

1974

Learner variables related to television and lecture methods of learning

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Learner variables related to television
and lecture methods of learning

by

Helen Y. Tien

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Graduate Faculty in Partial Fulfillment of
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Iowa State University
Ames, Iowa

1974

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INTRODUCTION

As the development of educational media technology has increased, provision for individual differences and learner variables have been persistent concerns in the organization of instructional materials and settings. Efforts to identify factors which relate to these differences and to learning styles appropriate for various media presentations have had limited success when these variables have been investigated.

Briggs (1968), p. 160), in discussing this topic in relation to educational media suggested:

"While no one learning variable ... can yet be said to outweigh all others in importance, the following issues do seem worthy of exploration when searching for the key characteristics of media and materials which may eventually bring about effective individual or group situations: sensory mode; i. Q.; special aptitudes; entering competencies;"

The effects of television have also been the focus of research for the past decade. Television's role in schools can vary from a fully equipped studio to a single-room closed-circuit TV system. From a technical point of view, the advent of video/cassette systems has expanded the range of possibilities for highly flexible instructional materials. Torkelson and Driscoll (1968, p. 137) foresaw the possibility of putting self-paced programmed instruction on television:

"With the shift of popular interest from television to programmed instruction, it was inevitable that studies would be done on the combination of the two media."

Need for the Study

There is a need to study individual learner variables in relation to the instructional media and modes of instructional presentation, instead of just exploring the comparative value of different media.

The recommendation that researchers should study individual differences and interrelationships between psychological factors, was made as early as 1930 by Weber, and the same idea has encouraged considerable research thereafter. For example, Briggs (1968, p. 172) states:

"... one does not hope to find evidence for matching a medium with a person or subject matter area; instead one seeks to consider learner characteristics while analyzing tasks with respect to the optimum kind of stimuli and learning conditions ... which can be provided by various media ... "

Haskel (1971, p. 288) emphasized the identical idea by stating:

"Research undertakings which have been concerned with examining the effects of individual learner differences as they interact with various instructional methods provide some indication that identification of such learner characteristics may be useful for prescribing different instructional approaches for different individuals."

In the past two decades voluminous studies have explored programmed instruction and some of the learner variables involved. However, the results have been inconsistent among similar studies (Briggs, 1968).

Numerous studies have also been done on instructional television, Stickell (1963) reviewed and analyzed 250 comparison studies comparing televised and conventional instructional methods. He concluded that 217 were "uninterpretable" because of the weakness of research design.

According to Knowlton (1964) most research in media has failed due to design weaknesses. He concluded that the variables under investigation were the addition of a medium but not the message variable.

Findings such as those cited above prompted this study which examine selected learner variables in relation to video/cassette, self-paced instruction.

Purpose of the Study

The purpose of the study was to determine how various learner variables are related to teletutorial and lecture instructional methods. Answers to the following specific questions were sought.

1. Are there any initial differences among students in regard to media background art background, GPA, and preference for learning method?
2. Is there any difference in achievement following teletutorial instruction and conventional lecture instruction?
3. Does the student's preference for learning differ as a result of the exposure to two different instructional conditions?
4. Do the attitudes of the students differ as a result of the exposure to the two different instructional methods (teletutorial vs lecture)?
5. What learner variables influence achievement under selected instructional conditions?
6. What learner variables influence attitudes under selected instructional conditions?

Educators agree that individual differences are important factors in the success of any educational process. Thus, the investigation of learner variables in relation to teletutorial and lecture instructional methods was the purpose of this study. The goal of this study was to be able to predict students' achievement and attitudes by the independent variables studied. These predictions could then be used to assign future students to classes to maximum achievement and satisfaction. In addition, since very little is known about learner behavior, it was the researcher's hope that this study would contribute to an understanding of complex learning behaviors in classes.

Definition of Terms

The following definitions were used in this study:

1. Teletutorial - A video/cassette tape teaching format (designed for Education 305B classes) which allows students to backtrack over explanations as many times as they want, permitting students to learn at their own pace. A worksheet is provided to answer questions asked in the instruction.
2. Individualized Instruction - The use of programmed instruction or audiovisual materials and techniques to provide students the opportunity to master the sequential subject matter individually. It is organized through consideration of the student's need, learning rate, and ability to master new concepts. Feedback is necessary.

3. GPA - Cumulative average of course grades, based on a 4 point scale.
4. I. R. C. - Instructional Resources Center, Iowa State University.

The Center contains audiovisual equipment and materials for students in Education.

REVIEW OF LITERATURE

The preceding chapter stated that learner variables are important and must be investigated in relation to the instructional media and learning methods applied. This chapter cites literature and research pertinent to this study. In the literature review, three general parts are relevant:

1. Relationships between learner variables and educational media.
2. Programmed instruction, and its effects on attitudes, personality, and achievement.
3. Instructional television, and its effects on attitudes, personality, and achievement.

Relationship Between Learner
Variables and Educational Media

Saettler (1968) felt that media research traditionally has had very little relevance to instructional design. He stated (p. 118):

"Obviously, media comparison studies have predominated."

A comprehensive explanation on the "media comparison study" was given by Volker, where media is used for the experimental group and the traditional teacher lecture method is used for the control group.

Hundreds of such comparison studies have been done and in most cases they resulted in the monotonous answers of "no significant differences," Saettler thus recommended matching media to the requirements of a learner.

As the consequence of the shortcomings of media research, other recommendations were made that offered interesting possibilities, these included:

- a) the utilization of multimedia (Meierhenry, 1962);
- b) the investigation of teacher-student medium interactions, use of multimedia systems, and self-instruction teaching systems (Smith, Schagrin, and Poorman, (1967);
- c) studying of individual differences (Briggs, 1968).

It is Brigg's (1968, p. 160) belief that educators have long been seeking ways that learners can attain a comparative satisfactory level of achievement in a reasonable amount of time, and it is not surprising to accept the possibility of failing this purpose by using group teaching methods as well as a fixed set of teaching materials.

As to the reason that educators are still uncertain about the learners needs, Briggs (1968) offers no solutions for methods of making group presented media meet individual needs. He does feel that attention to learning variables might yield insight into individual learner needs.

Individual difference variables, defined as "aptitude" by Snow and Solomon (1968), is a "general term that implies a large number of characteristics" (Volker, 1970, p. 22). Snow and Solomon hoped that the media specialists would increasingly consider the inclusion of aptitude variables in their thinking and work.

To emphasize the complexity of the interaction of learning, Popham (1971) pointed out that effective instruction represents a series of

subtle interactions and one of the elements is the student's characteristics.

Programmed Instruction, and its Effects on
Attitudes, Personality, and Achievement

With efforts to identify the learner variables or student differences, the notion of individualized instruction has become popular. Programmed instruction, which incorporates the factors of individual variables, has emerged as one center of attention in media research activities since 1962.

The Center for Programmed Instruction (1964) made a survey in 3000 school districts on the use of programmed instruction in the U. S. Major findings related to the present study include the following:

1. Programmed instruction was dependent on commercially made programs.
2. Programmed instruction was used earlier in large school systems and in most cases only for students of above average or average I. Q.
3. Programmed instruction was most widely used in the field of mathematics.

Leith (1963) reviewed the studies dealing with programmed instruction, with or without teaching machines, and reported that programmed instruction generally was as effective as conventional instruction. There were no differences in effectiveness noted between programmed texts and teaching machines.

Eigen (1963) conducted a study involving an experimental group of 39 students who were using teaching machines and a control group using a programmed text. He found that high ability students had favorable attitudes toward programmed materials. Yet the attitude toward the presentation method or materials did not show any influence on achievement. Frey, Shimabukuro, and Woodruff (1967) as cited in Torkelson, and Driscoll (1968), studied attitude changes in programmed instruction as related to achievement and found that when negative attitudes toward programmed instruction increased, achievement declined. They did not recommend the use of programmed materials continuously or intensively throughout the course because programmed instruction does have its saturation point. Instead, they felt that other appropriate modes of instruction would be a relief.

Knight (1966) investigated the influence of achievement motivation and assessed test anxiety on performance in programmed instruction. He used a quasi-projective questionnaire measure of achievement anxiety and an achievement pretest as measurements. The reported findings were:

1. Compared with the low achievement-motivated students, the high-achievement-motivated students performed better and learned more, considering learning time, number of incorrect responses, and retention of the knowledge.
2. Compared with low-test anxiety students, high-test-anxiety students worked faster with fewer errors, yet no higher retention scores were shown.

Gotkins's (1966) paper merits attention because he believes program writing is the critical issue. He believes that machines can exert "psychological control" over us, which can be more restrictive than the limitations of the machine. If we can "live" with a piece of equipment we can learn to utilize its unique attributes in creative ways. Thus, challenging and creative programming can make machines flexible enough to adapt to teaching situations.

With the belief that research can point out ways to write more effective programs, many experiments were conducted related to program characteristics - such as pacing of instruction, sequencing of instruction, and differences between paired and individual learning.

Gropper and Kress (1965) as cited in Briggs (1968), found that programmed instruction could be both effective and efficient. They suggested that as some students are fast workers and some are slower workers, when fixed-paced presentations are offered in group settings, effectiveness and efficiency can be obtained by offering more than one program source. They also suggested that self-pacing can be nonadaptive to student's needs.

Doty and Doty (1964) investigated the effectiveness of programmed instruction related to five learner characteristics: Grade point average (GPA), creativity, achievement need, social need, and attitude toward programmed instruction. They found that the effectiveness of programmed instruction varied as a function of student personality variables. There were significant correlations between achievement tests and GPA, creativity, social need, and the programmed unit. When

using partial correlation to hold GPA constant, social need was shown as an important variable.

Jelden (1972) conducted a study predicting success in an individualized multi-media instruction setting by using aptitude and personality variables. He reported that Edwards Personal Preference Schedule (EPPS) and General Ability Test Battery (GATB) were important predictors. However, the best single predictor was general intelligence. He felt that media worked well for most of the students and he saw no critical differences between using verbal or visual media for the high achievers since they achieve rather successfully by either medium.

Jamison, Suppes, and Wells (1974) summarized the reviews of programmed instruction research and concluded that although there are often no significant differences in achievement relating the comparison of programmed instruction and conventional lecture instruction, some studies have reported a saving in student time and that is an index of success. They summarize Schramm, 1964, and Lange's, 1972, findings on the comparison studies between programmed instruction (PI) and traditional lecture instruction (TI), (see Table 1).

They further state (p. 41): "PI is generally as effective as TI and may result in decreasing the amount of time required for a student to achieve specific educational goals."

Table 1. Results of comparisons between programmed instruction and traditional lecture instruction

Author(s) of study	No. of comparisons	No. significant differences	Programmed instruction more effective	Traditional lecture instruction more effective
Schramm (1964)	36	18	17	1
Lange (1972)	112	55	46	11

Instructional Television, and its Effects
on Attitudes, Personality, and Achievement

Voluminous research has been produced in the past decade on the utilization of instructional television. Barrington (1968) surveyed 90 research reports relating to television teaching in the U. S. and in other countries. He concluded that:

1. There is no significant difference in achievement between teaching by the television method and conventional methods.
2. Television lessons do hold student attention.
3. The optimum length of a lesson is approximately 25 minutes and it is important to have the narration related with the visuals.
4. When students are involved in responding during the lesson, retention is improved.

5. Younger and less able students are more enthusiastic toward television lessons.

In order to explore and to examine television potential, Brish (1965) reported the findings on the closed circuit television programs in 45 elementary and junior high schools. He stated that (p. 228):

- "1. Pupil achievement can improve significantly when television is consistently used as a teaching aid.
2. Television is especially useful as an instructional aid to add new learning experiences to the school program. It does not replace the teacher or substitute techniques and procedures which would eliminate regular classroom learning activities and personal teacher-pupil relationships.
3. The problem of finding and retaining top quality teachers is eased.
4. Television changes the role of the classroom teacher and makes him - along with the studio teacher - part of a teaching team.
5. Television brings greater equality of opportunity for all pupils."

Many different subject areas have been studied in comparing televised methods and conventional methods. For example: Alexander (1963) conducted a study in a fundamental mathematical concepts course and found no difference in mean achievement between the group which received television instruction and the group which received lectures. Kaplan (1966) used a televised program in health education classes, involving a comparison of conventional teaching method and television problem-solving method. The finding was that no significant differences were shown in test scores; however, the problem-solving group showed higher gains in problem-solving abilities. Barrington (1965), comparing teaching elementary science by television and other methods, reported no

significant differences between the achievement of a television laboratory group and a conventional laboratory group. Yet the television/class group achieved significantly higher than conventional classroom group.

Students' and teachers' attitudes toward television have also been investigated. Gottschalk (1965) compared a conventional and a television method of teaching a foreign language in order to investigate students' attitudes toward television. He found that 76 percent of the experimental group felt that they learned more. The disadvantages listed by students included "general impersonality, impossibility of question asking, and lack of student participation."

Guba and Snyder (1965) used a sample of 72 elementary schools (members of the Midwest Program on Airborne Television Instruction) to study teachers' attitudinal structure and self-perception as related to utilizing instructional television. The conclusions (p. 19) drawn included:

1. The patterns of utilization of instructional television are conventional and stereotypic.
2. The utilization patterns were different between users' actual employment of television and nonusers' imagining how they would employ it.

Westley and Jacobson, 1963, reported the striking findings that a television-taught group tended to rate the teacher more highly than the non-television group. The non-television group rated their textbook more favorable than the television-taught group, and the television group rated the television worksheets more highly than their textbooks. Fritz and

Massialas (1964) studied teachers attitude toward television lessons on history and concluded those teachers were "approving" the use of the Midwest Project for Airborne Television Instruction (MPATI) and willing to maintain the structure and format of the program although the program showed a constricting effect on the teachers' conventional domain.

Another study related to the effects of utilization of MPATI upon the attitudes of teachers and students at the elementary and secondary levels was done by Haraway, Beymer, and Engbretson (1963). The conclusions were that:

1. The overall attitudinal reaction toward television instruction was neutral and did not show change after the treatment.
2. No consistent trends were found in the relationship between grade level and attitude.
3. Secondary level students' attitudes were influenced by the subjects and method of presentation in which television was used.

Chu and Schramm's (1967) survey covered 421 television and lecture comparison studies. Table 2 reports the comparisons between instructional television and conventional lecture instruction. Table 3 indicates the effectiveness of instructional television and conventional lecture instruction by subject areas.

Jamison, Suppes, and Wells (1974) examined Dubin and Hedley's (1969) review also with respect to achievement and state (p. 35):

"Dubin and Hedley (1969) provided a more detailed survey of the effectiveness of ITV at the college level. They reported on 191 comparisons of which 102 favored ITV and 89 favored TI, although most of the differences were insignificant at standard levels of statistical significance."

Table 2. Results of 421 comparisons between instructional television and conventional teaching (Chu and Schramm 1967, p. 13)

Level	No significant difference	ITV more effective	CT more effective
Elementary	50	10	4
Secondary	82	24	16
College	152	22	28
Adult	24	7	2
	<u>308</u>	<u>63</u>	<u>50</u>

Table 3. Results of 421 comparisons between instructional and conventional teaching by subject areas (Chu and Schramm 1967, p. 17)

Subject	Number of comparisons	Percentage in which TV groups did as well or better than conventional groups
Mathematics	56	89.2
Science	100	86.0
Social Studies	77	89.6
Humanities	45	95.5
Languages	77	88.3
Skills	26	96.1
Miscellaneous	40	75.0

In addition to achievement, Chu and Schramm's (1967) conclusions concerning attitudes are summarized as follows:

- "15. Inserting questions in a television program does not seem to improve learning, but giving the students a rest pause does. (p. 56)
- 29. Students will learn more from instructional television under motivated conditions than under unmotivated conditions. (p. 83)
- 36. Note-taking while viewing instructional television is likely to interfere with learning if time for it is not provided in the telecast. (p. 107)
- 37. Teachers and pupils are more favorable toward the use of ITV in elementary school than in secondary school and college.
- 40. At the college level, students tend to prefer small discussion classes to television classes, television classes to large lecture classes. (p. 119)
- 41. There is evidence of a Hawthorne effect among students beginning to use instructional television, but no firm evidence that attitudes toward the medium necessarily improve or worsen with time. (p. 122)
- 43. Liking instructional television is not always correlated with learning from it. (p. 123)"

Jamison, Suppes, and Wells (1974) summarize Dubin and Hedley's (1969) review related with attitude toward ITV and state (p. 37):

"Dubin and Hedley also reviewed a number of studies on the attitudes of college students toward ITV. Students have more favorable attitudes toward ITV after they have experienced it than before; after exposure to ITV, half to two-thirds of the students surveyed reported attitudes that were favorable (as opposed to neutral or unfavorable). Asked whether they would choose ITV or TI, less than one-third indicated a preference for ITV... . If, however, the choice was between ITV and TI in the form of a large lecture course, typically over half the students preferred ITV."

To conclude the research literature on ITV, Jamison, Suppes, and Wells (1974) say (p. 38):

"ITV can teach all grade levels and subjects matters about as effectively as TI, though some evidence indicates that it performs relatively better at lower grade levels. A significant fraction of teachers and students have initially negative attitudes toward ITV; these negative attitudes tend to lessen but not necessarily disappear, with time and appropriate administrative behavior."

Turning from achievement and learner variables, some research interest has been exhibited in the combination of the instructional television and programmed instruction. Gryde (1966) in his review stated that instructional television and programmed instruction can be used effectively together. But, he cautions that to make instructional television effective you must provide the student with self-pacing, feedback to the student and to the instructor, and active response.

Komoski (1967) investigated creating group-paced programmed television instruction which was in a short series of geography lessons. These lessons were using only the voice of the instructor to direct attention to certain visual teaching displays. The conclusion was that the use of television need not be limited to enrichment programming and the results had demonstrated the efficacy of group-paced, programmed television.

Summary

To summarize the results of the research in programmed instruction, the writer concluded that in most of the cases there were no significant differences found in achievement between the programmed instruction method and conventional lecture methods. Also, the research findings indicated no substantial difference in the use of television instruction versus conventional lecture instruction. It seems to be significant that programmed instruction has the tendency to save time when compared to conventional lecture methods; in addition, programmed instruction has the advantage of considering individual learning differences. Most

of the research exhibited that teachers and students are more favorable toward the use of instructional television under motivated conditions although students' attitude toward TV is not always correlated with achievement.

METHODS OF PROCEDURE

This study was designed to determine if a teletutorial instructional method in a college media course was more effective than a lecture method. Learner variables, and the relationships between learner variables and achievement, were also investigated. The various measures administered included achievement tests, personality scale, attitude scales, and background inventories.

Sample Selection

The sample used in this study was students enrolled in 10 sections of Education 305B classes from total of fourteen sections enrolled in Winter Quarter, 1974 at Iowa State University. The sections were chosen at random. The study lasted eight weeks. At the beginning of the quarter, the total number of students involved was 174; at the completion of the study, the number had dropped to 159. The two main reasons for the loss of fifteen subjects were: a) some students dropped the course, and b) some were absent during the data collection. Each student was treated as an independent unit resulting in a total sample size of 159.

Design

The study consisted of two groups. The total period of the study lasted eight weeks. The first week and the fifth week were orientation, equipment practicum, and administration of the test batteries. The materials presented and included in the study were covered in six weeks.

The design involved the following steps:

1. Randomly assign available ten classes to group 1 or group 2.
2. Administer the first test battery to both groups prior to the treatment.
3. Expose groups to one of two different treatments - teletutorial or lecture.
4. At the end of the fourth week, administer the second test battery to both groups.
5. Shift the treatments:
 Group 1: teletutorial \longrightarrow lecture
 Group 2: lecture \longrightarrow teletutorial.
6. At the end of the eighth week, administer the third test battery to both groups and compare in order to determine the effects of the treatments related with learner variables.

The schematic presentation of this design was:

Group 1	O_1	T	O_2	L	O_3
Group 2	O_1	L	O_2	T	O_3
[complete] week	1		4		8

O_1 = first test battery

L = lecture treatment method

T = teletutorial treatment method O_2 = second test battery

O_3 = third test battery

Instructor Assignment

Four instructors were involved. Each of three taught one teletutorial and one lecture section; the fourth instructor taught two teletutorial and two lecture sections. Each teacher's assignment is shown in Table 4.

Table 4. Teacher's assignment

Group 1			Group 2		
Section Number	Teacher	Students Number of	Section Number	Teacher	Students Number of
2	A	19	3	C	15
14	C	16	4	A	18
15	B	15	5	D	17
18	A	18	7	B	16
20	D	11	11	A	14
Total = 79			Total = 80		

Course Content

Education 305B is an introductory course in educational media. Six main subject matter topics have been taught by the lecture-classroom demonstration-laboratory method for several years:

1. Displays and handouts,
2. Behavioral objectives and scripting,
3. Still photography,

4. Motion photography and video taping,
5. Audio taping,
6. Overhead transparencies.

Since video-cassettes were introduced into the classroom, a new teaching format for Education 305B was developed in 1973. Color video-cassettes ranging from 25 minutes to 40 minutes in length were developed for each topic. The content paralleled the lecture content; i.e., the visuals in the tape of each lesson included different segments of different media such as super 8mm films, slides, transparencies, flip charts and audio tapes.

Within the concept of individualized instruction, each topic was developed according to structured units. Worksheets (Appendix A), which usually consisted of four or five essay questions, accompanied each lesson; immediate reinforcement was provided to allow students to realize the need for reviewing the explanation in the lesson when necessary. The production techniques, as well as the laboratory work producing the media, were not included in the tapes. (See Table 5).

In the study, five sections of students were randomly assigned to group 1 and five sections of students were assigned to group 2. Group 1 was first taught by the teletutorial method while group 2 was first taught by the lecture method. After four weeks, the instructional methods were shifted between the two groups for the second half of the study. Thus, both group 1 and group 2 were exposed to both the teletutorial instruction method and lecture method during the study. The only difference was the order of the treatment of the two methods. The time schedule for the study is outlined

in Table 6.

Table 5. The three phases of the two instructional methods.

Teletutorial Method	Lecture Method
1. Teletutorial tape -- Students viewed a video-cassette tape each week before coming to class, completing a worksheet as preparation for classroom demonstration.	1. Lecture -- The content of the lecture was the same as on the video-cassette tape. The time involved in the lecture was equal to the video-cassette tape. Questions on the worksheet were discussed.
2. Classroom demonstration -- Class instruction in ways of using equipment, production techniques.	2. Classroom demonstration -- Class instruction in ways of using equipment, and production techniques.
3. Laboratory work -- producing media.	3. Laboratory work -- Producing media.

Table 6. The schedule of treatment

Group 1			Group 2		
Week	Method	Class Management	Week	Method	Class Management
1	Orien- tation (Not includ- ed in the study)	Administer the first test battery. Viewing tape No. 1. "Introduction and Visual Literacy" including orientation of the course and demonstration on the use of video-cassette equipment.	1	Orien- tation (Not includ- ed in the study)	Administer the first test batteries. Lecture on Lesson No. 1 "Introduction and Visual Literacy" and orientation of the course.
2	Teletu- torial	Collect video-cassette tape worksheet No. 2. "Displays and Handouts." Demonstrate using dry mount press and ditto machine. Free time for lab production work.	2	Lecture	Lecture on Lesson No. 2 "Displays and Handouts." Demonstrate using dry mount press and ditto machine. Free time for lab production work.
3	Teletu- torial	Collect video-cassette tape worksheet No. 3. "Behavioral Objectives." Showing collections of scripts. Free time for studying and practicing scripts.	3	Lecture	Lecture on Lesson No. 3 "Behavioral Objectives." Showing collections of scripts. Free time for studying and practicing scripts.
4	Teletu- torial	Collect video-cassette tape worksheet No. 4. "Still Photography." Demonstrate using still cameras. Administer second test battery.	4	Lecture	Lecture on Lesson No. 4. "Still Photography." Demonstrate using still cameras. Administer second test batteries.

Table 6. (Continued)

Group 1			Group 2		
Week	Method	Class Management	Week	Method	Class Management
5	Orien- tation (Not includ- ed in the study)	Orientation on lecture method. Equipment practicum in I. R. C.	5	Orien- tation (Not includ- ed in the study)	Orientation on teletutorial method. Demonstrating how to use video-cassette equipment by showing one of the video-cassette tapes. Equipment practicum in I. R. C.
6	Lecture	Lecture on Lesson No. 5. "Motion Photography and Video Taping." Demonstrating on using video portable equipment and super 8mm cameras. Provide time for practice.	6	Teletu- torial	Collect video-cassette tape worksheet No. 5. "Motion Photography and Video Tap- ing." Demonstrating us- ing video portable equip- ment and super 8mm cameras. Provide time for practice.
7	Lecture	Lecture on Lesson No. 6. "Audio Taping." Demonstrate using of audio tape equipment. Provide time for lab practice.	7	Teletu- torial	Collect video-cassette tape worksheet No. 6. "Audio Taping." Demonstrate using of audio tape equipment. Provide time for lab practice.
8	Lecture	Lecture on Lesson No. 7. "Overhead Transparencies." Demonstrate making transparencies. Administer third test battery.	8	Teletu- torial	Collect video-cassette tape worksheet No. 7. "Over- head Transparencies." Administer third test batteries.

Table 6. (Continued)

Group 1			Group 2		
Week	Method	Class Management	Week	Method	Class Management
9	(Not included in the study)	Student's final presentations	9	(Not included in the study)	Student's final presentations.
10	(Not included in the study)	Student's final presentations.	10	(Not included in the study)	Student's final presentations.

Class Management

Teletutorial tapes

A viewing area in the I. R. C. as well as the University Library were equipped with a video-cassette playback machine and a color monitor. The worksheets were distributed during previous classes. Each student in the teletutorial group was able to view the tape any hour during the day in either of the above mentioned places when they had free time. Since these video-cassettes were planned and produced with the idea that a student could learn at his own pace, a system of having one student review the tape at a time was encouraged. However, because some students had preferences for viewing the tape at certain times and because of the limited amount of equipment, a maximum of two students was allowed to view the tape at the same time.

A student could go at any time to check out the tape corresponding to the lesson he was to master if no other student was using it. Prior to the teletutorial method, the group was exposed to an orientation in which instruction was given on manipulating and operating the playback. The student could master the topic by following the directions and instructions given by the tape, which were correlated with the textbook. The worksheet was to be answered during the viewing time and handed in during the next class meeting.

Lecture

While the teletutorial group viewed a video-cassette tape each week, the lecture group received instruction by the traditional lecture method. Efforts were made to insure that the two groups were treated as nearly alike as

possible in content with differences only in the instructional method. For example, each instructor carefully followed the teletutorial scripts in teaching the lecture groups in order to secure the same specified length of time between the lecture and teletutorial tape. Attention was also paid to the fact that the lecture group was taught with the same media as the teletutorial group. The media included super 8mm films, slides, transparencies, flip charts, display materials, and audiotapes.

There were no worksheets to be prepared by the lecture group. However, the essay questions used on the teletutorial worksheet were brought up in the lecture and discussion sessions instead of having the questions answered on an individual basis.

The textbook, Media for Teachers, (Volker, Henre, Balzer, Braught, Cairns, Rumme, Simonson, Tien, and Wilson, 1972) was used by both the teletutorial and the lecture groups. The book contains theory and practice with clearly identifiable skills stated as behavioral objectives. The content of the book was correlated with the topics of the course and the students in both groups were assigned to read the appropriate chapters prior to each topic. An example of the teletutorial script is in Appendix B.

Classroom demonstration

Classroom demonstration was a part of two-hour regularly scheduled class period for both the teletutorial and the lecture groups. Equipment needed for each topic was set up in the classroom and instruction was given on ways of using equipment and on production techniques. For example, on the topic of "Displays and Handouts," the demonstration included the techniques of using the dry mount press in producing three types of display

materials, and using the ditto machine in duplicating multicolor handouts. In "Still Photography," the demonstration was mainly how to use various types of still cameras.

Laboratory work

After the classroom demonstration, the students were able to come to the I. R. C. and use the rest of the period to produce their media assignment (see Appendix C). Students who did not finish the assignment within the scheduled class period were permitted to use their free time to do so.

Measuring Instruments

The measuring instruments administered in this study consisted of three test batteries. The first test battery consisted of:

1. Student Opinion Survey 1 (Rotter Scale, Appendix D)
2. Media Background Inventory (Appendix G)
3. Art Background Inventory (Appendix G)
4. Preference for Learning Inventory 1 (Appendix E).

The purpose of these tests was to measure the students' initial abilities prior to the treatment. Student GPA, which was used as one of the learner variables, was also collected. The second test battery consisted of:

1. Neidt Attitude Scale Form A (Appendix E)
2. Diligence Scale 1 (Appendix G)
3. Achievement Test 1 (Appendix F).

The third test battery consisted of:

1. Neidt Attitude Scale Form B (Appendix E)
2. Student Opinion Survey 2 (Rotter Scale, Appendix D)

3. Preference for Learning Inventory 2 (Appendix E)
4. Diligence Scale 2 (Appendix G)
5. Achievement Test 2 (Appendix F).

The Neidt Attitude Scale Form B and Form A were parallel forms. The Student Opinion Survey, Preference for Learning Inventory and the Diligence Scale were the same devices as used in the first and second test batteries.

Personality scale

Since "personality" encompasses a broad area and the scale used in this study was to provide information as to how students perceive selected events or conditions, it was entitled Student Opinion Survey.

The Student Opinion Survey was based on Rotter's (1966) Internal-External Locus of Control Scale, the I-E. (Appendix D). There were twenty-nine items, with a pair of statements in each item. It was machine scored and the score was the number of items marked External direction. The difference between external and internal personalities on the Rotter Scale is that the first subject believes his behavior leads to no specific consequences and the latter believes his actions influence consequences.

Attitude scales

The Neidt Attitude Scale was the main attitude scale used. The Preference for Learning Inventory was constructed to determine the students' attitude changes toward different instructional methods used in the study.

The Neidt Attitude Scale Form A was given at the completion of the first

instructional treatment. This scale consisted of items measuring attitudes toward expectation, content, and learning method. The parallel Form B was given again at the termination of the quarter. The Neidt Attitude Scale contained twenty-six items in Likert format. Some items were weighed positively while some were weighed negatively. Students responded on a 1-5 IBM answer sheet according to the test instruction. Results were machine scored. There were five items included on measuring expectation, five on content, and sixteen on method.

The items measuring attitude toward expectation included such items as "I am disappointed with this class" or "I did not think I would learn as much in this class as I have." These items were measuring students' general feelings toward the course.

The items measuring attitude toward content included such items as "Too much emphasis has been placed on topics that are unimportant," or "The subject matter of this class is interesting." These items were measuring students' attitudes toward the subject matter.

The items measuring attitude toward method included such items as "I am satisfied with the methods used in teaching this class," or "There is not enough contact between teacher and students in this class." These items were measuring students' attitudes toward the teaching method used in Education 305B.

The Preference for Learning Inventory was a two-item Likert-format rating scale. The student was asked to rate, on a scale from 1 to 5, his preference for the lecture method of television instruction and other individual approaches. In this inventory, the first item was related to his general preference for learning in courses and the second item concentrated on Education 305B

course only. There were two administrations of this inventory, prior to and at the end of the course. (Neidt Attitude Scale Form A, Form B, and Preference for Learning Inventory are in Appendix E).

Achievement tests

Two achievement tests with fifteen multiple choice items in each were constructed for this study. In the first achievement test, the items sampled the content and skills covered in the first three main topics (Displays and Handouts, Behavioral Objectives, and Scripting, and Still Photography). It was given at the end of the fourth week when the students were completing the first instructional method.

The second achievement test covered the remaining three topics (Motion Photography, Audio Taping, and Overhead Transparencies) and was given immediately at the completion of the second instructional method. In the construction of these tests the outcomes of the course were defined in behavioral terms and the test plans were constructed (see Brown, 1970) to secure the content validity. Copies of the achievement tests are in Appendix F.

Other inventories

The Media Background Inventory was a questionnaire in which students were asked if they had taken any college courses taught by television and/or individualized instruction. They also were asked to mark the degrees of familiarity in using various media equipment as well as checking the items of media materials that they had produced before.

The Art Background Inventory was a questionnaire asking students to choose from several statements the one that best described their ability

as well as attitude in art.

The Diligence Scale was a one item questionnaire asking students how many hours they devoted to the work assigned. (These inventories are in Appendix G).

Method of Statistical Analysis

The primary method of analysis used for comparing variables was the t-test. Comparisons were made between the two groups on the differences in achievement, attitudes, and preference for learning. Paired t-tests were also employed to detect the changes in the students' personality, diligence, and attitude responses. Hypotheses were tested at the 0.05 level of significance.

Stepwise multiple regression procedures were used to determine the importance of each learner variable in predicting achievement test and attitude scale scores.

Hypotheses Tested

Comparisons were made between two different instructional methods and tests were conducted for the existence of differences in the following hypotheses:

1. There is no significant difference in achievement between students taught by teletutorial and those taught by conventional lecture methods as measured by an achievement test using 305B test items.
2. There is no significant difference in preferences for learning method between students who are taught by a teletutorial method followed by a conventional lecture method and students who are first taught by lecture and then by a teletutorial method as

measured by the Preference for Learning Inventory.

3. There is no significant difference in attitudes (as measured by the Neidt Attitude Scale) between students taught by lecture and those taught by teletutorial methods.

In addition, multiple regression analyses were run to determine which learner variables best predicted achievement and attitudes under the two instructional conditions.

Basic Assumptions

The following assumptions were made in this study:

1. Students who were assigned to different sections through University computerized system of scheduling classes would be randomly distributed to both groups in the study, i.e., their scores would be comparable on GPA, Art Background, Inventory Media Background Inventory, Preference for Learning Inventory, and the Student Opinion Survey (Rotter Scale).
2. The teacher variables were equivalent between groups. Each teacher taught the same number of sections of each group, followed a prescribed course outline and used the same test materials.
3. Any differences between the groups were due to the effects of instructional methods and/or learner variables.
4. The quality of the teletutorial tapes No. 2, No. 3, and No. 4 were equivalent to the quality of the teletutorial tapes No. 5, No. 6, and No. 7.

Delimitations of the Study

The scope of this study was limited to the Education 305B students in Iowa State University, Ames, Iowa, during Winter Quarter, 1974. The students used in the study were enrolled in ten sections of the Education 305B classes. All of the students enrolled in these classes were in the Teacher Education Program.

There were four instructors involved in this study. Some of the uncontrolled teacher variables such as the difference between teachers' attitudes, personalities, and teaching experiences were expected. An effort was made to moderate these factors by providing the teachers with a detailed course outline to follow on each topic. Also, each instructor taught an equal number of sections in each group.

A total of fifteen subjects was lost before the completion of the study. They either dropped the course or were absent during the data collection. There was no systematic bias found in the type of students who dropped from the course. Some of the students were aware that they were participating in the study and a certain amount of Hawthorne effect probably resulted from that awareness.

Every attempt was made to minimize variation between the two groups. For example, the behavioral objectives for both groups were the same, the audiovisual aids used were identical, and the length of time involved was similar. However, as Borg and Gall (1963), mention complete control of the extraneous variables is difficult or impossible.

FINDINGS

The findings of this study are based on the data obtained by testing 159 students in Iowa State University Education 305B classes and the responses to Personality Survey, Attitudes Scale, Preference for Learning Inventory and Media Background Inventory that were administered during the eight-week period of the study.

In the findings related to this study, six categories are included:

1. Test of initial differences
2. Test of hypothesis 1
3. Test of hypothesis 2
4. Test of hypothesis 3
5. Multiple regression analysis
- and 6. Summary of findings.

Test of Initial Differences

Numerous t-tests were performed to compare the scores of the two groups on the learner variables (GPA, Student Opinion Survey, Media Background Inventory, Art Background Inventory, and Preference for Learning Inventory, see Table 7).

The non-significant results of these t-tests indicate that the students in the two groups did not initially differ in the learner variables examined; thus it is assumed that the randomization method was adequate.

Table 7. Summary of t-tests on learning variables for initial differences

Learner Variable-Measures	Group	N	Mean	Standard deviation	t-tests between groups	Two-tail probability ^a
GPA	1	79	2.87	0.53	0.52	0.60
	2	80	2.83	0.48		
Student Opinion Survey (Rotter 1)	1	79	9.27	4.18	-0.82	0.41
	2	80	9.81	4.20		
Media Background Inventory:						
Previous TV course experience	1	79	1.70	0.52	-1.91	0.06
	2	80	1.83	0.43		
Previous individualized instruction course experience	1	79	1.71	0.46	-0.40	0.69
	2	80	1.74	0.44		
Equipment familiarity	1	79	21.97	5.00	0.72	0.48
	2	80	21.43	4.66		
Materials familiarity	1	79	1.89	1.61	0.29	0.78
	2	80	1.81	1.62		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 7. (continued)

Learner Variable-Measures	Group	N	Mean	Standard deviation	t-tests between groups	Two-tail probability ^a
Art Background Inventory:						
Art ability	1	79	1.85	0.80	-0.01	0.99
	2	80	1.85	0.89		
Art attitude	1	79	2.30	0.72	1.05	0.30
	2	80	2.19	0.68		
Preference for Learning Inventory 1:						
Preference for learning in general 1	1	79	2.47	0.86	0.52	0.60
	2	80	2.40	0.79		
Preference for learning in Education 305B 1	1	79	2.77	0.85	-0.13	0.90
	2	80	2.79	0.69		

Test of Hypothesis 1

The first hypothesis tested was that there was no significant difference in the achievement between students taught by teletutorial and those taught by a conventional lecture method.

A t-test was used to compare the results on Achievement Test 1 after the first phase of treatment. In this way, achievement as a consequence of teletutorial instruction was compared to achievement as a consequence of lecture instruction. The t-test failed to reveal significance at the 0.05 level (see Table 8).

A t-test was employed to compare groups 1 and 2 on Achievement Test 2 after the second phase of treatment, that is, after the instructional methods were shifted between the two groups. No significant difference was detected in the achievement of the two groups (see Table 8).

Test of Hypothesis 2

The second hypothesis tested was that there was no significant differences in preference for learning method between students who are taught by teletutorial followed by conventional lecture method and students who are first taught by lecture and then by a teletutorial method. As the two groups were found to be statistically equivalent on both measures of preference (Preference in general and Preference in 305B) before the course began, (see Table 7), differences in preferences at the end of instruction were used to test this hypothesis.

A t-test on each measure of preference (Preference for learning in general and in Education 305B) was used. Neither was significant (see Table 9). These results indicate that a significant difference in preference did not occur as a result of teaching method sequence.

Test of Hypothesis 3

The third hypothesis tested was that there was no significant difference in attitudes between students taught by lecture and those taught by a teletutorial method. Attitudes were defined as scores on the three scales (method, content, and expectation) of the Neidt Attitude Scale.

Because the two groups had not been exposed to the course content of Education 305B the Neidt Attitude Scale was inappropriate as a pre-instructional measure since its purpose is to determine attitude toward course content. The randomization of the groups, however, favored the assumption that the groups did not differ significantly in their attitudes toward instruction prior to the treatment.

The data were collected at the end of both the first and the second phases of the treatment. The two groups were compared by means of t-tests on each of the three scales. None was significant on the first attitude scale. However, a significant difference was shown on attitude toward expectation at the end of the second phase of treatment at the 0.01 level (see Table 10).

Paired t-tests were employed to determine the change on Student Opinion Survey (Rotter Scale), Diligence Scale, Neidt Attitude Scale (Forms A and B) and Preference for Learning Inventory between the first and the second administrations of the scales (see Table 11a, 11b, 11c, and 11d).

Table 8. Summary of t-tests on differences in Achievement Test 1 and 2

	Group	N	Mean	Standard deviation	t-tests between groups	Two-tail probability ^a
Achievement Test 1	1	79	9.00	2.00	0.79	0.43
	2	80	8.75	2.00		
Achievement Test 2	1	79	8.05	2.16	-0.40	0.69
	2	80	8.20	2.56		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 9. Summary of t-tests on differences in Preference for learning in general and in Education 305B

	Group	N	Mean	Standard deviation	t-tests between groups	Two-tail probability ^a
Preference for learning in general 2	1	79	2.35	0.92	-1.49	0.14
	2	80	2.58	0.95		
Preference for learning in Education 305B 2	1	79	2.83	1.17	-0.28	0.78
	2	80	2.81	1.15		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 10. Summary of t-tests on Attitude Scale

	Group	N	Mean	Standard deviation	t-tests between groups	Two-tail probability ^a
Attitude Scale 1 (Neidt Attitude Scale Form A):						
Attitude toward method 1	1	79	53.24	8.11	-0.85	0.40
	2	80	54.26	7.08		
Attitude toward content 1	1	79	16.04	3.47	-1.21	0.23
	2	80	16.70	3.41		
Attitude toward expectation 1	1	79	17.15	2.52	0.14	0.89
	2	80	17.09	3.16		
Attitude Scale 2 (Neidt Attitude Scale Form B):						
Attitude toward method 2	1	79	53.16	7.60	1.01	0.31
	2	80	51.96	7.41		
Attitude toward content 2	1	79	16.75	3.51	0.67	0.50
	2	80	16.34	4.21		
Attitude toward expectation 2	1	79	16.65	2.30	3.42	0.01
	2	80	15.26	2.77		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 11a. Summary of t-tests on test-retest measures of Personality

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Student Opinion Survey (Personality):					
Student Opinion Survey 1 (Rotter 1)		9.54	4.19		
vs	159			-2.04	0.04
Student Opinion Survey 2 (Rotter 2) (combined groups)		10.08	4.65		
Student Opinion Survey 1 (Rotter 1)		9.27	4.18		
vs	79			-0.91	0.37
Student Opinion Survey 2 (Rotter 2) (group 1)		9.62	5.02		
Student Opinion Survey 1 (Rotter 1)		9.81			
vs	80			-2.01	0.05
Student Opinion Survey 2 (Rotter 2) (group 2)		10.54			

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 11b. Summary of t-tests on test-retest measures of Diligence Scale

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Diligence Scale:					
Diligence Scale 1		4.02	1.05		
vs	159			5.47	0.01
Diligence Scale 2 (combined groups)		3.47	0.98		
Diligence Scale 1		4.10	0.98		
vs	79			5.84	0.01
Diligence Scale 2 (group 1)		3.32	1.01		
Diligence Scale 1		3.94	1.11		
vs	80			2.20	0.03
Diligence Scale 2 (group 2)		3.61	0.93		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 11c. Summary of t-tests on test-retest measures of Attitude Scale

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Neidt Attitude Scale:					
Attitude toward					
method 1		53.75	7.60		
vs	159			1.88	0.06
method 2 (combined groups)		52.56	7.51		
Attitude toward					
method 1		53.24	8.11		
vs	79			0.08	0.94
method 2 (group 1)		53.16	7.60		
Attitude toward					
method 1		54.26	7.08		
vs	80			2.77	0.01
method 2 (group 2)		51.96	7.41		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 11c. (continued)

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability
Attitude toward content 1		16.37	3.45	-0.57	0.57
vs content 2 (combined groups)	159			-0.57	0.57
Attitude toward content 1		16.04	3.47		
vs content 2 (group 1)	79			-1.78	0.08
Attitude toward content 1		16.70	3.41		
vs content 2 (group 2)	80			0.84	0.41

Table 11c. (continued)

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Attitude toward expectation 1		17.12	2.85		
vs expectation 2 (combined groups)	159	15.95	2.64	4.39	0.01
Attitude toward expectation 1		17.15	2.52		
vs expectation 2 (group 1)	79	16.65	2.30	1.69	0.10
Attitude toward expectation 1		17.09	3.16		
vs expectation 2 (group 2)	80	15.26	2.77	4.26	0.01

Table 11d. Summary of t-tests on test-retest measures of Preference for Learning

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Preference for learning in general and in Education 305B:					
Preference for learning in general 1		2.43	0.82		
vs	159			-0.36	0.72
Preference for learning in general 2 (combined groups)		2.47	0.94		
Preference for learning in general 1		2.47	0.86		
vs	79			0.93	0.35
Preference for learning in general 2 (group 1)		2.35	0.92		

^aSince many tests were run using the same data, the actual two-tail probabilities are larger than those listed.

Table 11d. (continued)

Variable	N	Standard Mean deviation	t-tests between first and second administration	Two-tail probability ^a
Preference for learning in general 1		2.40 0.79		
vs	80		-1.42	0.16 (NS)
Preference for learning in general 2 (group 2)		2.58 0.95		
Preference for learning in Education 305B1		2.78 0.77		
vs	159		-0.76	0.45 (NS)
Preference for learning in Education 305B2 (combined groups)		2.86 0.16		

Table 11d. (continued)

Variable	N	Mean	Standard deviation	t-tests between first and second administration	Two-tail probability ^a
Preference for learning in Education 305B1		2.77	0.85		
vs	79			-0.38	0.70(NS)
Preference for learning in Education 305B2 (group 1)		2.84	1.17		
Preference for learning in Education 305B1		2.79	0.69		
vs	80			-0.72	0.47(NS)
Preference for learning in Education 305B2 (group 2)		2.89	1.45		

From Tables 11a, 11b, 11c three significant differences in scores were detected.

Student Opinion Survey 1 vs 2 (Rotter Scale): The t-test was significant at the 0.05 level across groups; however, when the groups are considered separately, it can be seen that on the Student Opinion Survey 1 (Rotter 1) group 1 showed no significant difference, whereas group 2 showed a difference at the 0.05 level.

Diligence Scale 1 vs 2: The highly significant t-value indicates that there was a decrease in the time that students spent studying Education 305B, comparing the first phase of the study and the second. This difference is 5.84 for group 1 at the 0.01 level and 2.20 for group 2 at the 0.05 level.

Neidt Attitude Scale Form A vs B: Among the three scales of the Neidt Attitude Scales, only Attitude toward expectation shows a significant difference; this held only for group 2. A closer look at the data indicates that scores on the Attitude toward expectation scale dropped between the completion of the first and the second phases of instruction.

Multiple Regression Analysis

Stepwise regression analyses were computed to determine which of the several learner variables best predicted achievement and attitudes. Tables 12, 13, 14, and 15 report the proportion of variance accounted for by each learner variable on dependent variables (achievements). A separate analysis was done for each group for each phase of the experiment.

The learner variables are listed in order of importance. Table 12 shows that GPA (contributing 9% of the variance) was the best predictor of Achievement 1 for group 1, followed by Rotter 1 and Preference for learning in Education 305B. Learner variables listed below Materials

Table 12. Learner variables that predict Achievement 1 for group 1

Variable	R	R ²
GPA	0.30	0.09
Student Opinion Survey 1 (Rotter 1)	0.39	0.15
Preference for learning in Education 305B1	0.46	0.21
Art attitude	0.47	0.22
Preference for learning in general	0.48	0.23
Art ability	0.48	0.23
Materials familiarity	0.49	0.24

familiarity are contributing less than 1% of the variance and are not considered valuable. The total variance accounted for is 24%. The leading variable in predicting Achievement 1 for group 2 was also GPA (contributing 3% of the variance). (See Table 13). However, every learner variable is contributing a very small proportion of the variance accounted for. (The total variance accounted for is 9%).

To predict Achievement 2 for group 1, the most important learner variables were Equipment familiarity, Student Opinion Survey 1, followed by Student Opinion Survey 2. In Table 14 the total variance accounted for is 23%.

To predict Achievement 2 for group 2, Materials familiarity played the most important role among all the learner variables (contributing 10% of the variance) followed by previous individualized instruction course experience (contributing additional 5% of the variance), and Preference for

method in general 2 (contributing additional 4% of the variance). The total variance accounted for is 40%. (See Table 15).

Table 13. Learner variables that predict Achievement 1 for group 2

Variable	R	R ²
GPA	0.19	0.03
Previous individualized instruction course experience	0.24	0.06
Preference for learning in Education 305B1	0.26	0.07
Equipment familiarity	0.28	0.08
Preference for learning in general	0.29	0.08
Student Opinion Survey (Rotter 1)	0.30	0.09

Table 14. Learner variables that predict Achievement 2 for group 1

Variable	R	R ²
Equipment familiarity	0.23	0.06
Student Opinion Survey (Rotter 1)	0.28	0.08
Student Opinion Survey (Rotter 2)	0.36	0.13
Attitude toward expectation 1	0.39	0.15
GPA	0.41	0.17
Preference for learning method in general 2	0.43	0.19
Attitude toward method 1	0.46	0.21
Art attitude	0.47	0.22
Previous individualized instruction course experience	0.48	0.23

Table 15. Learner variables that predict Achievement 2 for group 2

Variable	R	R ²
Materials familiarity	0.32	0.10
Previous individualized instruction course experience	0.38	0.15
Preference for learning method in general 2	0.44	0.19
Art attitude	0.47	0.22
Attitude toward expectation 1	0.50	0.25
Equipment familiarity	0.52	0.27
Attitude toward content 1	0.55	0.30
Diligence Scale 2	0.57	0.33
Student Opinion Survey (Rotter 2)	0.58	0.34
Student Opinion Survey (Rotter 1)	0.61	0.38
Preference for learning method in Education 305B2	0.63	0.39
GPA	0.63	0.40

Tables 16, 17, 18, and 19 report the proportion of the variance accounted for by the learner variables on Attitudes. A separate analysis was done for each group and for each phase of the experiment. For group 1, in predicting Attitude toward method 1 Materials familiarity was the leading variable (contributing 4% of the variance), and then Previous TV course experience (contributing additional 3% of the variance); in predicting Attitude toward content 1 the most important variable was also Materials familiarity (contributing 9% of the variance) and followed by Previous individualized instruction course experience (contributing

Table 16. Learner variables that predict Attitudes 1 for group 1

Variable	R	R ²
<u>Attitude toward method 1:</u>		
Materials familiarity	0.20	0.04
Previous TV course experience	0.26	0.07
Equipment familiarity	0.30	0.09
Art attitude	0.33	0.11
Preference for learning in Education 305B1	0.36	0.13
Student Opinion Survey (Rotter 1)	0.38	0.15
Preference for learning in general 1	0.40	0.16
Previous individualized instruction course experience	0.41	0.17
<u>Attitude toward content 1:</u>		
Materials familiarity	0.30	0.09
Previous individualized instruction course experience	0.34	0.12
Art attitude	0.35	0.12
Student Opinion Survey 1 (Rotter 1)	0.36	0.13
<u>Attitude toward expectation 1:</u>		
Equipment familiarity	0.20	0.04
Art attitude	0.28	0.08
Previous TV course experience	0.31	0.09
Previous individualized instruction course experience	0.32	0.10
GPA	0.33	0.11

Table 17. Learner variables that predict Attitudes 1 for group 2

Variables	R	R ²
<u>Attitude toward method 1:</u>		
GPA	0.22	0.05
Art attitude	0.26	0.07
Equipment familiarity	0.30	0.09
Student Opinion Survey 1 (Rotter 1)	0.31	0.10
Preference for learning in Education 305B1	0.32	0.10
Preference for learning in general 1	0.34	0.11
Previous TV course experience	0.34	0.12
<u>Attitude toward content 1:</u>		
Student Opinion Survey 1 (Rotter 1)	0.20	0.04
GPA	0.29	0.08
Art ability	0.32	0.10
Art attitude	0.33	0.11
Equipment familiarity	0.34	0.12
Preference for learning in general 1	0.36	0.13
<u>Attitude toward expectation 1:</u>		
Art attitude	0.33	0.11
Student Opinion Survey 1 (Rotter 1)	0.38	0.15
Previous TV course experience	0.41	0.17
Previous individualized instruction course experience	0.43	0.19
Preference for learning in general 1	0.44	0.20

Table 17. (continued)

Variable	R	R ²
Materials familiarity	0.46	0.21
Equipment familiarity	0.47	0.22
Preference for learning in Education 305B1	0.48	0.23
GPA	0.49	0.24

additional 3% of the variance); and in predicting Attitude toward expectation 1, Equipment familiarity (contributing 4%) and Art attitudes (contributing additional 4% of the variance) seemed to be more meaningful. The total variation to explain method, content, and expectation by these variables were 17%, 13%, and 11% respectively. (See Table 16).

For group 2, in predicting Attitude toward method 1, GPA (contributing 5% of the variance), was the leading variable. To predict Attitude toward Content 1, Student Opinion Survey (contributing 4% of the variance), contributed most. And in predicting Attitude toward expectation 1, Art attitude was more meaningful. (Contributing 11% of the variance). The total variance accounted for method, content and expectation were 12%, 13%, and 20% respectively. (See Table 17).

To predict Attitude toward method 2 for group 1, the learner variable that contributes the most was Materials familiarity (contributing 6% of the variance, and Art attitude (contributing additional 3% of the variance). The total variance accounted for was 18%. To predict Attitude toward content 2 for group 1, the most important variable was Materials

Table 18. Learner variables that predict Attitudes 2 for group 1

Variable	R	R ²
<u>Attitude toward method 2:</u>		
Materials familiarity	0.25	0.06
Art attitude	0.30	0.09
Equipment familiarity	0.34	0.12
Preference for learning in Education 305B2	0.38	0.14
Previous individualized instruction course experience	0.40	0.16
Student Opinion Survey 1 (Rotter 1)	0.41	0.17
Previous TV course experience	0.42	0.18
<u>Attitude toward content 2:</u>		
Materials familiarity	0.31	0.10
Equipment familiarity	0.38	0.14
Diligence Scale 1	0.41	0.17
Preference for learning in Education 305B2	0.43	0.19
Preference for learning in Education 305B1	0.45	0.20
Art attitude	0.46	0.21
Previous individualized instruction course experience	0.47	0.22
<u>Attitude toward expectation 2:</u>		
Preference for learning in Education 305B2	0.30	0.09
Materials familiarity	0.36	0.13
Equipment familiarity	0.44	0.20
GPA	0.46	0.21

Table 18. (continued)

Variable	R	R ²
Student Opinion Survey 1 (Rotter 1)	0.48	0.23
Art ability	0.50	0.25
Art attitude	0.51	0.26

familiarity (contributing 10% of the variance), and next Equipment familiarity (contributing additional 4% of the variance). The total variance accounted for was 22%. To predict Attitude toward expectation 2 for group 1, Preference for learning in Education 305B2 was the leading variable (contributing 9% of the variance) and the second important variable listed was Materials familiarity (contributing additional 4%). The total variance was 26%, (See Table 18).

Table 19. Learner variables that predict Attitudes 2 for group 2

Variable	R	R ²
<u>Attitude toward method 2:</u>		
Student Opinion Survey 1 (Rotter 1)	0.23	0.05
Materials familiarity	0.28	0.08
Preference for learning in general 2	0.31	0.10
Achievement 1	0.33	0.11
Preference for learning in general 1	0.34	0.11
Previous TV course experience	0.35	0.12

Table 19. (continued)

Variable	R	R ²
Art ability	0.36	0.13
<u>Attitude toward content 2:</u>		
Preference for learning in Education 305B2	0.20	0.04
Art ability	0.26	0.07
Preference for learning in Education 305B1	0.29	0.09
Student Opinion Survey 1 (Rotter 1)	0.34	0.12
Achievement 1	0.37	0.14
Materials familiarity	0.39	0.16
Previous TV course experience	0.41	0.17
<u>Attitude toward expectation 2:</u>		
Preference for learning in general 2	0.32	0.10
Diligence Scale 2	0.37	0.13
Previous TV course experience	0.41	0.17
Art attitude	0.44	0.20
Art ability	0.48	0.23
Diligence Scale 1	0.50	0.25
Previous individualized instruction course experience	0.51	0.26
Materials familiarity	0.52	0.27

In predicting Attitude toward method 2 for group 2, the Student Opinion Survey was the most important variable (contributing 5% of the variance, and the second most important variable was Materials familiarity

(contributing additional 3% of the variance), the total variance accounted for was 12%; in predicting Attitude toward content 2, Preference for learning in Education 305B2 (contributing 4% of the variance) and Art ability (contributing additional 3% of the variance) were better predictors. The total variance accounted for was 17%; and in predicting Attitude toward expectation 2, Preference for learning method in general 2 (contributing 10% of the variance) and Diligence Scale 2 (contributing additional 3% of the variance) were the variables accounting for the largest proportion of the variance accounted for. The total variance was 27%. (See Table 19).

In order to discover the relationships between all the learner variables investigated, Pearson product correlation coefficients were computed, and Appendix H lists the results of those variables that were significantly correlated. As may be seen in Appendix H, many of the learner variables were highly correlated; this may account for the relatively small contributions of the variables in the regression.

Summary

On the basis of the findings in this study, the following conclusions were drawn:

1. Teletutorial instructional method and conventional lecture method did not result in any significant difference in student achievement.
2. Student preferences for learning both in general and in Education 305B did not differ as a result of the exposure to two different instructional conditions: teletutorial method followed

by lecture method, and lecture method followed by teletutorial method.

3. Student expectations for the teletutorial treatment were not fulfilled when they were exposed to the lecture method first and probably entertained greater expectation for the teletutorial method.
4. Student personality measures showed a significant difference at the 0.05 level on the test-retest across groups. Only students taught by lecture first followed by the teletutorial method became more externally-oriented.
5. Student achievement in both lecture and teletutorial groups cannot be significantly predicted. However, from the results of regression analyses, GPA was slightly predictive for Achievement 1 and Media Background scores seemed to be a better predictor for Achievement 2.
6. Student attitudes in both lecture and teletutorial groups cannot be significantly predicted. From the findings of regression analyses, GPA seemed to be the best predictor for the lecture group, and Media Background scores for the teletutorial group. No predictive pattern was detected after the second phase of the treatment; that is, after the students were exposed to both of the instructional methods.

DISCUSSION

The purpose of this study was to answer six questions and test three hypotheses. The first question asked whether there were any initial differences among students in regard to Media Background Inventory, Art Background Inventory, GPA, Student Opinion Survey (Rotter Scale) and Preference for Learning Method. The results indicate that no initial differences were found by t-tests. Thus, an adequate randomization procedure was achieved. In random assignment, some degree of difference was expected to occur between the two groups. For example, one group may contain students that have higher GPA, more media background, or were different in other ways from the students in another group. However, the t-tests results showed no significant differences between groups.

The second question asked whether there is a difference in achievement between the students taught by a teletutorial method and those taught by the lecture method. On the basis of the findings in this study, difference in achievement was not detected; when the classroom demonstration and laboratory work are still taught the conventional way, achievement is equal in using both the teletutorial method and the conventional lecture method.

The third question is: Does the student's preference for learning differ as a result of the exposure to two different instructional conditions? The findings indicate that no significant difference in preference did occur. Thus, if a group is taught by teletutorial first and

then followed by lecture, or vice versa, there would be no influence in student preference for learning method.

The fourth question was formulated to detect the difference in attitudes (method, content, and expectation) of the students in the two groups that received two different instructional methods. A significant difference was shown on the expectation scale (phase 2). The reason might be that students, who received the lecture method first were disappointed by the extra work of viewing tapes and became dissatisfied with the teletutorial method.

Many explanations may be proposed to account for the test-retest results. For example, student personalities show a significant difference in test-retest. Brown (1970, p. 422) suggests "... scores on personality measures are generally less stable than scores on measures of maximal performance." And it may explain the significant difference of the t-tests between the first and the second administration of the Student Opinion Survey (Rotter).

The significant t-value indicates that the student diligence scores dropped from the first to the second phase of the experiment. It is interesting to note that achievement, measured at the end of each phase of the course, also dropped, although this is not significant for group 2. This may, of course, be due to actual differences in difficulty level of the two achievement tests.

From the test-retest results for the three scales of Attitudes, only Attitude toward expectation in group 2 shows a significant difference. The data indicate the scores on Attitude toward expectation dropped and the

explanation could be that the fulfillment of expectations for the lecture method (Phase 1) may be obfuscated by anticipation of the teletutorial method (Phase 2). Perhaps the lack of change in group 1 is due to a general decrease in expectation resulting from dissatisfaction with the teletutorial method and this feeling extended into Phase 2. A second reason may be that toward the end of the quarter, pressure tends to build in any course, students in group 2 may have felt some lack of individual attention in the teletutorial instruction.

The fifth question asked what are the learner variables that influence achievement in each group under selected instructional conditions?

To predict Achievement 1 for both group 1 and group 2, the leading variable is GPA. However, the amounts of the total variances revealed by the multiple regression in both groups are rather small (24% for group 1 and 9% for group 2). It is concluded that there is more reliability in predicting student achievement in group 1 than in group 2 although this reliability is very low. Next to GPA, it seems that in group 1, the other predictors are Student Opinion Survey (Rotter 1), and then preference for learning method in Education 305B; and, in group 2, previous individualized instruction course experience and preference for learning method in Education 305B.

To predict Achievement 2 for group 1, Equipment familiarity (contributing 5%) is the best predictor and then Student Opinion Survey (Rotter 2). The total variance accounted for is 23%. To predict Achievement 2 for group 2, Materials familiarity (contributing 10%) and previous individualized instruction course experience are most important, and the

total variance is 40%. From the results, we can conclude that there might be a possibility that since the Achievement 2 test placed a little more emphasis on utilization of equipment and production of materials, and since the final presentation did require students to do certain production work, students are involved more with equipment and materials which are definitely related in usage and theory. To compare the total variances accounted for in both groups, the group that had just received the teletutorial method (group 2) is again easier to predict when compared with those who had just received lecture method (group 1).

The sixth question asks: What learner variables influence attitudes under selected instructional conditions?

To predict attitudes toward method, content, and expectation for group 1 (those received teletutorial method) it seems that media background plays an important role compared to other learner variables. The second important variable seems to be Art attitude. This trend can be seen from the stepwise regression results in the three scales. Although the total proportions of the variance accounted for in method, content, and expectation are all quite small (17%, 13%, and 11% respectively), the results are of value in terms of reporting that Media Background and Art attitude have a most important role in predicting attitudes of students in teletutorial instruction.

For group 2 (those receiving the conventional lecture method), the findings show that GPA is an important factor in predicting method as well as content. The Student Opinion Survey 1 (Rotter 1) is also a factor of equivalent importance for predicting content. This may be explained by

the fact that a student's personality might influence his like or dislike of different types of content in a conventional lecture class. Art background is also a leading variable in predicting both method and content, probably because in many of the media courses, certain artistic considerations involved and students with better Art background usually feel more rewarded, which may be helpful in developing a positive attitude.

To predict Attitude toward expectation 1, for group 2, the best predictors are Art attitude and Student Opinion Survey 1 (Rotter 1), and the total variance accounted for is 20%, which is larger than that of predicting attitude for teletutorial groups. The possible reason is that when students enter a new teletutorial condition they usually are not sure what to expect.

To predict Attitudes 2 for group 1 (those taught by teletutorial and then lecture method), Media Background, Preference for learning in Education 305B are the common learner variables in predicting all of the three scales.

To predict Attitudes 2 for group 2 (those taught by lecture and then followed by teletutorial method) the variable that seems rather important and found in all three scales are Preference for learning in general 2 (and in Education 305B). And Student Opinion Survey (Rotter 1) is the leading variable in predicting attitude toward method 2 after the second phase of the treatment. It is interesting to observe that GPA is not contributing much to the variance in predicting attitudes after exposure to two instructional methods nor after exposure to only teletutorial method. The Diligence Scale also does not show any contribution in

predicting attitudes at any phase of the study.

From the results of the stepwise multiple regression analysis, an attempt was made to predict both achievement and attitudes. The amount of the variation explained by the multiple regression was rather small and since random error takes on disproportionate significance, it is rather difficult to develop a sound regression model from the result. However, the findings do report some phenomena in the future prediction of two different instructional methods related with learner variables in media courses.

Conclusions

The four null hypotheses were related to three areas (Achievement, Preference for learning method, and Attitudes). From the findings in this study related to the null hypotheses, the following conclusions are relevant.

1. The teletutorial instructional method was as effective as the conventional lecture method in terms of providing a learning experience.
2. When students were exposed to the lecture method first, and then to the teletutorial method students seemed to find that the teletutorial instruction did not fulfill their expectations.
3. No difference was found in student preference of learning method in general or in Education 305B regardless of whether they received the teletutorial method followed by the lecture method or the lecture method followed by the teletutorial method.
4. Students with higher grade point averages tended to achieve better regardless of the instructional methods received.

5. After students were exposed to more than one instructional method, students with better media backgrounds tended to achieve better.
6. Students with better media backgrounds in the teletutorial method, tended to have more positive attitudes toward method, content, and expectations.
7. Students with higher GPA in the lecture group, tended to have more positive attitudes toward method, content, and expectations.
8. No consistent trends were found in predicting student attitudes after more than one instructional method was exposed.

Recommendation for Additional Research

The exploratory nature of this study offers only a tentative evaluation of the teletutorial and lecture instructional methods relative to certain variables. To substantiate the findings of this study, the following areas of research are suggested:

1. The study should be repeated with the teletutorial versus lecture method for a longer period of time.
2. A study might be carried out to evaluate students' non-test performance pertinent to media production after teletutorial and lecture instruction.
3. A study to measure students' long term retention of the knowledge through teletutorial and lecture instructional methods might be implemented.

4. A study might be carried out to investigate other types of learner variables (such as creativity, sex, major areas, social need, and achievement need) related to teletutorial and lecture instructional methods.
5. A study to determine the differences between teletutorial and lecture methods in different subject areas might be developed. A different subject area might emphasize the differences in the two methods.
6. A study might be repeated to evaluate students' different cognitive outcomes.

SUMMARY

This study was held with an attempt to determine: if a teletutorial instructional method for teaching Education 305B course would be more effective than a conventional lecture instructional method in terms of achievement; if students' preferences for learning would differ as a result of the exposure to two different instructional conditions; if students' attitudes toward method, content, and expectation would differ as a result of the exposure to two different instructional methods; and if learner variables could be identified to explain the achievement as well as the attitudes in each group. The evaluation instruments used in this study included Achievement Tests, Attitudes Scale, Preference for Learning Inventories, Personality Scale, and other inventories.

The study consisted of two treatment groups. Each received the same information and content but the orders of instructional methods were as follows:

1. group 1: teletutorial method followed by lecture method
2. group 2: lecture method followed by teletutorial method.

The sample used in this study was 10 sections of Education 305B students of Iowa State University. They were randomly assigned into two different groups of 5 sections each. The entire course covered eight weeks in the Winter Quarter, 1974.

First, second, and third test batteries were administered prior to the treatment, at the end of the first phase of the treatment, and at the end of the second phase of the treatment. These measures were used to compare the existence of differences between two different

instructional methods.

Comparisons between the two groups were made through the use of the t-tests:

1. Initial differences on learner variables (measured by GPA, Student Opinion Survey, Media Background Inventory, Art Background Inventory, and Preference for Learning Inventory).
2. Achievement Tests after the first and the second phases of the treatment.
3. Preference for learning method in general and in Education 305B.
4. Attitudes toward method, content, and expectation after the first and the second phases of the treatment.

Further insight into the importance of each learner variable was sought by stepwise multiple regression analyses in which the variables were listed in order of importance.

All the computed t-values were insignificant at both 0.01 and 0.05 level of significance with the exception of the expectation scale (Phase 2).

Paired t-tests were employed to detect the changes on sources of the test-retest for student personality, diligence, and attitude instruments. Three scores that showed significant differences for combined groups were: students' personality (0.05 level), student diligence (0.01 level), and student attitude toward expectation (0.01 level). The scores indicated that students' personality had the tendency to become more external-oriented; student diligence, and attitude toward expectation had dropped between the completion of the first and the second phases of instruction.

In the stepwise regression analyses, to predict Achievement, GPA was the best predictor for both treatment groups. However, after the exchange of the instructional methods sequences, the best predictor for both groups was students' media background instead of GPA.

To predict Attitudes, media background was the best predictor for teletutorial group; GPA and students' art background were the best predictors for conventional lecture group. After the exchange of instructional methods sequence, no predictive pattern was evident.

In predicting Achievements and attitudes, each learner variable was contributing rather small proportion of the variances accounted for (contributing from 3% to 11% of the variances). And the prediction was not significant.

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APPENDIX A. QUESTIONS IN THE SEVEN TELETUTORIAL
TAPES

QUESTIONS IN THE SEVEN TELETUTORIAL TAPESLesson 1. Introduction and Visual Literacy

1. List the three components or learning styles of Education 305B.
2. Write a brief definition of hardware and software.
3. List four media that you might use in a final presentation.

Lesson 2. Displays and Handouts

1. Give an example of a use of dry mounted materials in your subject area. Be as specific as you can.
2. Why would a person not use dry mount tissue and chartex on the same picture?
3. List three ways of using seal lamin in your own class.
4. Which of the dry mount materials would you use to assure long life for pictures to be passed around in class, then put on a bulletin board?
5. What would you do to a large chart to make it easier to handle and to preserve it best?
6. Sketch a drawing which could be used as a spirit master in your subject area.

Lesson 3. Behavioral Objectives and Scripting

Behavioral Objectives

1. What does it mean? Define the word "objectives."
2. Why are behavioral objectives desirable? If you don't believe they are, state your counter-argument.

3. List the three essential components of a behavioral objective.
4. Write a behavioral objective for your subject area.

Scripting

5. List the first four steps in developing a mediated script.
 - a.
 - b.
 - c.
 - d.
6. Write part of a script to go with the behavioral objective you wrote earlier. Use the script sheet with your worksheet and bring it to class for discussion.

Lesson 4. Still Photography

1. List the four basic parts of a camera.
 - a.
 - b.
 - c.
 - d.
2. What is the difference between Kodachrome film and Kodacolor film?
3. What are the four steps to remember to take good pictures?
 - a.
 - b.
 - c.
 - d.
4. Name at least 5 likely sources of relevant pictures for your subject area, including at least one specific magazine.
 - a.
 - b.
 - c.
 - d.
 - e.

5. Write at least one idea for how you could use prints in your area. Not sources, just what use you would have for prints.
6. Jot down at least one specific idea for using slides in your field.
7. List 3 uses for prints in the classroom.
 - a.
 - b.
 - c.
8. List three uses of slides in the classroom.
 - a.
 - b.
 - c.

Lesson 5. Motion Photography and Video Taping

1. List three filming techniques you might use in motion photography.
 - a.
 - b.
 - c.
2. What are the three steps in focusing the camera?
 - a.
 - b.
 - c.
3. Describe briefly something that could be demonstrated on video tape in your subject area.
4. List four uses of video tape for the classroom teacher.
 - a.
 - b.
 - c.
 - d.

Lesson 6. Audio Taping

1. List four advantages of tape recordings.
 - a.
 - b.
 - c.
 - d.
2. What causes the signal to be placed on the audio tape?
3. State which type of recording system is most generally suited to classroom use.
4. Are all audio cassettes interchangeable or compatible with one another?
5. List four uses of audio tape in your subject area and grade level.
 - a.
 - b.
 - c.
 - d.

Lesson 7. Overhead Transparencies

1. Describe a teaching moment you could conduct with a transparency.
2. Sketch a model, opaque object, or device that could be used on an overhead, for your own teaching.
3. Explain how you could create a unique learning situation for your students using an overhead projector.
4. List important guidelines to remember in making effective transparencies.
5. Explain how this visual could be redesigned to make a more effective transparency.

**APPENDIX B. SCRIPT FOR TELETUTORIAL LESSON 7:
OVERHEAD TRANSPARENCIES**

SCRIPT FOR TELETUTORIAL

LESSON 7: OVERHEAD TRANSPARENCIES

Volker - Tien

Teletutorial
Symbol of I. R. C.
(6 sec.)

Music up
(Switched-on Bach)

Lesson 7:
Transparencies and
the Overhead
Projector

Produced by
Roger Volker
and
Helen Tien

Dissolve to 2nd tape

Transparency of
"art work - No. 1"
on overhead
(very slow, pan,
tilt, zoom)
(about 45 sec.)

2nd tape
(Switched-on Bach)

FADE OUT

Change transparency

FADE IN

Transparency of "art
work - No. 2"
(very slow, pan,
tilt, zoom)
(about 45 sec.)

Fade music

Volker

Those examples you've just seen were done by students in an art workshop. They drew the transparencies while listening to the music of the moog synthesizer. We thought these would serve as a good intro to this TT lesson.

(Superimpose in name)

I'm Roger Volker and this is the 7th lesson in our TT sequence. We'll be discussing transparencies and the overhead projector.

Zoom in to book

The behavioral objectives are found in your manual - MEDIA FOR TEACHERS. They are:

Given an idea in a specific subject area, the student should be able to design and produce a transparency, using either direct or indirect production.

Given black and white drawings or illustrations, a student should be able to incorporate them into a transparency.

Given a transparency original, the student should be able to make a variety of transparencies in various color combinations.

Given a variety of lettering devices the student should be able to produce lettering for a transparency original.

Given a magazine picture on a clay base paper, the student should be able to produce a color-lifted transparency.

Given a specific subject area, the student should be able to use a variety of special techniques, including moving parts devices, polarized plastic, opaque objects, or a white-sheet screen.

You already have the worksheet for your answer to our questions. We'll ask you to fill the worksheet as you work on the lesson.

Volker at overhead to write with felt pen

We've divided the lesson into 4 parts. I'll list those for you here:

The first segment will deal with some of the simpler ways you can use ordinary transparencies in teaching. I'd like to introduce Helen Tien, who'll explain more about transparencies like this.

Pan to Helen

You've already seen a transparency used to summarize a process -- the 4 segments of this lesson.

Transparency of "Color lift process"

Here's a commercial transparency that summarizes another process -- the production of color-lifted pictures from books and magazines. (USE CARD-BOARD "WINDOWS" TO REVEAL STEPS).

- Note the use of cardboard windows ...
- Transparency of
"Join the fun..."
- Here's another one with cardboard masks, showing the use of the "revelation" technique.
- Transparency of
"Symphony
Orchestra"
- Not all overlays have to be cardboard masks. Here are some overlays that add info sequentially.
- Transparency of
"Euglena"
- And you can use an overlay for testing purposes... Give info one day, next day make a quiz with an overlay.
- Transparency of
"Use of Thermofax"
Yellow and black
- You've noticed the use of color. You can get transparencies in colors, like this:
- or this:
- Transparency of
"Letter 'A'"
Yellow on opaque
- or this:
- Transparency of
"Shields"
green on clear
- You may wish to add color, as these examples show.
- Transparency of
"Boy, is our face
red"
- Transparency of
"3M Brand
Transparencies"
- There is a wide variety of transparencies. You won't remember them, but here are some examples.
- Show book
- We have a book of examples at our service desk in the Instructional Resources Center.
- Transparency of
"Paramecium"
- You don't need fancy techniques. These hand-lettered examples work perfectly well.
- Transparency of
"A boy"
- You can add color by a variety of techniques which we'll explain in class, using felt pens in color, special paint-on colors, or...
- Transparency of
"An overhead showing
overlays"
- ... color adhesive film. Note color can be added to each overlay too, as needed.

Transparency of
"Page from Daily"

You can even run copies from the newspaper or other printed copy. We'll cover more ideas in class.

Helen on camera

Sometimes you may wish to have students make transparencies for discussion purposes in class.

Flip chart

This flip chart set shows two possibilities for uses. For example, in a class.

Set #1

1. The instructor is making assignment as he talks to class.
2. He puts transparencies on screen with assignment on it.
3. He hands out a piece of acetate to each student and requests that the students write on the plastic pieces.
4. Then, he has individual students get up and discuss what they have written.

Or another case ...

Flip chart

Set #2

1. The instructor is making assignment as he talks to class.
2. He puts transparency on screen with assignment on it.
3. He hands out a 8-1/2 x 11 inches acetate to each discussion group.
4. Discussion groups summarize their discussion on acetate.
5. A spokesman from a typical group gets up to discuss what they wrote from their group discussion.

Volker

Now you're ready to answer the 1st question.

QUESTION 1. Describe a teaching moment you could conduct with a transparency.

The second segment of our lesson will show some examples of 3-dimensional objects.

Explanation of these examples briefly

Transparent materials:

1. Pyrex pan, H₂O, vibrator
2. Chemical reactions
3. Bat skeleton
4. 3-M models
5. Electricity demo

Opaque objects:

Dissecting kit

Now we're ready for question 2.

QUESTION 2: Sketch a model, opaque object, or device that could be used on an overhead, for your own teaching.

In the 3rd segment we'll demonstrate some unique techniques.

Explanation of these techniques briefly.

1. Color lifts
2. Polarizing spinner
3. Shadow plays
4. Back drops for plays

Now for question 3.

QUESTION 3. Explain how you could create a unique learning situation for your students, using an overhead projector.

PRODUCTION HINTS

Helen on camera

Since we are going to discuss the detailed transparency production steps in the class, here are just some hints for making a good transparency.

Transparency of "A good visual has..."	Transparencies are good visuals when they have these 4 elements,
Camera on Helen	By observing the transparencies that Dr. Volker presented a moment ago, we can conclude that there are almost unlimited ways in producing transparencies.
Transparency of "Production technique--hand- made transparencies"	To produce a hand-made transparency, you can use any of the devices summarized here.
Transparency of "A Thermofax machine"	Or to use a machine such as the Thermofax.
Camera on Helen	No matter what procedure you use, there is a basic standard for drawing or lettering in order to achieve <u>legibility</u> .
Transparency of "Visibility- standards drawing"	This transparency explains the required minimum width, size and detail pattern.
Transparency of "Visibility- standards lettering"	This transparency explains the required minimum letter height and width. The colored sizes are the recommended sizes. For example, to use VariTyper letters, we recommend 14 point or bigger ones.
Transparency of "When using a typewriter.."	And for typing, we recommend elementary type.
Transparency of "Poor transparency example"	You should never try to introduce too much information on one transparency. Here is an example of a poor transparency.
Camera on Helen	If a great deal of information has to be introduced through transparencies, sometimes you can use more than one transparency to do the job. For example ...
Transparency of "Europe map"	... in a geography class you can use this transparency to teach the global concept about European countries.
Transparency of "Poland"	And for more detailed information of each country, you can use a separate transparency. And, of course, you can go back to your European map to summarize or to reinforce the global concept.

Transparency of
"Cartoon with
letters"

In many cases, written or typed information can be substituted by a cartoon picture, Cartoons are very stimulating with appropriate captions.

Transparency of
"Cartoon without
letters"

Or even without captions... that is why we say that a picture is worth a thousand words.

Helen on camera then
zoom to book

Here is a book called "Clip Art." In this book you can find figures, drawings, and cartoons in almost any aspect. Please ask at the service desk in the Instructional Resources Center for this book.

Camera on Helen

As we have mentioned before, there are unlimited methods in producing a good transparency. After practicing a while you will be able to develop your own guidelines and to produce good transparencies. If you have never thought of using transparencies in the classroom before, we hope you will think and think harder now.

QUESTION 4. List important guidelines to remember in making effective transparencies.

Transparency of
"good visual"

QUESTION 5. Explain how this visual could be re-designed to make a more effective transparency.

**APPENDIX C. REQUIRED ASSIGNMENTS IN
EDUCATION 305B**

REQUIRED ASSIGNMENTS IN EDUCATION 305B

1. Dry Mounted Materials. Produce one sample of each of the following:
 - (a) Chartex. Mount any educationally useful copy on chartex. The chartex should fit the copy firmly and smoothly.
 - (b) Dry Mount Tissue. Mount any educationally useful copy on a hard surface with dry mount tissue, which should not be visible around the edge of the copy.
 - (c) Seal Lamin. Seal laminate any educationally useful copy. The finished product should not curl (suggest lamination of both sides or affix to solid material), and should be free of any surface wrinkles or defects.

On the cover sheet for "Dry Mounted Materials" describe the concept to be taught with these materials.

2. Script. Develop a complete script for teaching a single concept in your major field using at least two forms of media. Each script frame should identify the media used, a sketch or clear description of the content of the media product (written in the frame), and an accompanying verbal presentation in outline or verbatim form. Scripts are to be prefaced with a statement of the (a) grade level and subject area, (b) behavioral objectives.
3. Spirit Duplication. Produce ten copies of an original spirit duplicating master in at least two colors. The ten copies are to be accompanied by a one-paragraph statement of (a) grade level and subject area, and (b) concept being taught. Copies are to be clear and unwrinkled.
4. Transparency. Produce a thermal transparency from your own original and frame the transparency. The content should visually communicate a key point of a concept related to your field of study. A one-paragraph statement to accompany the transparency should include (a) grade level intended, (b) subject, and (c) concept being taught. Use at least one of these techniques; LeRoy lettering, dry transfer letters, stencil, or Varityper.

APPENDIX D. PERSONALITY SCALE

STUDENT OPINION SURVEY

This is a questionnaire to find out what you think about events in our society. In each pair of statements, select the one you believe to be more true than the other. Blacken the answer (either a or b) on the answer sheet. There should be only one answer for each numbered pair of statements. There are 29 pairs in this survey. Put your name, social security number (in identification number column), class section number (in the grade or class column), instructor's name, date, etc., and SURVEY I (in name of test column) on the answer sheet.

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try, some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what he is like.
9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely, if ever, such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is useless.
11. a. Becoming a success is a matter of hard work, luck has little to do with it.
b. Getting a good job depends on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
b. By taking an active part in political and social affairs, the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as luck.
19. a. One should always be willing to admit his mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22.
 - a. With enough effort we can wipe out political corruption.
 - b. It is difficult for people to have much control over the things politicians do in office.
23.
 - a. Sometimes I can't understand how teachers arrive at the grades they give.
 - b. There is a direct connection between how hard I study and the grades I get.
24.
 - a. A good leader expects people to decide for themselves what they should do.
 - b. A good leader makes it clear to everybody what their jobs are.
25.
 - a. Many times I feel that I have little influence over the things that happen to me.
 - b. It is impossible for me to believe that chance of luck plays an important role in my life.
26.
 - a. People are lonely because they don't try to be friendly.
 - b. There's not much use in trying to please people, if they like you, they like you.
27.
 - a. There is too much emphasis on athletics in high school.
 - b. Team sports are an excellent way to build character.
28.
 - a. What happens to me is my own doing.
 - b. Sometimes I feel that I don't have enough control over the direction my life is taking.
29.
 - a. Most of the time I can't understand why politicians behave the way they do.
 - b. In the long run the people are responsible for bad government on a National as well as Local level.

THE SCORING KEY OF ROTTER INTERNAL-EXTERNAL LOCUS OF CONTROL SCALE

The scoring key of Rotter Internal-External Locus of Control Scale the I-E. The answers are in External direction.

<u>Item Number</u>	<u>Key Answer</u>
1	x
2	a
3	b
4	b
5	b
6	a
7	a
8	x
9	a
10	b
11	b
12	b
13	b
14	x
15	b
16	a
17	a
18	a
19	x
20	a
21	a
22	b
23	a
24	x
25	a
26	b
27	x
28	b
29	a

APPENDIX E. ATTITUDE SCALES

NEIDT ATTITUDE SCALE - FORM A

This scale has been prepared so that you can indicate how you feel about this class. Please respond to every item on the answer sheet. Put your name, social security number (in identification number column), class section number (in the grade or class column), instructor's name, date, etc., and Attitude Scale - Form A (in the name of test column) on the answer sheet. The 1 through 5 scale is related to your feeling about each item.

- 5 - if you strongly agree with the statement
- 4 - if you agree but not strongly so
- 3 - if you are neutral or undecided
- 2 - if you disagree but not strongly so
- 1 - if you strongly disagree with the statement.

Remember, the only correct answer is the one which actually represents how you feel about this class.

1. I am satisfied with the methods used in teaching this class.
2. My attitude toward this class is less favorable than it was.
3. There is not enough contact between teacher and students in this class.
4. I like the method used in teaching this class.
5. Too much emphasis has been placed on topics that are unimportant.
6. I can see no advantage of this method of teaching over other methods.
7. This class exceeds my highest expectation.
8. Some students benefit more than others from the method of teaching this class.
9. I have neutral feelings toward the subject matter of this class.
10. The presentation of this class is paced too fast.
11. I am pleased with the teaching method used for this class.
12. I am disappointed with this class.
13. I find it easy to study this subject because I am really enthusiastic about it
14. I am forced by the method in this class to spend too much time on material I already know.
15. Teachers of all classes should employ the method used to teach this class.
16. Students do not participate enough in this class.
17. The method used to teach this class delays our progress through the material.
18. I remember the material in this class because of the method used to present it.
19. I did not think I would learn as much in this class as I have.
20. The teaching method used in this class doesn't give me enough freedom.
21. My attitude about the way this class is taught is one of enthusiasm.
22. The method of instruction used in this class could be improved greatly.
23. The topics presented in this class are well organized.
24. This class has not fulfilled the hopes I had for it.
25. I have not had a chance to review when I wanted to in this class.
26. The subject matter of this class is interesting.

NEIDT ATTITUDE SCALE - FORM B

This scale has been prepared so that you can indicate how you feel about this class. Please respond to every item on the answer sheet. Put your name, social security number (in identification number column), class section number (in the grade or class column), instructor's name, date, etc., and Attitude Scale - Form B (in the name of test column) on the answer sheet. The 1 through 5 scale is related to you feeling about each item.

- 5 - if you strongly agree with the statement
- 4 - if you agree but not strongly so
- 3 - if you are neutral or undecided
- 2 - if you disagree but not strongly so
- 1 - if you strongly disagree with the statement.

Remember, the only correct answer is the one which actually represents how you feel about this class.

1. The methods used in teaching this class are satisfactory as far as I am concerned.
2. I am less favorable toward this class than I was.
3. This class should have more contact between teacher and students.
4. I like the teaching method used in this class.
5. Too much time in this class has been devoted to unimportant topics.
6. I cannot see that this method of teaching has any advantage over other methods.
7. All my expectations have been exceeded in this class.
8. Some students, but not others, benefit from the method of teaching this class.
9. I feel indifferent toward the subject matter of this class.
10. The subject matter presented in this class is paced too fast.
11. I am glad that this class was taught using this method.
12. This class has been a disappointment to me.
13. Because of the enthusiasm I have for this class I find it very easy to study this subject.

14. The method used in this class forces me to spend too much time on material I already know.
15. The method used to teach this class should be used for all classes.
16. There is not enough participation by students in this class.
17. We could cover the material faster if some other method of teaching were used.
18. The method of presentation in this class explains why I remember the material.
19. I have learned more in this class than I thought I would.
20. My freedom in this class is curtailed by the teaching method.
21. The way this class is taught leaves me enthusiastic.
22. The method of instruction used in this class need extensive improvement.
23. This is a well organized class.
24. I had hopes that this class would be better than it is.
25. When I wanted to review in this class I have not had a chance.
26. I am interested in the subject matter of this class.

THE POSITIVE AND NEGATIVE LOADING OF THE THREE
MEASURES IN NEIDT ATTITUDE SCALE

Expectation		Content		Method	
Item No.	Loading	Item No.	Loading	Item No.	Loading
2	-	5	-	1	+
7	+	9	-	3	-
12	-	13	+	4	+
19	+	23	+	6	-
24	-	26	+	8	-
				10	-
				11	+
				14	-
				15	+
				16	-
				17	-
				18	+
				20	-
				21	+
				22	-
				25	-

PREFERENCE FOR LEARNING INVENTORY

These questions have been prepared so that we can understand more about your preference of learning methods. Please respond to every item honestly. Answer directly on this question sheet.

1. Name _____

2. Social security number _____ 3. Section number _____

4. Date _____ 5. Major _____

6. In courses, my preference for instruction is:

5	4	3	2	1
Strongly prefer TV method and other individual approaches	Some preference for TV method	Equal preference, indifferent, don't know	Some preference for lecture and discussion method	Strongly prefer lecture and discussion

7. In Education 305B, my preference for instruction is:

5	4	3	2	1
Strongly prefer TV method	Some preference for TV method	Equal preference, indifferent, don't know	Some preference for lecture and discussion method	Strongly prefer lecture and discussion

APPENDIX F. ACHIEVEMENT TESTS

ACHIEVEMENT TEST I

I. S. U. Education 305B

Please answer the following questions on the answer sheet. Put your name, social security number (in identification number column), class section number (in the grade or class column), instructor's name, date, etc., and Achievement Test I (in name of test column) on the answer sheet.

1. If you want to preserve a large road map and make it easier to handle or to fold, which of the following methods should you select?
 - a. mount on chartex
 - b. seal lamin both sides of the map
 - c. dry mount on light weight construction paper
 - d. seal lamin the picture and the put chartex on the back of the picture.
2. When using reflex spirit masters, the most inconvenient point for teachers is that:
 - a. The original material (for the Thermofax machine) has to be in black ink
 - b. it makes less than 25 good copies
 - c. it is difficult to correct errors on a reflex master
 - d. it is expensive to use
3. Which of the following is not an important general guideline for producing display materials?
 - a. use rather large illustrations
 - b. give clear and detailed information
 - c. use bright colored pens to add details to large cutouts
 - d. consider combing different dry-mount techniques
4. Which of the following does not belong in the cognitive domain?
 - a. knowledge
 - b. evaluation
 - c. synthesis
 - d. selection
5. Which of the following is correct?
 - a. an opaque projector can only be used in a lighted room
 - b. an opaque projector can only be used in a darkened room
 - c. an opaque projector can either be used in a lightened room or a darkened room
 - d. the lighting conditions for using an opaque projector depend on the materials to be used

6. What system of photography provides the most "instantaneous" pictures?
 - a. Instamatics
 - b. Pentax single-lens reflex
 - c. Polaroid
 - d. Twin lens reflex

7. Which of the following group of numbers is the most logical sequence for shutter speed on a 35mm camera?
 - a. 30, 60, 125, 250
 - b. 10, 20, 30, 60
 - c. 0.4, 0.8, 1.2, 1.4
 - d. 100, 200, 300, 600

8. Frequently a photo essay is more effective when used with:
 - a. ditto handout
 - b. recorded audio tape
 - c. 16mm film
 - d. slide set

9. The first step in planning instruction is:
 - a. select audiovisual materials
 - b. select a teaching unit
 - c. state behavioral objectives
 - d. write a detailed teaching plan

10. Good picture taking depends on the combination of:
 - a. light size, light time, focusing
 - b. ASA number, light size, focusing
 - c. film speed, light size, type of camera
 - d. ASA number, focusing, quality of lens

11. Which type of film needs the least light?
 - a. Ektachrome-X (ASA 64)
 - b. Kodachrome II (ASA 25)
 - c. Tri-X black and white print (ASA 400)
 - d. Polaroid color prints (ASA 75)

12. Which of the following is the most logical sequence for apertures on a camera? (From small to big opening in order)
 - a. 16, 11, 8, 5.6, 4, 2.8
 - b. 2.8, 4, 5.6, 8, 11, 16
 - c. 0.4, 0.8, 1.2, 1.4, 2.8, 5.6
 - d. 1, 1/2, 1/30, 1/60, 1/25, 1/250

13. An important benefit of behavioral objectives is:
- a. they make expectations rather clear which will make learning more enjoyable
 - b. they guide teachers to produce media in a easier way
 - c. they make it more convenient to evaluate the change
 - d. they help the teacher to choose learning activities as well as to emphasize the learning process
14. Which of the following words is too ambiguous to use in a behavioral objective?
- a. identify
 - b. know
 - c. categorize
 - d. describe
15. The correct temperature and time for dry mounting is:
- a. 225° - 5 sec.
 - b. 225° - 10 sec.
 - c. 275° - 10 sec.
 - d. 275° - 5 sec.

ACHIEVEMENT TEST II

I. S. U. Education 305B

Please answer the following questions on the answer sheet. Put your name, social security number (in identification number column), class section number (in the grade or class column), instructor's name, date, etc., and Achievement Test II (in name of test column) on the answer sheet.

1. Among the following courses which would benefit most by using television instruction?
 - a. College English
 - b. Primary reading
 - c. College biology
 - d. College math

2. A monitor is a:
 - a. Television receiver
 - b. Camera
 - c. System of television receiver, camera, and microphone
 - d. Visual picture

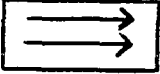
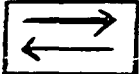
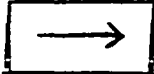
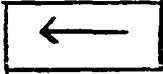
3. A single concept film is a:
 - a. 16mm sound film 2-3 minutes in length
 - b. 35mm film teaching a certain type of technique
 - c. 8mm film or loop
 - d. Any type of short film limited to classroom use

4. In producing a super 8mm film, the most important consideration is to:
 - a. Use a detailed script as guideline
 - b. Use a tripod to prevent camera movement
 - c. Focus the camera in operation, and use zoom
 - d. Edit the film after the film is processed

5. Which of the following techniques uses motion photography and cannot be replaced by still photography.
 - a. Steps of the time lapse of a flower blooming
 - b. Animation of a cartoon
 - c. Biology lab action
 - d. Facial expressions in a drama practice

6. When you use an audio tape, a 7" reel (1200 feet) tape which plays 1 hour (by 3 3/4 ips) will play how long at 7 1/2 ips:
 - a. 30 minutes
 - b. 2 hours
 - c. 1 hour to 30 minutes depends on whether it is music or speech
 - d. None of the above
7. In dubbing or transferring prerecorded sound from one source to another, you would:
 - a. Locate the output of the playback device and the input of the recorder
 - b. Locate the input of the playback device and the output of the recorder
 - c. Use a microphone which should be placed closely to the speaker
 - d. Use a microphone but record in an audio lab to insure adequate reception
8. To edit a tape, put the splicing tape on the:
 - a. Dull side
 - b. Glossy side
 - c. Either side which does not have the recording
 - d. Depends on the type of audio tape
9. The best available transparency film to use when using a magazine photo as a master is:
 - a. Wash and run transparency
 - b. Opaque (type 128) transparency
 - c. Half-tone transparency
 - d. Black line on clear background (type 127) transparency
10. Which of the following statements is false:
 - a. A color-lifted transparency is an economical method using any type of magazine picture
 - b. A color-lifted transparency can use the seal-lamin technique as well as by contact paper technique
 - c. A color-lifted transparency is more colorful than other types of transparencies
 - d. A color-lifted transparency sometimes has problems regarding the degree of transparent and quality if mainly depending on the magazine picture instead of producing technique
11. What is the minimum letter size on a transparency?
 - a. 1"
 - b. 1/3"
 - c. 1/2"
 - d. 1/4"

12. To produce a transparency original, which of the following letters is not producible through a Thermofax machine?
- a. India ink
 - b. Soft pencil
 - c. Dry-transfer letters
 - d. Cut-out letters from newspaper copy
13. Compared with reel to reel tapes, cassette tapes will not produce high quality tapes because the tape speed is limited to:
- a. 1 7/8 ips
 - b. 3 3/4 ips
 - c. 7 1/2 ips
 - d. 1 ips
14. One of the most important reasons for using overhead projectors is:
- a. The transparency can contain more detailed information
 - b. Student's attention can be manipulated
 - c. Students can better view the material
 - d. Using transparencies with overlays facilitates note-taking
15. Which diagram indicates a stereo recording?

- a.  b.  c.  d. 

APPENDIX G. OTHER INVENTORIES

MEDIA BACKGROUND INVENTORY

These questions have been prepared so that we can understand more about your media background. Please respond to every item honestly. Answer directly on this question sheet. DO NOT use separate answer sheet.

1. Name _____
2. Social security number _____ 3. Section number _____
4. Date _____ 5. Year of University (circle) 4, 3, 2, 1
6. Major _____
7. Have you ever taken a college course taught by television? _____
If so, which one? _____
8. Have you ever been in a college class that utilized individualized instruction? _____ If so, which one? _____
9. Are you familiar with the following equipment? Please check the proper answer on each item.

	expert in use of the equipment (4)	can operate at minimal level (3)	familiar with, but can't operate (2)	have had no contact (1)
Overhead projector	_____	_____	_____	_____
Opaque projector	_____	_____	_____	_____
Audio tape recorder	_____	_____	_____	_____
Video tape recorder	_____	_____	_____	_____
35mm camera	_____	_____	_____	_____
Super 8mm camera	_____	_____	_____	_____
Thermofax machine	_____	_____	_____	_____
Dry mount equipment	_____	_____	_____	_____
Ditto machine	_____	_____	_____	_____
Slide projector	_____	_____	_____	_____
Super 8mm projector	_____	_____	_____	_____

10. Have you ever produced any type of media materials? _____
If so, please check the answer:

Audio tape	_____
Video tape	_____
Transparencies	_____
Ditto handout	_____
Slides	_____
Still photography	_____
Super 8mm films	_____
Display materials	_____

ART BACKGROUND INVENTORY

These questions have been prepared so that we can understand more about your artistic background. Please respond to every item honestly. Answer directly on this question sheet. DO NOT use separate answer sheet.

1. Name _____
2. Social security number _____ 3. Section number _____
4. Date _____ 5. Major _____
6. Which one of the following statements best describes your ability in art?
 - _____ Have won awards or prizes for my art work.
 - _____ Have formal training in art beyond required courses.
If so, how many? High school _____ College _____
 - _____ Have had only required art courses.
If so, how many? High school _____ College _____
 - _____ Have had no art training.
7. Which of the following statements best describes your attitude in art?
 - _____ I like to do art work.
 - _____ I don't mind doing art work.
 - _____ I don't like to do art work.

DILIGENCE SCALE

Please answer the following question on the back of this same answer sheet.

I spent _____ hours each week on Education 305B, including class hour, tape, lab, etc.

APPENDIX H. PEARSON CORRELATION COEFFICIENTS
OF SIGNIFICANTLY CORRELATED LEARNER
VARIABLES

Pearson correlation coefficients of significantly correlated learner variables

	GPA	Rotter 1	Rotter 2	Achievement 1	Achievement 2
GPA					
Rotter 1					
Rotter 2		0.72**			
Achievement 1	0.25**	0.17**			
Achievement 2				0.15*	
Previous TV course experience		-0.14*	-0.17*		
Previous individualized instruction course experience					-0.14*
Equipment familiarity	-0.21*				0.22**
Materials familiarity					0.20**
Art ability	-0.14*			-0.14*	
Art attitude					
Preference for learning in general 1					
Preference for learning in Ed. 305B1				-0.17**	
Preference for learning in general 2	-0.16*				
Preference for learning in Ed. 305B2					
Diligence Scale 1					
Diligence Scale 2					
Attitude toward method 1					
Attitude toward content 1					
Attitude toward expectation 1			-0.14*		-0.19**
Attitude toward method 2					
Attitude toward content 2					
Attitude toward expectation 2					

*
p < .05

**
p < .01

	Previous TV course experience	Previous individualized instruction course experience	Equipment familiarity
GPA			
Rotter 1			
Rotter 2			
Achievement 1			
Achievement 2			
Previous TV course experience			
Previous individualized instruction course experience			
Equipment familiarity			
Materials familiarity		0.48**	
Art ability			
Art attitude			
Preference for learning in general 1	0.26**		
Preference for learning in Ed. 305B1	0.32**		
Preference for learning in general 2			
Preference for learning in Ed. 305B2			
Diligence Scale 1			
Diligence Scale 2	0.17*		-0.17*
Attitude toward method 1			
Attitude toward content 1			
Attitude toward expectation 1		-0.19**	
Attitude toward method 2			
Attitude toward content 2			
Attitude toward expectation 2			

	Materials familiarity	Art ability	Art attitude	Preference for learning in general 1	Preference for learning in Ed. 305B1
GPA					
Rotter 1					
Rotter 2					
Achievement 1					
Achievement 2					
Previous TV course experience					
Previous individualized instruction course experience					
Equipment familiarity					
Materials familiarity					
Art ability					
Art attitude			0.42**		
Preference for learning in general 1					
Preference for learning in Ed. 305B1			0.14*	0.53**	
Preference for learning in general 2				0.23**	
Preference for learning in Ed. 305B2					0.20**
Diligence Scale 1	-0.23**				
Diligence Scale 2					
Attitude toward method 1					
Attitude toward content 1					
Attitude toward expectation 1					0.26**
Attitude toward method 2					
Attitude toward content 2			0.16*	0.14*	
Attitude toward expectation 2				0.15*	

	Preference for learning in general 2	Preference for learning in Ed. 305B2	Diligence Scale 1
GPA	-0.16*		
Rotter 1			
Rotter 2			
Achievement 1			
Achievement 2			
Previous TV course experience			
Previous individualized instruction course experience			
Equipment familiarity			
Materials familiarity			
Art ability			
Art attitude			
Preference for learning in general 1			
Preference for learning in Ed. 305B1			
Preference for learning in general 2			
Preference for learning in Ed. 305B2	0.46**		
Diligence Scale 1			
Diligence Scale 2			0.21**
Attitude toward method 1	0.16*		
Attitude toward content 1		0.18**	
Attitude toward expectation 1		0.18**	
Attitude toward method 2	0.15*	0.15*	
Attitude toward content 2	0.14*	0.18*	
Attitude toward expectation 2	0.21**	0.21**	

	Diligence Scale 2	Attitude toward method 1	Attitude toward content 1	Attitude toward expectation 1
GPA				
Rotter 1				
Rotter 2				
Achievement 1				
Achievement 2				
Previous TV course experience				
Previous individualized instruction course experience				
Equipment familiarity				
Materials familiarity				
Art ability				
Art attitude				
Preference for learning in general 1				
Preference for learning in Ed. 305B1				
Preference for learning in general 2				
Preference for learning in Ed. 305B2				
Diligence Scale 1				
Diligence Scale 2				
Attitude toward method 1				
Attitude toward content 1			0.70**	
Attitude toward expectation 1			0.46**	
Attitude toward method 2			0.44**	0.41**
Attitude toward content 2			0.38**	0.48**
Attitude toward expectation 2	-0.14*		0.23**	0.25**

	Attitude toward method 2	Attitude toward content 2	Attitude toward expectation 2
GPA			
Rotter 1			
Rotter 2			
Achievement 1			
Achievement 2			
Previous TV course experience			
Previous individualized instruction course experience			
Equipment familiarity			
Materials familiarity			
Art ability			
Art attitude			
Preference for learning in general 1			
Preference for learning in Ed. 305B1			
Preference for learning in general 2			
Preference for learning in Ed. 305B2			
Diligence Scale 1			
Diligence Scale 2			
Attitude toward method 1			
Attitude toward content 1			
Attitude toward expectation 1			
Attitude toward method 2			
Attitude toward content 2	0.78**		
Attitude toward expectation 2	0.52**	0.56**	
