept. An analysis and comparison of the means of Test I (pretest) and Test II (post-test) for each group revealed that no significant change took place in student attitudes during the semester. A comparison and analysis of the post-test means indicated no significant difference at the 0.05 confidence level between the two groups. The means of each of the dimensions for each concept as well as the composite mean for each concept were plotted to illustrate similarities and differences between the two groups.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine and analyze attitudinal differences of students taught introductory college geography by CCTV as compared with those who were taught by the classroom-discussion method. The subjects were 125 students enrolled in two sections of the course at East Central State College, Ada, Oklahoma. For the study of attitudinal differences the section taught by CCTV was designated Group I and the other taught by the classroom-discussion method as Group II. The two groups were taught by the same instructor during the spring term of the 1967-1968 academic year. At the beginning of the term the subjects did not differ significantly on mental ability, geography achievement, age, sex, and preattitudes; and they were therefore considered to be adequately matched for the attitudinal study.

A semantic differential attitude instrument based on Osgood's technique was developed for the study. This instrument has been used quite successfully by others who

have conducted research on student attitudes. The fifteen concepts chosen for the instrument relate to the discipline, to the method of instruction, and to general attitudes. The nine adjective pairs were taken from Osgood's original list with three pairs in each of the three dimensions (evaluative, activity, potency). The adjective pairs were rated on a scale of 1 to 7 with the higher number showing more favorable attitudes.

The instrument was administered to 81 subjects in Group I and 44 subjects in Group II during the first and last week of regular instruction of the semester. The post-attitudes were analyzed and compared on the evaluative, activity, and potency meaning dimensions for each of the 15 concepts as well as on each individual concept.

Four null hypotheses were formulated for the investigation. The first three stated that there is no significant difference in evaluative, activity, or potency meaning between the group of subjects who received introductory college geography by closed-circuit television and the group of subjects who received the course by the classroom-discussion method. The fourth is comprehensive and states that there is no significant difference in student attitudes between the two groups who were taught introductory college geography by closed-circuit television and by the classroom-discussion method.

The "t" test was used to determine if there were significant differences between the two groups at the end of the semester. The results showed no significant differences between the two groups at the 0.05 level of confidence on any of the three dimensions for the 15 concepts or on the composite attitude for each concept.

Findings

The four hypotheses of the investigation were tested by interpreting the results obtained from the "t" test at the 0.05 level of confidence. Based on the test results the investigation revealed the following findings:

1. There was no statistically significant difference in evaluative attitudes between the group of students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

2. There was no statistically significant difference in activity attitudes between the group of students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

3. There was no statistically significant difference in potency attitudes between the group of students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

4. There was no statistically significant difference in total attitudes between the group of students who were

taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

Conclusions

The population, as previously described, consisted of 125 students taught introductory college geography by the two methods of instruction. Conclusions drawn from the study are applicable to that population and generalizations to other situations are not appropriate.

The following conclusions are based on the evaluation of data obtained in this investigation:

1. There is no apparent difference in evaluative attitudes between students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

2. There is no apparent difference in activity attitudes between students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

3. There is no apparent difference in potency or strength attitudes between students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

4. There is no apparent difference in total attitudes between students who were taught introductory college geography by CCTV and those who were taught by the classroom-discussion method.

5. Under the conditions provided for the experiment, the CCTV method of teaching introductory college geography neither improved nor hindered attitudinal change, therefore instruction by CCTV is as acceptable as the classroom-discussion method for developing favorable attitudes toward the subject.

Recommendations for Geographic Education

Since there were no significant changes or differences in student attitudes between the two groups, geography departments and/or curriculum planners may select either instructional method. If a CCTV set-up is available and is needed to teach large numbers of students, it can be utilized effectively to teach introductory college geography.

From the results of this investigation the following specific recommendations are presented:

1. Since no significant differences in student attitudes were indicated from the data yielded by the instrument used in this study, additional attitudinal investigations should be conducted in relation to introductory college geography using the same type instrument but with different concepts and adjective pairs.

2. Since the same instructor taught both groups, it is recommended that research be done to determine if students taught by different instructors in each classroom situation would develop different attitudes toward the subject.

3. It is recommended that additional research be conducted to investigate the attitudes of students taught introductory college geography by different approaches, such as programmed instruction and team teaching to determine if these methods are as effective or more effective as CCTV for developing positive attitudes.

4. It is recommended that research be done to study attitudes of students in other disciplines taught by CCTV at East Central State College using a semantic differential similar to the one used in this investigation to determine if the same attitudinal pattern evolves.

5. It is recommended to chairmen of geography departments and curriculum planners who are using CCTV or are contemplating its use in the traditional manner that new teaching approaches be employed. Dressel's comments on the methodology of instruction via CCTV are pertinent, "It is true that most of the initial use of closed-circuit television has only brought the face of an instructor engaged in traditional patterns of activity to a larger number of students, but this is not an imaginative use of the medium."[67]

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[67]Paul L. Dressel, "The Planning of Instruction," Improving College and University Teaching, XIV, No. 2 (Spring, 1966), p. 69.

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APPENDICES

APPENDIX A

GROUP I (TV)

Subject	Age	Sex	Otis Gamma (Raw Scores)	Geography Achievement Scores
1.	18	M	74	68
2.	18	F	74	62
3.	20	M	72	60
4.	18	M	70	78
5.	22	M	70	71
6.	19	M	70	66
7.	18	M	70	65
8.	19	M	69	76
9.	21	F	67	51
10.	19	F	66	75
11.	22	F	66	57
12.	19	M	63	63
13.	36	F	63	63
14.	18	F	62	65
15.	19	F	62	47
16.	18	F	62	68
17.	34	M	61	73
18.	19	F	61	65
19.	19	M	61	68
20.	20	M	61	63
21.	18	M	61	58
22.	18	M	61	57
23.	19	F	60	54

APPENDIX A (Continued)
GROUP I

Subject	Age	Sex	Otis Gamma (Raw Scores)	Geography Achievement Scores
24.	20	F	60	46
25.	20	M	59	64
26.	19	F	59	72
27.	19	M	58	76
28.	21	M	58	56
29.	19	F	58	64
30.	26	M	58	75
31.	19	F	58	54
32.	18	F	58	67
33.	20	F	58	69
34.	25	M	56	83
35.	18	M	56	59
36.	18	M	56	66
37.	18	F	56	38
38.	20	M	56	63
39.	39	M	55	58
40.	19	F	55	56
41.	21	M	54	60
42.	44	F	54	69
43.	19	M	54	46
44.	19	M	53	57
45.	19	M	53	77
46.	27	M	53	66
47.	18	M	62	46
48.	19	F	52	57
49.	18	F	51	54
50.	18	M	51	52
51.	21	M	50	62
52.	18	M	50	58
53.	18	F	50	53

APPENDIX A (Continued)
GROUP I

Subject	Age	Sex	Otis Gamma (Raw Scores)	Geography Achievement Scores
54.	18	F	50	25
55.	20	F	48	61
56.	20	M	48	58
57.	19	F	48	51
58.	18	M	48	50
59.	18	F	47	67
60.	20	F	47	47
61.	18	M	45	72
62.	19	M	45	52
63.	34	F	45	44
64.	18	M	44	44
65.	20	F	44	52
66.	18	M	43	59
67.	18	M	43	54
68.	31	F	42	63
69.	37	M	42	63
70.	19	F	42	54
71.	18	M	41	55
72.	18	M	41	44
73.	29	F	40	67
74.	19	F	40	48
75.	20	F	40	31
76.	20	F	38	30
77.	18	F	37	42
78.	18	F	37	36
79.	27	F	36	40
80.	19	F	35	43
81.	19	M	33	47

APPENDIX B

GROUP II (Non-TV)

Subject	Age	Sex	Otis Gamma (Raw Scores)	Geography Achievement Scores
1.	18	F	71	70
2.	19	M	70	65
3.	20	F	67	55
4.	21	M	66	79
5.	18	M	66	39
6.	19	F	65	77
7.	18	F	65	67
8.	20	F	65	65
9.	21	M	63	76
10.	18	F	63	70
11.	18	M	61	82
12.	19	M	60	88
13.	19	M	59	73
14.	26	M	59	67
15.	18	F	59	63
16.	20	F	57	40
17.	18	M	57	59
18.	18	M	56	69
19.	19	F	56	42
20.	17	M	55	48
21.	19	F	55	63
22.	44	F	55	62
23.	20	M	55	61

APPENDIX B (Continued)
GROUP II

Subject	Age	Sex	Otis Gamma (Raw Scores)	Geography Achievement Scores
24.	18	F	54	59
25.	18	M	54	62
26.	22	M	54	61
27.	20	M	54	79
28.	19	F	53	62
29.	18	M	52	77
30.	19	M	51	77
31.	18	F	51	54
32.	19	F	51	40
33.	19	M	51	56
34.	19	M	50	63
35.	19	F	50	60
36.	20	M	49	48
37.	19	M	47	53
38.	18	M	47	41
39.	39	F	44	53
40.	18	M	43	48
41.	19	M	40	71
42.	19	F	33	47
43.	20	F	27	35
44.	18	F	25	48

APPENDIX C

FORMULAS

Mann-Whitney U Test

$$U = N_1N_2 + \frac{N_1(N_1+1)}{2} - T_1 \qquad \text{and then}$$

$$z = \frac{U - \frac{N_1N_2}{2}}{\sqrt{\frac{N_1N_2(N_1+N_2+1)}{12}}}$$

Where:

N_1 = Group I (Number)

N_2 = Group II (Number)

T_1 = Group I (Summed)

Chi Square Test

$$\chi^2 = \sum\frac{(O-E)^2}{E}$$

Where:

O = Observed

E = Expected

APPENDIX C (Continued)
FORMULAS

The "t" Test

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1+N_2-2}} \cdot \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}}$$

Where:

$\overline{X}_1$ and $\overline{X}_2$ are the means of the two samples

N_1 and N_2 are the number of subjects in Group I and Group II

APPENDIX D

Groups I and II

Test I -- t-Values

Concept	Evaluative	Activity	Potency
1. Geography	.0241	.0091	.0025
2. Me (self)	.0653	.0710	.0003
3. Small Classes	.0123	.0316	.0041
4. Teaching	.0669	.0644	.0715
5. Questions	.0189	.0717	.0139
6. TV Classes	.0253	.0412	.1017
7. Large Classes	.0381	.0349	.0759
8. Education	.0209	.0115	.0122
9. Interest in Geography	.0086	.0477	.0380
10. Maps and Charts	.0072	.0091	.0150
11. Individual Attention	.0496	.0458	.0091
12. Meaning	.0063	.0029	.0731
13. Future	.0282	.0224	.0131
14. Professors	.0052	.0373	.0281
15. Usefulness of Geography	.0065	.0524	.0616

APPENDIX E

Group I -- Evaluative Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	5.267	5.270	+	.0004
2. Me (self)	5.621	5.291	-	.0480
3. Small Classes	6.069	5.075	-	.1196
4. Teaching	5.728	4.983	-	.0986
5. Questions	5.102	4.475	-	.0812
6. TV Classes	4.551	5.004	+	.0451
7. Large Classes	3.646	4.395	+	.0798
8. Education	6.176	5.291	-	.1205
9. Interest in Geography	5.094	5.283	+	.0231
10. Maps and Charts	4.942	5.083	+	.0179
11. Individual Attention	5.646	5.366	-	.0447
12. Meaning	5.415	5.279	-	.0186
13. Future	6.049	5.286	-	.1190
14. Professors	5.440	5.113	-	.0379
15. Usefulness of Geography	5.637	5.350	-	.0364

APPENDIX E (Continued)

GROUP I -- Potency Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	4.724	5.000	+	.0526
2. Me (self)	4.691	4.845	+	.0276
3. Small Classes	5.024	4.954	-	.0120
4. Teaching	5.152	4.925	-	.0351
5. Questions	4.995	4.962	-	.0059
6. TV Classes	4.633	4.795	+	.0238
7. Large Classes	4.452	4.583	+	.0233
8. Education	5.580	5.087	-	.0806
9. Interest in Geography	4.650	4.879	+	.0365
10. Maps and Charts	4.794	4.733	-	.0098
11. Individual Attention	4.621	4.804	+	.0268
12. Meaning	4.917	4.837	-	.0134
13. Future	5.312	4.908	-	.0598
14. Professors	5.189	4.775	-	.0592
15. Usefulness of Geography	5.065	4.883	-	.0283

APPENDIX E (Continued)

GROUP I -- Activity Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	4.386	4.700	+	.0456
2. Me (self)	4.975	4.541	-	.0697
3. Small Classes	5.732	4.925	-	.1059
4. Teaching	4.880	4.441	-	.0742
5. Questions	4.485	4.137	-	.0578
6. TV Classes	4.382	4.441	+	.0073
7. Large Classes	3.748	4.070	+	.0454
8. Education	5.032	4.679	-	.0610
9. Interest in Geography	4.333	4.600	+	.0354
10. Maps and Charts	4.316	4.450	+	.0199
11. Individual Attention	4.893	4.708	-	.0293
12. Meaning	4.641	4.729	+	.0139
13. Future	5.288	4.745	-	.0856
14. Professors	5.037	4.600	-	.0546
15. Usefulness of Geography	4.835	4.637	-	.0334

APPENDIX F

GROUP II -- Potency Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	4.712	4.590	-	.0277
2. Me (self)	4.689	4.401	-	.0629
3. Small Classes	5.045	5.075	+	.0074
4. Teaching	4.780	5.045	+	.0556
5. Questions	4.931	4.962	+	.0066
6. TV Classes	4.068	3.962	-	.0190
7. Large Classes	4.075	4.166	+	.0200
8. Education	5.416	5.712	+	.0599
9. Interest in Geography	4.446	4.636	+	.0313
10. Maps and Charts	4.871	4.651	-	.0456
11. Individual Attention	4.666	4.795	+	.0310
12. Meaning	4.575	4.537	-	.0081
13. Future	5.386	5.219	-	.0290
14. Professors	5.030	5.022	-	.0015
15. Usefulness of Geography	4.696	4.492	-	.0419

APPENDIX F (Continued)

GROUP II -- Activity Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	4.439	4.522	+	.0160
2. Me (self)	4.606	4.583	-	.0046
3. Small Classes	5.901	5.780	-	.0273
4. Teaching	4.553	4.530	-	.0044
5. Questions	4.143	4.386	+	.0622
6. TV Classes	4.106	4.212	+	.0173
7. Large Classes	3.537	3.583	+	.0085
8. Education	5.090	5.045	-	.0093
9. Interest in Geography	4.628	4.515	-	.0203
10. Maps and Charts	4.265	4.666	+	.0710
11. Individual Attention	4.636	4.939	+	.0580
12. Meaning	4.628	4.325	-	.0763
13. Future	5.166	5.265	+	.0177
14. Professors	4.825	4.886	+	.0123
15. Usefulness of Geography	4.575	4.643	+	.0144

APPENDIX F (Continued)

GROUP II -- Evaluative Meaning

Concept	Test I Mean	Test II Mean	Direction of Change	t-Value
1. Geography	5.393	5.371	-	.0049
2. Me (self)	5.272	5.265	-	.0014
3. Small Classes	6.000	6.166	+	.0352
4. Teaching	5.378	5.275	-	.0205
5. Questions	5.000	5.030	+	.0062
6. TV Classes	4.318	4.356	+	.0046
7. Large Classes	3.946	3.545	-	.0557
8. Education	6.083	6.257	+	.0442
9. Interest in Geography	5.037	5.128	+	.0143
10. Maps and Charts	4.992	5.090	+	.0152
11. Individual Attention	5.386	5.613	+	.0453
12. Meaning	5.378	5.090	-	.0515
13. Future	5.909	5.840	-	.0132
14. Professors	5.409	5.613	+	.0391
15. Usefulness of Geography	5.598	5.598	0	.0000

APPENDIX G

The Semantic Differential Attitude Instrument

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The following directions were printed on the cover sheet of the semantic differential attitude instrument:

> On the following pages you are asked to rate certain concepts by placing a mark between the two adjectives at the point which best represents your feeling toward the item at the top of each page. Your rating of each item will be held in strict confidence and will absolutely have no affect on your grade in this course or any other course.

APPENDIX G (Continued)

GEOGRAPHY

1. Fair	___	___	___	___	___	___	___	Unfair ___
2. Valuable	___	___	___	___	___	___	___	Worthless ___
3. Unpleasant	___	___	___	___	___	___	___	Pleasant ___
4. Active	___	___	___	___	___	___	___	Passive ___
5. Fast	___	___	___	___	___	___	___	Slow ___
6. Tense	___	___	___	___	___	___	___	Relaxed ___
7. Weak	___	___	___	___	___	___	___	Strong ___
8. Hard	___	___	___	___	___	___	___	Soft ___
9. Deep	___	___	___	___	___	___	___	Shallow ___

APPENDIX G (Continued)

ME (SELF)

1. Fair	____:____:____:____:____:____:____	Unfair ___
2. Valuable	____:____:____:____:____:____:____	Worthless___
3. Unpleasant	____:____:____:____:____:____:____	Pleasant ___
4. Active	____:____:____:____:____:____:____	Passive ___
5. Fast	____:____:____:____:____:____:____	Slow ___
6. Tense	____:____:____:____:____:____:____	Relaxed ___
7. Weak	____:____:____:____:____:____:____	Strong ___
8. Hard	____:____:____:____:____:____:____	Soft ___
9. Deep	____:____:____:____:____:____:____	Shallow ___

APPENDIX G (Continued)

SMALL CLASSES

1. Fair ____:____:____:____:____:____:____ Unfair ___
2. Valuable ____:____:____:____:____:____:____ Worthless___
3. Unpleasant____:____:____:____:____:____:____ Pleasant ___
4. Active ____:____:____:____:____:____:____ Passive ___
5. Fast ____:____:____:____:____:____:____ Slow ___
6. Tense ____:____:____:____:____:____:____ Relaxed ___
7. Weak ____:____:____:____:____:____:____ Strong ___
8. Hard ____:____:____:____:____:____:____ Soft ___
9. Deep ____:____:____:____:____:____:____ Shallow ___

APPENDIX G (Continued)

TEACHING

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___

APPENDIX G (Continued)

QUESTIONS

1.	Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2.	Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3.	Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4.	Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5.	Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6.	Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7.	Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8.	Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9.	Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___

APPENDIX G (Continued)

TV CLASSES

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___

APPENDIX G (Continued)

LARGE CLASSES

1. Fair	___	___	___	___	___	___	___	Unfair ___
2. Valuable	___	___	___	___	___	___	___	Worthless ___
3. Unpleasant	___	___	___	___	___	___	___	Pleasant ___
4. Active	___	___	___	___	___	___	___	Passive ___
5. Fast	___	___	___	___	___	___	___	Slow ___
6. Tense	___	___	___	___	___	___	___	Relaxed ___
7. Weak	___	___	___	___	___	___	___	Strong ___
8. Hard	___	___	___	___	___	___	___	Soft ___
9. Deep	___	___	___	___	___	___	___	Shallow ___

APPENDIX G (Continued)

EDUCATION

1. Fair	____	____	____	____	____	____	____	Unfair ___
2. Valuable	____	____	____	____	____	____	____	Worthless___
3. Unpleasant	____	____	____	____	____	____	____	Pleasant ___
4. Active	____	____	____	____	____	____	____	Passive ___
5. Fast	____	____	____	____	____	____	____	Slow ___
6. Tense	____	____	____	____	____	____	____	Relaxed ___
7. Weak	____	____	____	____	____	____	____	Strong ___
8. Hard	____	____	____	____	____	____	____	Soft ___
9. Deep	____	____	____	____	____	____	____	Shallow ___

APPENDIX G (Continued)

INTEREST IN GEOGRAPHY

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair	___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless	___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant	___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive	___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow	___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed	___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong	___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft	___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow	___

APPENDIX G (Continued)

MAPS AND CHARTS

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___

APPENDIX G (Continued)

INDIVIDUAL ATTENTION

1. Fair	___	___	___	___	___	___	___	Unfair ___
2. Valuable	___	___	___	___	___	___	___	Worthless ___
3. Unpleasant	___	___	___	___	___	___	___	Pleasant ___
4. Active	___	___	___	___	___	___	___	Passive ___
5. Fast	___	___	___	___	___	___	___	Slow ___
6. Tense	___	___	___	___	___	___	___	Relaxed ___
7. Weak	___	___	___	___	___	___	___	Strong ___
8. Hard	___	___	___	___	___	___	___	Soft ___
9. Deep	___	___	___	___	___	___	___	Shallow ___

APPENDIX G (Continued)

MEANING

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___

APPENDIX G (Continued)

FUTURE

1. Fair	____	____	____	____	____	____	____	Unfair ___
2. Valuable	____	____	____	____	____	____	____	Worthless___
3. Unpleasant	____	____	____	____	____	____	____	Pleasant ___
4. Active	____	____	____	____	____	____	____	Passive ___
5. Fast	____	____	____	____	____	____	____	Slow ___
6. Tense	____	____	____	____	____	____	____	Relaxed ___
7. Weak	____	____	____	____	____	____	____	Strong ___
8. Hard	____	____	____	____	____	____	____	Soft ___
9. Deep	____	____	____	____	____	____	____	Shallow ___

APPENDIX G (Continued)

PROFESSORS

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair	___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless	___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant	___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive	___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow	___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed	___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong	___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft	___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow	___

APPENDIX G (Continued)

USEFULNESS OF GEOGRAPHY

1. Fair	___	: ___	: ___	: ___	: ___	: ___	: ___	Unfair ___
2. Valuable	___	: ___	: ___	: ___	: ___	: ___	: ___	Worthless ___
3. Unpleasant	___	: ___	: ___	: ___	: ___	: ___	: ___	Pleasant ___
4. Active	___	: ___	: ___	: ___	: ___	: ___	: ___	Passive ___
5. Fast	___	: ___	: ___	: ___	: ___	: ___	: ___	Slow ___
6. Tense	___	: ___	: ___	: ___	: ___	: ___	: ___	Relaxed ___
7. Weak	___	: ___	: ___	: ___	: ___	: ___	: ___	Strong ___
8. Hard	___	: ___	: ___	: ___	: ___	: ___	: ___	Soft ___
9. Deep	___	: ___	: ___	: ___	: ___	: ___	: ___	Shallow ___