AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

1. SUBJECT CLASSIFICATION

A. PRIMARY: Education

B. SECONDARY: General Education

2. TITLE AND SUBTITLE

Effects of behavioral objectives, introduction, pretest, and programmed instruction text on learning from instructional film

3. AUTHOR(S)

Song, Yoo-jae

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1974	176 p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS

Floeida State University, College of Education, Gainesville, Florida 32601

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

9. ABSTRACT

The study used three separate experiments. The first showed three different American History instructional films (A: "Age of Discovery", B: "1492, Saga of Western Man", and C: "Jamestown") with three variables, behavioral objectives, introduction, and pre-test, to 83 eighth graders. Results found that the effectiveness of the three variables were different for each film. The second experiment showed Film A to 212 seventh graders, this time omitting the first experiment's listening comprehension test, attitude scale and delayed retention test. No significant differences were found among the performances of the control groups. A linear programmed instruction text was applied in the third experiment, revelating significant effects on learning from Film C, with the exception of behavioral objectives. This experiment's 185 seventh graders were categorized into high and low prior-knowledge groups. Further findings indicated that students in the high prior-knowledge group performed significantly better than those in the low prior-knowledge group on the post-test. However, there were no treatment/aptitude interactions among any students regardless of group category.

10. CONTROL NUMBER	11. PRICE OF DOCUMENT
PN-AAC-561	
12. DESCRIPTORS	13. PROJECT NUMBER
	14. CONTRACT NUMBER: CSD-2945 211(d)
	15. TYPE OF DOCUMENT

AID 590-1 (4-74)

PN-AAC-501

CENTER FOR EDUCATIONAL TECHNOLOGY•COLLEGE OF EDUCATION•FLORIDA STATE UNIVERSITY

EFFECTS OF BEHAVIORAL OBJECTIVES, INTRODUCTION, PRETEST, AND PROGRAMMED INSTRUCTION TEXT ON LEARNING FROM INSTRUCTIONAL FILM

BY
YOO JAE SONG

ABSTRACT

The purpose of this study was to investigate the effects of presentation of behavioral objectives, introduction to films, pretest, and programmed instruction text prior to actually showing the instructional film in learning American History. The study included three separate experiments.

The first experiment involved three different instructional films (A: Age of Discovery, B: 1492, Saga of Western Man, & C: Jamestown) with three variables, i.e., behavioral objectives, introduction, and pretest. Dependent variables were students' performance on the immediate posttest and delayed retention test, attitude toward instructional film use for the study of Social Studies, and scores on STEP: Listening test. Prior to the experiment, all students took a listening comprehension test. One day after the listening test, the students (83 8th graders) were ramdomly assigned to four groups, i.e., EO, EI, EP, and CO. Prior to showing of the films (a) students in EO group were given behavioral objectives, (b) students in EI group received introduction, (c) students in EP group took a pretest, and (d) those who assigned to CO group received no treatment. At the end of the experiment, an attitude scale (Remmers' edition) was given to all students. Two weeks after the posttest, an announced delayed retention test was conducted for each film. The delayed retention test was identical to the posttest of each film.

The results of the first experiment showed that the effectiveness of behavioral objectives, introduction, and pretest vary according to each different film. An analysis of variance on the data of Film B revealed significant effects of previously mentioned variables on the posttest; however, there were no significant differences among the variables in the results of Film A and Film C on their respective posttests. An analysis of covariance indicated that there were no differences among all four groups on the delayed retention tests for all films. Two-tail t-tests showed that there were no differences between the immediate posttest scores and those of retention test on each film. Inspection of of listening comprehension scores of the students and their performance on both tests by the Pearson Product-Moment method indicated positive relationships. Also, attitudes among students of the four groups did not differ significantly, showing positive attitudes (73% to 79% agreement) toward the use of instructional films in the Social Studies classes.

The second experiment was a replication of one of the first experiments, using 212 7th graders with Film A: Age of Discovery. The listening comprehension test, attitude scale, and delayed retention test were omitted. Only the main treatment effect on the immediate posttest was examined. An analysis of variance of the obtained data showed that there were no significant differences betweem the performance of the EO, EI, EP, and CO group.

A linear programmed instruction text was applied in the third experiment, which revealed significant effects on learning from the Film C: Jamestown. However, the effect of the second variable, behavioral objectives, was

not significant. In this experiment, all students (185 7th graders) were tested with a pretest and, based on the results, students were categorized as high and low prior knowledge groups. Students in the ET group were given a programmed instruction text prior to the film showing, students in the EO group received a list of behavioral objectives, and students in CO group received no treatment.

Since intact classes were used rather than random assignment of the students, an analysis of covariance, adjusting I.Q. score as a covariate, was used to analyze the data in this experiment.

Further findings indicated that students in the high prior knowledge group performed significantly better than those in the low prior knowledge group on the posttest; however, there were no treatment/ aptitude interactions among all students, regardless of their group category.

ACKNOWLEDGMENTS

The author wishes to express her gratitude and sincere thanks to her major professor, Dr. Robert M. Morgan, for his untiring support, enthusiasm, encouragement, and suggestions throughout the study. Without his intellectual and financial support and assistance this study could never have been completed.

The author is also grateful to her directing committee: Special thanks goes to Dr. H. Stoker for his statistical and editorial assistance and support, Dr. B. Story, Dr. S. Grant, and Dr. W. Broderick for their advice and valuable comments.

Special appreciation is conceded to Dr. R. K. Branson, Dr. G. T. Rayner, Dr. J. McLanahan, Dr. F. J. King, Dr. Yung Dug Lee, Professor Dong Chol Kim, and Professor Hae Tchang Rhee for their continuous encouragement and considerations during the doctoral studies and the writing of this dissertation. Also, gratitude goes to Dr. J. Furman and Dr. P. Grisé for their comments and information for the study, Ms. Susan Reichman and Ms. Bonnie King for their assistance and encouragement, Dr. Anne Petty for her editorial assistance, and members of the Army project for their concern and generosity.

Acknowledgement is due to the Center for Educational Technology, Computer Center, and Evaluation Service of the Florida State University; Dr. Smith, Ms. Deans, Mr. Woodruff, and 8th grade students of the FSU Developmental Research School; Mr. Carmichael, Ms. Webster, Ms. Carter,

and 7th graders of the Elizabeth Cobb Middle School; School Board of Leon County; and Purdue Research Foundation for their participation and corporation in the experiments.

The author expresses her deepest appreciation to her American parents, Mr. and Mrs. J. E. Hood, for their love, support, and encouragement. It would have been impossible for her to continue her graduate study at FSU without their help, support, and considerations. Special gratitude is extended to her parents in Korea for their patience and understanding.

Finally, the author's most heartfelt thanks goes to her grandmother who no longer is with us, but still is the source of her motivation of the study.

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I. INTRODUCTION

The use of film to complement regular classroom instruction is a common instructional technique. Since 1918 (Sumstine) much research has been conducted and published about the effectiveness of film in instruction.

The practical application of the rich expression and communication possibilities of the film medium gives it a double role for educational purposes. As a means by which the teacher gives instruction, the film becomes an instrument which is not merely suitable to make a certain subject matter outwardly visible, but which moreover makes it possible for the subject matter to be experienced and enjoyed. It also becomes an important means for the student to learn how to assimilate the subject matter (Peters, 1955, p.119).

An instructional film is of value only to the extent that it contributes to more effective learning and greater student comprehension. The influence of instructional film depends not only on the content and the treatment of the film, but also the characteristics of the audience and the social and instructional situation in which the film is presented.

It can be said that film is a learning tool of tremendous power in the cumulation of knowledge and ideas, contributing something to learning which is otherwise unobtainable. However, merely to use any instructional film does not guarantee more effective learning by the students.

Consequently, there should be some efforts to find better ways of using instructional film to achieve optimal learning for its viewers.

What changes might be made in the use of the instructional film to increase its effectiveness? Various studies have indicated an increased efficiency for the instructional film when it is properly used by the classroom teacher. But what is the proper way of using it? Common sense seems to indicate that to use film to its full advantage, great care must be taken in the preparation and presentation; yet there is no demonstrated best way of using it. Prior research suggests that purposeful use, organizational outline, introduction, summary, pretesting, posttesting with the knowledge of results, introducing the film and stating the purpose and importance of showing it, use of study guides, etc., are characteristics of good film use. In this study four particular variables--behavioral objectives, introduction, pretest, and programmed instruction text-- were investigated in order to determine their effects on learning from film.

The purpose of this study was to apply and examine "The Model for Instructional Film Use," previously developed by the author, in actual classroom situations, and to investigate the effects of presentation of behavioral objectives, introduction to the film, pretest, and programmed instruction text prior to actually showing the instructional film in learning American History.

This study included three separate experiments. The first one involved three different instructional films with three variables, i.e., behavioral objectives, introduction, and pretest. The second was a replication of one of the above experiments. And the third was an experiment with two variables, i.e., behavioral objectives and programmed

instruction text. Two of the three instructional films used in the first experiment were reapplied in the second and third experiments.

Statement of the Problem

The use of behavioral objectives, introduction, and pretest have been shown to have facilitative effects on learning with instructional film. However, some negative results have been reported and no research was found which addressed the specific question regarding differences among the above mentioned variable effects on learning with instructional film. Also, the efficacy of a programmed instruction text used in learning from instructional film in a classroom situation has not yet been verified experimentally. Are there any differences in students' performance when behavioral objectives, introduction, pretest or programmed instruction text are given to the students prior to the instructional film showing? Can a most effective method be identified?

In addition, the facilitative effects of above variables on learning from instructional film have not been extensively studied in actual classroom situations.

Another factor which influences students' learning from instructional film is their listening ability. In this study the relationship between students' performance and their STEP: Listening Test score was investigated.

Due to natural forgetting, it is anticipated that students will do less well on a delayed retention test than on an immediate posttest. This also was investigated.

The previously developed "The Model for Instructional Film Use" was used as the conceptual framework in this study and whether the model

is simple and easy enough to apply to actual classroom situation was questioned.

Hypotheses

The following hypotheses were postulated for this study:

1. Acquisition and retention will be greater under EO presentation condition than under CO condition (EO>CO);
2. Acquisition and retention will be greater under EI presentation condition than under CO condition (EI>CO);
3. Acquisition and retention will be greater under EP presentation condition than under CO condition (EP>CO);
4. Acquisition and retention will not differ among EO, EI, and EP presentation conditions (EO=EI=EP);
5. Immediate posttest scores will exceed delayed retention scores under all conditions (IP>DR);
6. There will be a positive relationship between students' performance and their scores on STEP: Listening Test;
7. Students under EO, EI, and EP presentation conditions will show more positive attitudes toward the instructional film use in the classroom than students under CO condition;
8. Acquisition will be greater under ET presentation condition than under CO condition (ET>CO);
9. Acquisition will not differ between EO and ET presentation conditions (EO=ET);
10. There will be no difference on acquisition between students with high prior knowledge and students with low prior knowledge (HG=LG);
11. There will be no aptitude/treatment interaction for prior knowledge.

levels and EO, ET, and CO presentation conditions.

All statistical hypotheses used in this study to test the experimental hypotheses assume the null form of no significant differences among population means.

Definitions of Terms

EO - Experimental group receiving behavioral objectives before film showing.

EI - Experimental group receiving introduction before film showing

EP - Experimental group receiving pretest before film showing

ET - Experimental group receiving programmed instruction text before film showing

CO - Control group receiving no treatment before film showing

IP - Immediate posttest which was given right after film showing

DR - Delayed retention test which was given two weeks after film showing

HG - High prior knowledge group (Students who scored five or more right on the pretest were categorized as high prior knowledge group, otherwise, as low prior knowledge group.)

LG - Low prior knowledge group

II. CONCEPTUAL BACKGROUND

The Roles of Instructional Film

Background of Instructional Film

The first motion picture, Edison's Kinetoscope, was introduced in 1894, but it could be viewed by only one person at a time. Eastman's invention of celluloid in 1889 and its later improvement as a film base led to the development of projectable films.

Between 1894 and 1925, films were developed without sound. By 1930, sound movies in 35mm form had become well developed and standardized. Now films in 70mm, 35mm, 16mm, 8mm, and super 8mm (since 1965) are available.

Films designed specifically for classroom use are usually called instructional films and are available to schools of all levels through various service agencies.

Differences between Film and Television in Instruction

It is a fallacy to consider that because of the close similarity between instructional film and instructional television the results from instructional television research can be applied directly to instructional film research.

Davies (1973) has explained that to a very large extent, film and television can be regarded as substantially identical media, although the two forms of presentation tend to be used rather differently in instruction. Television, on the whole, tends to be used either as an alternative to live teaching or as a means of allowing students to

observe themselves or others at work. On the other hand, films are used for a wider range of situations. However, there is still a tendency to restrict them to dramatic or theatrical presentations, field trips or travelogues, and demonstrations of particular phenomena (p. 117).

Dale (1969) has indicated the major differences between them is that film lacks the immediacy of live television. It cannot show us the actual event in the process of its occurrence, i.e., an on-the-spot telecast. Even though a film must leave out something of the original reality that it presents, it still can be more real than the reality itself using proper editing techniques. And it is somewhat more abstract than television (p. 390).

In summary, the television has greater convenience when delivered via cable to the classroom while the film allows projection on a large screen. Moreover, libraries of programs, organization of production, and marketing are more readily available on instructional film than on television. Greater freedom, variety, and flexibility in film presentation are available because of film processing, editing, and the rich library of experimental films built up over the past decades. Film also can be used in the classroom that does not have access to television. Thus, film and television have different roles to play in instruction.

For recent reviews of the literature on the effectiveness of instructional television, the reader should refer to Chu and Schramm (1967) and Dubin and Hedley (1969).

Advantages and Limitations of Instructional Film

Film characteristics which need evaluation for instructional use were described by Smith and Van Ormer (1949) as follows:

Color
Music
Emphasizers to direct attention
Voice characteristics
Multiple sensory presentation
Esthetic tone or artistic qualities
Emotional tone
Dramatic vs. factual presentation
Humor
Personalized commentator
Units clearly marked off
Pacing and rate of development
Verbalization characteristics
Time relations of sound track and picture
Fact frequency and film length
Animation
Modified motion
Camera viewpoint and perspective (p. 8).

The evolution of the instructional film has been largely a result of the stimulus of wartime demands and the new experiences for training large numbers of people in a short time. As a result of research conducted in instructional film use, it is clear that there are both advantages and limitations to instructional film.

A. Advantages. The twelve basic advantages were summarized by Dale (1969). Film Can:

1. Present certain meanings involving motion
2. Compel attention
3. Heighten reality
4. Speed up or slow down time
5. Enlarge or reduce the actual size of objects
6. Bring the distant past and the present into classrooms
7. Provide an easily reproduced record of an event
8. Create reality, reveal the invisible
9. Build a common denominator of experience
10. Influence and even change attitudes

11. Promote an understanding of abstract relationships

12. Offer a satisfying esthetic experience (p. 398).

Flory (1971) has indicated flexibility, repeatability, accessibility, creativity and compatibility with other media including television, computers, books, tape recorders, overhead projectors, slides, and filmstrips as advantages of instructional film.

Davis (1931) has emphasized the repeatability, since this factor is not present when a lecturer has but an hour with his audience and anything which cannot be captured by the printed word vanishes with him.

It is interesting to find that only some of these advantages were emphasized before 1950. Stanford and Mackeith (1949) have divided the advantages into two chategories. On the objective side film presentation is convenient for demonstrations that do not always work smoothly in front of a class, for illustrations that are costly to present in actuality each year or fixed objects that the students cannot conveniently visit. The subjective advantages are that because films are costly to make, they may contain more careful pedagogy than any teacher could be expected to provide continuously. The authors also indicated that the method of presentation of films in a darkened room is advantageous for optimum concentration.

According to Fern and Robbins (1947) a good instructional film should have a strong correlation between the content of the film and the learning situation, accuracy of information, good instructional technique as a built-in feature, and satisfactory technical quality of production.

B. Limitations. What are the limitations of instructional film, or motion picture, when applied in education? Fern and Robbins (1947)

identified cost, mechanical problems, adaptability, and projection facilities as limitations. Dale (1969) listed seven limitations--effectiveness and expensiveness, incorrect time concepts, incorrect size concepts, distorted impressions or conclusions, student comprehension, administration and mechanical difficulties, and instructor's role (additional time and effort are required).

In his book Film and Education, Elliotte described some limitations as follows:

> One limitation to use of motion picture in education is cost. Good films are expensive to produce and to buy....A second limitation is that films are perishable and do not withstand wear and tear like many other less expensive teaching materials (such as books)....A third limitation is that teachers often have difficulty securing a film when it is most needed....Finally, there are limitations inherent in the nature of the motion picture itself. It moves too fast on the screen for contemplative study unless projected many times (p. 35).

In summary, the limitations of film can be categorized as:

1. Cost

   Expensiveness and effectiveness do not always balance. Film cost is getting cheaper comparatively, however, it still remains as a problem.

2. Student perception and comprehension

   Film may give incorrect time and size concepts to the young students. Distorted impressions or conclusions may be derived by the students.

3. Administration and mechanical problems

   Some teachers cannot work well with instructional film or any other instructional devices; therefore, they avoid them. Administration and scheduling may cause a problem.

4. Instructor's role

For the teacher, additional teaching time and effort are required for optimum film communication.

The above limitations should be considered when a film instruction is designed or when a new instructional film is produced.

Table 1

Summary: Advantages and Limitations of Instructional Film

Advantages	Limitations
Dale (1969) Motion Compel attention Heighten reality Speed up or slow down time Enlarge or reduce the actual size of objects Bring the distant past and the present into classrooms Provide an easily reproduced record of an event Create reality, reveal invisible Build a common denominator of experience Influence and change attitudes Promote an understanding of abstract relationships Offer a satisfying esthetic experience	Dale (1969) Effectiveness and expensiveness Incorrect time concepts Incorrect size concepts Distorted impressions or conclusions Student comprehension Administration and mechanical difficulties and instructor's additional load
Davis (1931) Repeatability	Elliotte (1948) Cost Perishable Teachers have difficulty securing films Move too fast on the screen for contemplative study
Flory (1971) Accessibility Creatibility Flexibility Repeatability Compatibility with other media	
Stanford and Mackeith (1949) Convenient for demonstration May contain more careful pedagogy Compel attention	Fern and Robbins (1947) Cost Mechanical problems Adaptability Projection facilities
Fern and Robbins (1947) Good instructional technique as a built-in feature	

Instructional Film and Learning

Rationale

The Commission on Instructional Technology declared that the heart of education is the student learning, and the value of any technology used in education must therefore be measured by its capacity to improve learning (Tickton, 1970, p. 9). The objectives of the instructional film research programs are to seek facts and principles which will make possible to improve generally the effectiveness of instructional film when used for teaching. Films serves many functions: (a) The film is a means of expression, a language and an art, based on modern technology. (b) The film is an aid to learning, autonomously, or more usually, as a means for multiplying and reinforcing the teacher's role. (c) The film is an instrument of research (Maddison, 1966).

It can be said that the idea of using film in education for instructional purposes was developed from the experience of military training in the most effective way in the shortest possible time by using films. According to Fern and Robbins (1947):

> In a sense, it has taken a war to fulfill an inventor's dream. When Thomas A. Edison conceived the idea of projecting moving pictures on a screen, he foresaw his inventions as a new tool for education....It was not until the emergancy of war that motion picture and other types of instructional films were fully recognized for what they are--machine tools of modern education--and utilized extensively in national programs of instruction (p. 9).

The Bureau of Naval Personnel of the U.S. Navy Department has listed the following reasons for using instructional film as training aids: (a) to learn more, (b) to remember longer, (c) to increase interest, (d) to make training uniform, (e) to build morale, and (f) to save

time (Fern & Robbins, 1947).

Based on reviews, digests, and analyses of experimental reports from various areas of learning, including learning from film, Smith and Van Ormer (1949) have outlined their statement of learning principles:

A. Motivation and incentives. The learner must feel an urge (desire, drive, need, set, tension) to learn certain things if there is to be much learning. Within certain limits the more intense the motivation the greater will be the learning. Subprinciples are effectiveness of goals, knowledge of progress, praise and reproof, suggestion, realism and practicability, anticipation of early use, examination set, and challenge.

B. Self activity. The individual learners only by his own activity (mental and/or physical). What he learns are the responses he makes and organizes. Within certain limits, the more active the mental or physical learning behavior, the greater will be the learning. Self activity can be divided into (a) mental practice of a process which includes verbalizing the task, visualizing the task, and imaging the feel of the task; (b) raising and answering questions in presentation; and (c) learner propagandist.

C. Seeing and organizing relationships. The learner ordinarily has some tendency to see and organize patterns or relationships in the material or activities which he is learning. But this tendency cannot be trusted to form the desired relationship unaided. This organizing process must be directed and facilitated for effective learning, and includes meaningfulness, patterning and identifiability.

D. The principle of effect (reinforcement of responses). In much learning a selective process occurs in which the individual tends to

acquire and repeat those actions which have one or more of the following results: (a) led to success in that situation, (b) tended to satisfy the motivating conditions, and (c) been perceived as means to desired ends. It can be applied by checking by the learner and demonstration of wrong methods.

E. Practice and/or repeated presentation. Mere practice or repeated presentation of material has very little, if any, strengthening effect upon learning. Repetition apparently merely affords the opportunity for strengthening or weakening factors to affect the learning. The subprinciples are exercise under favorable conditions, over-learning, realistic practice, part-whole practice, spaced practice, minimum delay of practice, and review.

F. Generalization, application of transfer. This principle can be divided into generalization set and recognized similarity.

G. Characteristics of the learner. They include general mental ability (intelligence); educational level; previous knowledge or skill possessed in relation to specific material to be learned; specific aptitudes, e.g., mechanical, spatial, verbal, perceptual speed, kinesthetic sensitivity (muscle sense); facility for learning through the eye or the ear; attitudes and interests; past experience with various teaching techniques such as lectures, films, etc. (pp. 2-7).

A simple explanation of the method of using audio-visual materials to be aid learning follows in essence the analysis of the learning process by Miller (1957):

Drive (motivation)--The student must want something.
Cue (stimulus)--He must notice something.

> Response (participation)--He must do something.
> Reward (reinforcement)--He must get something he wants (p. 63).

Miller explained that each of these stages in learning can be made richer, more meaningful, and more vivid by the proper use of instructional film.

Maynard (1971) suggests the "Celluloid Curriculum," i.e., teaching with films which are basically not classroom oriented. He emphasizes that film can be an independent part of the curriculum. With exceptionally well selected summaries of commercial (or entertainment oriented) films he describes his own way of using feature films in his classroom.

Cook (1974) also indicates film's thirteen potential values to education, emphasizing its role as the great humanizer, by quoting 35 films such as "Boiled egg," "The hand," and "Why man creates."

An instructional film is of value only to the extent that it contributes to more effective learning and greater student comprehension. However, in the actual situation, films and teachers can only stimulate and guide the learning process, since learning is a voluntary experience that demands a willing and willful effort on the learner's side.

Only a few research studies have been done to examine the relationship of instructional film and learning theory. Yet, this is the field which needs significant results through proper experiments.

Some Theoretical Hypotheses on Film Research

The necessity to develop guiding hypotheses for instructional film research has been recognized, and Carpenter (1953) has outlined and presented eight theoretical hypotheses for the instructional film research program at the Pennsylvania State College.

Carpenter stated that the objective of the instructional film

research program is to discover facts and principles for increasing the effectiveness of the instructional sound motion picture for rapid mass training. His assumptions were that effects are revealed in terms of changes in the behavior of subjects and an important requirement of film research is the controlled production of experimental film variables for comparative test purposes.

The hypotheses are (Carpenter, 1953, pp. 38-52):

Sign similarity hypothesis. Films whose signals, signs, and symbols have high degrees of similarity (iconicity) to the objects and situation which they represent will be more effective for most instructional purposes than films whose signals, signs, and symbols have low degree of "iconicity" (e.g., film representations of the performance of know tying).

Releasor-organizer hypothesis. The signals, signs, and symbols of sound motion pictures function principally as releasors and organizers of meanings and responses in human subjects (e.g., The psychological concepts of accumulative experience, apperceptive mass, prior set, predisposition to respond and reintegrative learning all relate to and may be used to support this releasor-organizer generalization).

Channel capacitance hypothesis. There are definable limits to the amount of content which can be channelled through a sound motion picture, i.e., through the visual and auditory modalities of perception; and there are limits to the capacities of individuals for reacting to, imprinting, and retaining the information or content (e.g., levels or amount of verbalization (speech) in films relative to their instructional efficacy).

Perceptual reinforcement hypothesis. Multisensory modalities of communication (e.g., the relative contributions of pictorial and sound

channels to learning from films).

Information-dependability hypothesis. Information contained in sound motion pictures and perceived and learned by viewers varies widely in functional dependability, and that films with high degrees of information dependability are most effective for instructional purposes (e.g., the relative effectiveness of black and white and color films; also this hypothesis relates to a basic and necessary attitude of viewers toward learning from films).

Personal need hypothesis. The effectiveness of the film will be importantly determined by the degree to which it activates personal needs in viewers for the information represented in the film (e.g., participation, anxiety, motivation, etc.).

Personal involvement hypothesis. Other things being equal, the instructional film which provides for the greatest degree of personal involvement in the visually presented situations will be most effective (e.g., comparision of the effectiveness of a demonstration photographed from the learner's viewpoint vs. the observer's viewpoint, or the effect of religious films).

Learning principles hypothesis. The established principles of learning which have been developed by psychological and educational research have varying degrees of applicability in film mediated instruction, and that the application of the best of these principles will improve the effectiveness of film instruction (e.g., repetition and reinforcement, trial-error-and-success learning).

The above eight hypotheses may be helpful in identifying variables related to teaching effectiveness of instructional films.

Film Literacy

Film literacy can be defined as special abilities involved in learning from film. These abilities may relate to sustained observation and interpretation of such film techniques as dissolves, close-ups, intercuts, etc.

The basic importance of a good film is the fact that while it cannot substitute for reality, it can isolate and intellectualize meanings not always evident in a first-hand experience (Wagner, 1954). According to Peters (1955) the film-image is a three dimensional "sign," i.e., a symbol of the reality perceived, a symbol of the inner self of the maker of the film and a signal for the spectator. Moreover, film does not communicate in the same way printed literature does. It communicates by images and sounds organized around elements of composition, rhythm, tempo, pace, lighting, color, music and symbols (Lacey, 1972). Unfortunately, we have little knowledge of how pictorial-verbal symbol systems function in the whole process of communication and learning. Peters (1955) has declared "Not only in a metaphorical but also in a proper sense the 'film medium' may be regarded as 'language'--in other words as a system of possibilities for representation, expression, and communication" (p. 202). Also he indicated that for the youthful and inexperienced spectators the understanding of film language presents a series of difficulties and only by teaching youth how to see, can they be taught at the same time how to benefit by what culture wishes to impart to them in a visual manner. Peters emphasized that the positive development of visual education stands or falls with this development of "seeing."

Wagner (1954) has illustrated the problem of film language with

an example of primitive adult audiences. Some African tribes could distinguish color film from black and white only by identifying the former as the picture "where the sun was shining"(p. 218).

Where does the concept "Film Literacy come from"? Snow and Salomon (1968) reported as follows:

> Individuals who differ in amount or kind of previous experience with film seem to differ also in the extent to which they profit from film learning treatments. Hoban and Van Ormer (1950) called this "film literacy" and Pryluck and Snow (1967) suggested that this unique aptitude represents a kind of comprehension of the "grammer" of cinema (p. 353).

Snow and Salomon considered this variable extremely important in multicultural educational settings where students of different social classes or cultures differ both in degree and kind of media literacy.

Total illiteracy in film, Forsdale and Forsdale (1970) determined, is the inability to recognize familiar objects, people, places, and action when they are shown directly and without contrivance on the screen. This sort of illiteracy corresponds to the unlettered illiterate who stares without comprehension at print on the page. It is not merely that he cannot get the message; he has no key to the code. Not only some primitive people have difficulty in identifying the content of both still and moving pictures, but also some modern people have similar problems (but for different reasons). Forsdale and Forsdale give the interesting example that Picasso, who was told by an American soldier that his paintings couldn't be understood because nothing on the canvas looked the way it really is, answered by pointing to the picture of the soldier's girl friend and saying, "She's an attractive girl, but isn't she awfully small?"

Forsdale and Forsdale (1970) classified the bottom rung of what they call the "Film Literacy Ladder" into five types:

1. Level One

   Total non-comprehension: The picture is as an arcanum symbol as the printed word to the unlettered. The viewers do not recognize clear, simple motion pictures of familiar objects.

2. Level Two

   The audience comprehends separate objects, but cannot assemble simple, familiar movements portrayed into meaningful actions. They identify parts of a picture but make no sense of a whole action portrayed in the film.

3. Level Three

   Confusion cf picture with reality: They do not realize that the picture is not reality.

4. Level Four

   No understanding of the simplest film conventions, such as close-up, dissolves, wipes, etc.

5. Level Five

   Comprehension indifference to the unfamiliar: They have little or no understanding of, and certainly no interest in scenes, people, objects, which are not already familiar to them.

Film does not show the real thing; rather, it shows a limited, particularized, necessarily distorted view of it. It is a fallacy that no effort on the part of the viewer is required, since film is not an automatic medium which guarantees comprehension.

It is possible that a considerable range of film literacy would be found among people, even in developed countries, if we had more sensitive tools to detect it. The level of literacy in film could be

increased if direct instruction were to be given students in film comprehension, especially for young students with deprived background. As increasing use of the moving image becomes more ubiquitous in education, the increasing complexity and subtlety of film technique will require our attention to this new kind of problem--film literacy.

The most profound reason for teaching about how to watch film is to enable the students to engage himself with the medium at the richest and deepest level possible (Forsdale & Forsdale, 1970). Therefore, it is necessary to teach students how to "read" film.

The Model for Instructional Film Use

Problems

As early as 1939, Wise described instructional film as "an instructional tool of tremendous power in the accumulation of knowledge and ideas and in the development of attitudes and appreciations. Because of its peculiar nature, that is the unique quality of motion which it possesses, it contributes something to learning which is otherwise unobtainable" (p. 142). Fern and Robbines(1947) also indicated that it is very important that all schools take advantage of new teaching aids and techniques for instruction because the tempo of learning can be accelerated by instruction with films. For a half centry much research has been conducted and film has been considered to be an effective teaching tool, offering several advantages. Yet, teachers still utilize the lecture method of teaching for most of their instruction and regular use of film in the classroom is far from a universal practice. Like other kind of media, instructional film is not a panacea for all the ills in the classroom. But why do many teachers avoid this valuable

teaching tool? Parker (1970) pointed out several answers for the above question as follows: (a) Available films seldom offer the opportunity to effect desired educational objectives. In most instances film is used in isolation and not as an integral element of an instructional system. (b) Existing projection equipment is often unreliable and too complicated to operate. Constant classroom use demands a kind of service that is not being provided. (c) Finally, film format, film packaging formats, and the necessary film projection hardware are too various. Lack of money, scheduling problems, and teacher's lack of training in use of audio-visual media are other reasons. Wilson (1968) described teachers' responses when they are not well informed about the newer media in education. When they do not understand, teachers become insecure and hesitant in using new materials and machines and accepting new ideas. Their immediate response can be : "Look, for ten years I have taught successfully. Just why should I use a film loop now?" Or rather moderate form, "I'd like to use films, but I don't have time. It is all I can do to keep up with my regular work."

There is another kind of problem, too. Students might consider instructional film as an entertainment and do not give it as much attention and effort as they do for regular lectures. They should be told what to watch, what is the main point, etc.

The above problems can be divided into financial problems, mechanical problems, and instructional problems. In this study only the instructional aspect was discussed.

It was proposed by Salomon and Snow (1968) that in future research: (a) One should expect interaction effects between particular media attributes, learner traits, and learning objectives, rather than main

effects due to media attributes alone. (b) Also, the media attributes under investigation should be explicated in terms of those which lend themselves to psychological research. Concerning the nature of human aptitude and its relevance for instructional research and instructional practice, with particular reference to film and television, they pointed out as the simplest, most extreme argument in their discussion that almost all of the research evidence accumulated to date applies to some generalized "average students," and thus to no one! The point of the argument is not directed at the operation of averaging, but rather against the use of undifferentiated averages as the final arbiters of instructional practice. They emphasized that the problem is rooted in the design of experiment. Another point they made is:

> Upon entering instruction, an individual may be characterized in terms of an aptitude pattern which reflects the prior history and development of that individual. The term "aptitude" refers to any individual difference variable which functions selectively with respect to learning, that is, which appears to facilitate learning in some students and some instructional treatments while limiting or interfering with learning in other students and other instructional treatments. The term does not mean "general mental ability" (pp. 347-348).

This suggests that there has not been enough consideration of the learner's characteristics. Thus, instructional film use can be evaluated in terms of learner characteristics and teacher preferences, but often is not.

Previous review of research indicates that most of the research can be divided into two categories. One is an attempt to find better ways of film production to increase its effectiveness in learning, while the other is to study the effectiveness of already existing films. These

studies have generated several recommendations and suggestions to improving production and use of instructional film.

A recent attempt of the first category is using the principle of programmed instruction to produce instructional films. Although little research has been conducted on this, the rationale for this attempt appears to be sound. Wagner (1954) predicted that "Films of tomorrow will be deliberately designed to stimulate thinking, to change behavior, and to bring about that sense of participation and sharing which characterizes successful communication and effective learning. Teaching films will, accordingly, be more than an accumulation of facts. They will be provocative and challenging. They will be more 'forked-road' situations, and more use of the open ending (p. 218)." In a sense, these are some of the characteristics of the programmed instruction. When using programmed film, with its high degree of internal control, predictions concerning learning outcomes can be made at a relatively high level of confidence. Programmed and traditional films differ also with respect to the emphasis on stimuli and responses. The programmed film is response oriented, while the traditional film is stimulus oriented.

However, Morgan (1973) pointed out that programmed instruction has several serious limitations as follows: (a) it is costly and difficult to develop and use, (b) if used to any degree it tends to bore learners, (c) it often threatens the teacher, and (d) finally, it is disruptive if used in a conventional classroom (p. 28). To a lesser degree these same difficulties may also apply to programmed film. If the above obstacles can be overcome, porgrammed film production for classroom learning, especially for self-paced use, is a promising field.

The Effective Use of Existing Instructional Films

What changes might be made in the use of the existing instructional film to increase its effectiveness? Various studies indicated increased efficiency for instructional film when it is properly used by the classroom teacher. But what is the proper way of using it? It is common sense that to use film to its full advantage, great care must be taken in the preparation and presentation; yet, no one has described and demonstrated the best way of using it. Considering the wide range of learning tasks and conditions there may not be one "best way."

It is suggested from research studies that purposeful use, organizational outlines, introduction, summary, pretesting, posttesting with the knowledge of results, introducing the film and stating the purpose and importance of the showing, use of study guides etc. are good teaching techniques in film use. However, preparing the above supplementary materials would take much teacher's time and effort. It also requires that the teacher knows the film content and thinks through, in advance, the best approach to it. Wagner (1962) complained that too many teachers expect a film to do much more than any film is capable of doing, and reject many pictures for sometimes minor deficiencies which they, themselves, could easily correct or even turn to good account (p. 276). But the fact is that teachers often don't have time.

Seeing is learning, Liotta (1972) explained, and that's especially true for a generation of students that grew up on television. There are learning concepts that most students can grasp best by seeing. In many cases, the student himself is the only one who can properly determine the ideal pace of learning. From his study, Liotta stated that besides saving valuable teaching time by eliminating repetitive instruction, film

can also reach students who are not necessarily oriented toward either textbooks or lecture learning. He indicated that individualized instructional film (or self-paced instruction) should be a universal practice and teachers must become managers of the learning experience in the fullest possible meaning of that term.

By applying an individualized instructional film system, or by a newer form of independent study, teachers would have more free time to prepare supplementary materials for the lessons while students can proceed on their own pace. Is it possible with existing hardware? Gerlach and Fry (1963) found a way of using technicolor 800 projector for self-instructional films. With a simple modification, the projector can be handled, according to individual learning rates, by stopping and running forward the film as desired. The film viewing schedule should allow students to have independent repetitive viewing depending on their needs.

Several changes in education are occuring now: Changes in curriculum content and general teaching method, changes in school design, new emphasis on methods and materials for teaching the disadvantaged, provision of educational centers separate from the conventional school, transformation of the school library into an instructional materials center, and many more. In the future, all the instructional films may stored in the library and the function of the library could become one of managing all the school's learning materials. Heinich (1970) suggested two types of teacher for a better learning situation in his model--media teacher and classroom teacher. Ideally it is the best form, however, the actualization of this idea has the least possibility of implementation in the recent future.

From the above discussion there seems to be a need for a model

which demonstrate the simplest way and most effective way of using instructional film. A possible model is depicted in Figure 1.

Each step of the model will be explained bridfly.

Unit lesson objectives. Stating behavioral objectives should be a common step in any instructional program. Deterline (1968), Engman (1968), and Mager (1962) have indicated the benefits of behavioral objectives. Gagné (1970) also said that an important reason for specifying objectives is so the achievement or nonachievement of the terminal behavior which is aimed for can be known to the instructional designer. This permits proper planning for sequencing of the instruction. The specification of instructional objectives in terms of human performance is necessary to the requirements of measurement.

In this model, unit lesson objectives and entry behavior are considered as given before selecting the instructional film. The teacher or instructional designer chooses the film according to the unit lesson objectives. Other criteria for film selection will not be considered here.

Instructional film preview. Organizational outline, summary, introduction, tests, or other techniques work to maximum advantage when the teacher has previewed the film in question. This procedure is rarely possible with the present demands on the teacher.

This step also allows the teacher to prepare the behavioral objectives for the instructional film.

Prepare instructional film objectives. We cannot expect that the content of the instructional film will exactly correspond to the objectives of the unit. It is desirable to analyze the behavioral objectives for the film. Leestma (1954) emphasized that in order to secure reasonably

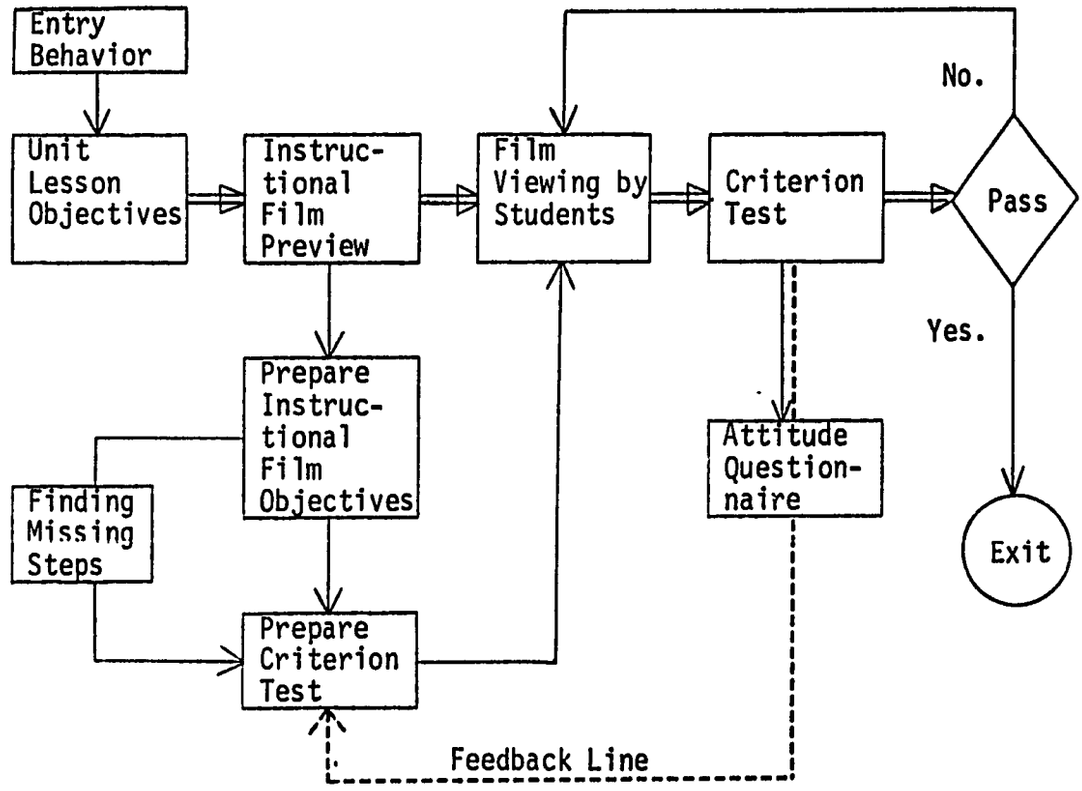


Figure 1. The Model for Instructional Film Use

uniform perception of the significant stimulus, the teacher must assist the students in identifying and structuring the significant stimulus. If the students know what to look for, they are more likely to find it.

Finding missing steps. This step of the model is arbitrarily named as "Finding Missing Steps." The function of this step is to find what supplementary instruction is needed to fulfill the stated objectives. Advanced organizer, outline, summary, guidebook, a list of difficult words, a list of general principles, a series of events, auxiliary materials, or a series of question can be prepared for students. Programmed instruction text can be used and the principle of systems approach can be referred in making decision. Kenny (1949) and Hotchkiss (1937) identified the need of this step for better use of instructional films.

Prepare criterion-referenced test. Announcement of a test to follow the film viewing may produce some anxiety on the part of the learner and also it may lead to increased motivation. By preparing criterion-referenced tests based on objectives it is possible to evaluate the learning from the instructional film.

Field (1971) showed in his study that tests can be used to improve effectiveness of classroom films. He raised the question that if providing reliable and valid question is essential to achievement of specific educational objectives (and sales) by college textbook publishers, why aren't films accompanied by a validated objective examination (p. 262). He proposed that an objective type examination should be provided by subject matter specialists.

Film viewing by the students. Film viewing by the learner can be individualized form and/or classroom learning form in this model.

Film should be viewed by the student, not just shown. Students should be active, not passive, Since the learning is voluntary experience that demands a willing and willful effort on the learner's side, students should exercise initiative in learning from instructional film.

Scheduling and administration should be considered in advance.

Criterion-referenced test. The evaluation of instructional film is to examine the achievement of its purpose. And the purpose of instructional film is instruction. It must teach!

Dwyer (1972) stated that each medium should be evaluated in terms of the learning objectives for which it is best designed. He indicated that comparisions of different media in relation to one type of learning objective or where specific objectives are not identified and reported procedure results which are uninterpretable.

Ideally the criterion-referenced test should be provided by the producers of the film. However, for the time being teachers should make criterion-referenced tests for their students. Previously stated behavioral objectives will help teachers to prepare appropriate tests.

Attitude questionnaire. Wagner (1962) stated that in any case, the reaction of the audience is the final determining factor in the meaning of the film. The purpose of this questionnaire is to assess the attitude of students both concerning the film and the way of using it. Feedback from this evaluation and the above test will reflect and also effect the revision of instruction.

Decision making step. When the student successfully pass the criterion-referenced test, then he can proceed from the filmed lesson to the next instruction. When he fails, repetitive viewing will be provided. More than two failures will alert the teacher that a problem exists and

a discussion between the student and the teacher will be held. To allow a wide choice on the part of the student, and to hold the student until he has reached the desired proficiency level, as suggested by Morgan and Bushnell (1967), the mastery learning principle will be used.

However, one alternative way of this step is that in conventional classroom situation, film showing can be limited on time with proper supplementary instructional material which was selected in the previous step in this model. In this situation, conventional learning principle, instead of mastery learning, will be applied.

Cartridge-loading 8mm film projectors can be used for self-study and retraining of adults, especially in technical and professional fields. As Dwyer (1972) expressed, the effectiveness of visualized instruction is dependent upon the type of visuals used, the method of cuing students to the essential learning cues, relevant student characteristics, the visualized instruction, and the type of educational objectives to be achieved. With these factors in mind the implications of the previously described model should be tested and evaluated in actual learning situation. The model can be used for individualized instruction and/or for regular classroom situation. For regular classroom use the film viewing may need to be scheduled once, twice, or more according to the particular class.

The model should be useful for making existing instructional films more effective in student's acquisition of desired learning outcomes.

A rather broad view of instructional film use was indicated by Lacey (1972) as follows:

> Particularly, a film educator should teach children, rather than any particular subject

> matter or even the qualities of the medium itself. More precisely, a film educator should help children learn how to learn, and how to respond sensitively and effectively to others, how to lcarify their sense of who they are, and how to develop capacities fo choose freely from a variety of alternatives--all in relation and response to the screen. A film educator should foster these aims rather than the acquisition of particular skills or knowledge, valuable as such tools may be (p. 2).

What is the best method of instruction? Greenhill (1967) has answered that one that provides students with a wide variety of learning situations, which will develop the varied learning skills that they will need for continuing their education throughout their life-time. Instructional film can provide such a wide variety if properly used.

III. REVIEW OF THE LITERATURE

The review of the literature was divided into four parts: Comparative research period, Variable research period, Present status of research, and Relevant empirical research. The first three parts present an overview by deducing the trend of research on instructional film. The last part focused on specific empirical research relevant to this study. The comparative period was summarized with the emphasis on the findings and trends in research.

Comparative Research Period (1918-1950)

Experimental study of the motion picture in the classroom instruction began shortly after 1915 (Dale & others, 1937). Sumstine's report "A Comparative Study of Visual Instruction in the High School" was published in School and Society in 1918, and it was one of the earliest published research articles on film use in teaching. Hoban and Van Ormer (1970) have analyzed, summarized, and integrated research findings between 1918 and 1950 in their instructional film research report. It is summarized as follows:

Outcomes of Film Use in Instruction

1. People learn from films.
2. The use of effective and appropriate film results in more learning in less time and better retention of what is learned.
3. Films in combination with other instructional materials are better than either alone.

4. Instructional films stimulate other learning activities.
5. Films facilitate thinking and problem-solving.
6. Films are equivalent to a good instructor in communicating facts or demonstrating procedures.

Principles Governing Film Influence

1. Reinforcement: Films are of great influence when their content reinforces and extends previous knowledge, attitudes, and motivation; they are of least influence when previous knowledge is adequate, and when the film content is antagonistic or contrary to existing attitudes and motivation.
2. Specificity: The influence of a motion picture is specific, not general.
3. Relevance: The influence of a motion picture increases as the content of the film is directly relevant to the audience reaction it is intended to influence.
4. Audience variability: Reactions to a motion picture vary with film literacy, abstract intelligence, formal education, age, sex, previous experience or predisposition of the audience.
5. Picture primacy: The influence of the motion picture is primarily in the picture, secondarily in the accompanying language and/or music, and is relatively unaffected by "slickness" of production.
6. Subjectivity: Response to a motion picture is most intense, efficient, and predictable when the pictorial content is subjective to the audience.
7. Rate of development: Rate of development influences the impact of a motion picture on its audience.
8. Instructional techniques: Instructional techniques built into the

film, or applied by the instructor, substantially increase the instructional effectiveness of a film.

9. Instructional leadership: The efficiency of learning performance of a group to whom a film or filmstrip is exhibited is influenced by the leadership of the instructor who uses the film or filmstrip as well as by the effectiveness of the film or filmstrip itself.

The general problem attacked during this period was the instructional function of the motion picture in relation to (a) other visual aids such as slides, demonstrations, maps and the like; and (b) the more traditional classroom procedures utilizing purely verbal instruction by means of textbooks, supplementary readings, and so on.

It was between 1920 and 1930 that motion pictures came to the attention of educators. Among the pioneers in film experiments are Weber, Joseph J., McClusky, F. Dean, and Freeman, Frank N. The Pennsylvania State University, University of Chicago, Yale University, Air Force, Navy, and Eastman Kodak Company were involved in film experiments.

Until 1930, the motion pictures which were used for experimental purposes were not specially constructed nor were they sound pictures; up to 1930, research was limited to the use of silent films. After sound was added to the film, the comparative effectiveness of sound film and silents was a popular variable in research. Also, speically prepared 16mm motion pictures were created for the use of classroom learning.

During this period, the results of experiments show that better work was accomplished by students taught by film than by those in the control group where no film was used. Teachers were overwhelmingly

convinced that the teaching film was highly effective, however, the film was viewed as an addition to the existing pedagogical devices of the school (Wood, 1929).

Toward the end of this period, fairly large numbers of subjects were used in experiments; for example, a two-year program (1947-1949) was conducted by using approximately 15,000 subjects at the Pennsylvania State University (Carpenter, 1949). Also Jaspen (1950), who designed seventeen different versions of film to teach assembly of the breech block of the 40mm antiaircraft gun, tested them on 2377 apprentice seamen in 1948.

As a result of anlyzing 74 experiments Levine (1937) concluded that if a correct methodology is used, the beneficial results will transcend any initial expenditures or effort involved. He has recommended that research in the field of the educational film must be specific and minute, involving particular and definite elements of subject matter, methodology, film characteristics, educational levels, content, and the interrelation of each with the other and in combination. Lumsdaine (1953) also has criticized that (a) there were no control group and/or no prefilm measurement, and (b) no statistical evaluation of reliability were found among the early research in this period. Hoban Jr. (1937) has indicated seven neglected factors of experimental procedure isolated in the sixty-one studies: (a) typicalness of classroom procedures, (b) comparability of mehtods of instruction, (c) methods of measuring results of instruction, (d) limitations of the control group technique, (e) insufficient analysis of data, (f) diversity of grade classification, and (g) incomplete investigation of problems.

With some exceptions, instructional film research prior to 1950

can be generally characterized as comparative research. In other words, as Allen (1971) criticized, learning from some unspecified film was compared with learning from some unspecified presentation by an instructor or other medium. This was the predominent type of film research for over 30 years.

Variable Research Period (1951-1965)

General Trend

Allen (1971) has described the early part of this period as a transitional period when some of the old values of research were being discarded and new approaches and problems were being investigated. He also stated that it was a period when educational television was still a dream, the term programmed instruction was not even coined, and such exoteric instructional forms as simulation, games, and computer-assisted instruction were beyond comprehension.

The foundation of this period was formed after World War II, and the lead was taken by the military services. Film was regarded as the medium possessed limitless possibilities for study (Wittich, 1953). However, the new medium of television has drawn away much attention and the emphasis in instructional media research switched dramatically from film to television. Therefore, the period from mid-1950 to mid-1960 is labeled by Allen as "the decade of educational television." Greenhill (1967) shows the same viewpoint. These researches were stimulated by a rapidly growing population. A relatively small number of studies have been conducted with comparision of learning from filmed courses, sometimes supplemented by a teacher, with direct instruction during this period.

In their study "Research in Instructional Television and Film," Reid and MacLennan (1967) summarized 333 studies between 1950 and 1965. Most of these studies dealt with specific variables which were thought to effect the teaching effectiveness of instructional films. Several kinds of variables were tested for their effects. For example, inserted questions in films, inserted titles, sound vs. no sound, black and white vs. color, motion picture vs. still picture, animation vs. live photography, attitude, various kinds of attention directing devices, vocabulary difficulty were examined.

In reviewing film and television research during this period, Greenhill (1967) observed two salient characteristics. The first was the number of the studies that had deficiencies in their experimental designs. The most common of these were the use of nonrandom groups and the confounding (uncontrolled mixing) of variables. Some studies provided no evidence of test reliability which makes interpretation of results very difficult. The second was the large number of nonsignificant differences that have been obtained, and even where statistically significant differences were found, there is an absence of differences of large magnitude (e.g., two to one or greater) between different methods of instruction. The reasons for the failure to find large and significant differences may include the following: (a) Measuring instruments were not sensitive enough to detect differences which may have existed. (b) The use of predominantly verbal tests with visual media. (c) Many studies have dealt with comparisions of variables which tend to cancel each others effects. (d) Some experiments were concerned only with single variables which in many cases are not sufficiently potent to produce significant differences in learning. (e) The "law of

compensatory effort" may be operating. This law asserts that student have certain levels of aspiration and that they strive for a particular grade. Therefore, many students will put less effort into a well-taught course and will work harder in other courses which are not being taught as well and where more effort is needed to achieve the desired grade. (f) Finally, comparisions among presentations which simply involve different media are not likely to be fruitful.

Greenhill (1967) has suggested two approaches to find significant differences: (a) Use of additive design in which the experimenter begins with a basic treatment and then progressively adds variables. (b) Also, comparision of the new combination of variables each time with the basic treatment. Variation on this type of approach is the use of the complex multi-variable design involving a considerable number of variables in different combinations.

Review of Variable Studies

VanderMeer (1950) conducted a study comparing groups of students in a ninth-grade biology course which were taught by (a) 44 sound films alone (each film was seen twice), (b) the same film plus specially prepared study guides, and (c) standard lecture-demonstration-discussion methods by a classroom teacher. The results showed no significant differences in student performances on immediate tests or on delayed recall tests after 3 months. However, the "film only" group took about 20 percent less time than the other two treatment groups to complete the course.

Hartman (1960) found that filmed lectures are useful in increasing the knowledge of physics in college freshman. Significant gains were achieved with eleven lectures without outside preparation.

In his study, Allen (1955) reviewed research on the use of film and class preparation and concluded that: (a) teacher introductions and class preparations for film showings result in significantly more factual material learned than merely showing the film without an introduction, (b) teacher introductions to film showings are about equal in effectiveness to reviews after the showings in the teaching of factual information, (c) the prefilm announcement of a test to follow the showing results in increased factual learning over the condition in which no test is announced, and (d) introduction has a motivating effect upon those parts especially covered.

Student participation was studied by Allen (1957). After reviewing verbalization of response, perceptual motor responses, notetaking, knowledge of results, and mental practice, he concluded that generally: (a) learner participation during a film showing will result, under most conditions of instruction, in greatly increased learning from the film; (b) the overt verbalization of responses by the learner during the film showing results in increased learning, and (c) the furnishing of "knowledge of results" of the learned overt response during a film showing also has a positive effect upon learning. He also emphasized that the techniques of participation appear to be important contributors to learning from instructional film.

Northrop (1952) studied the effects on learning of the prominence of an organizational outline in instructional films. As results he found that the addition of titles and commentary material will increase learning if the film is not inherently well organized. Addition of titles to a dramatic or narrative type of film did not seem to increase learning. The less intelligent members of the audience may be expected to profit

more from the addition of outline material. A detailed outline was no more effective than one that stressed the salient points of the film.

More learning occured, VanderMeer and Cogswell (1952) concluded from their study that when the viewers were prepared for the film showing by being told exactly what they were to learn. They also concluded that complex skills can be taught by film alone.

Note-taking was an interesting variable for the researchers. Ash and Carlton (1953) found from their study of note-taking effects during film viewing that note-taking interfered with learning because film did not have pauses and repetition is necessary for note-taking. Minster, Albert, and Power (1961) concluded that class discussion and note-taking is significant in learning; however, in this study the film was stopped periodically for students to take notes.

The relative effectiveness of color and black and white films in instruction has long been a concern of researchers. VanderMeer (1952) found in his study that the use of color in instructional film does not appear to be justified in terms of greater learning on the part of those who view the films. However, the contribution of color in film seems to be related more to the retention of learning than to the immediate acquisition of learning. Sex differences of preference in learning from color films are slight. Zuckerman (1954), Fullerton (1956), Hudson (1959), and Driscoll (1960) sound similar results from their studies.

In 1953 (Carpenter) and again in 1956 (Carpenter & Greenhill), total 63 research reports were reviewed and summarized. Among them items concerning the preparation of film for instruction are (a) specific content in film is required to meet specific instructional objectives, i.e., films with broad superficial content aimed at a generalized audience are

likely to be less effective than films with well specified content aimed at an audience of known characteristics; and (b) films should be prepared for a specific audience. Therefore, production--especially audience-tailored film production--was of concern to the researchers.

Frequency of film showing is another interesting variable. VanderMeer and Cogswell (1952) concluded in their study that showing the film twice produced greater learning than a single showing. McTavish (1949) also reported that the second showing of a film on general science produced significant increases in test scores; increases produced by further showings were not significant. In somewhat different case, Jaspen (1950) and Lumsdaine (1952) showed that repetition of proctical demonstration within a film contributed to teaching effectiveness. Another result was added by a study with Navy trainees. Ash and Jaspen (1953) studied the effects of repetition along with several other variables using 1,100 trainees at the Great Lakes Naval Training Center. They concluded that for the film having a slow rate of content development, significant contributions by repeating the film were found only for the second showing. The third showing of the slow film had little effect. With the fast-paced film three showings were necessary for a significant increase in learning and the second showing resulted in only slightly better performance.

Generally, it can be said that relevant information presented in films and perceived usefulness of the information are the factors which produced changes in attitude. Levonian (1960) conducted a study using 540 UCLA students in education, psychology, public health, and business administration classes to determine opinion change for a film especially produced for a given audience. He found that an audience-tailored film

produces in significant opinion changes.

In 1960, Kantor tested the hypothesis that inserted questions can significantly raise the teaching effectiveness of factual instructional film when such questions are inserted both visually and aurally. The study concluded that it seems to make no significant difference if questions are inserted before or after the content, or if no questions are used at all. Vuke (1962) indicated similar findings. He found in his study that the seventh grade students developed an understanding of basic scientific methodology equally well from a film which contained inserted questions for covert responses and from a similar film with no questions.

Robert and Parchert (1962) attempted to answer the question "How can we secure greater academic returns through use of motion pictures"? They found the use of work sheets (objective questions which set up more specific goals) make a significant difference. In summary, they listed that worksheets can (a) produce increased learning, (b) impress on student's mind definite aims for the viewing, and help to give the film lesson its proper importance, (c) present a task that eliminates the time-conditioned idea that motion pictures are only for entertainment, (d) tangibly anchor certain information thus eliminating the usual film disadvantage of presentation of fleeting information, (e) helps to make the learning more nearly permanent since the worksheet gives both reading and writing experience in a concise form, and (f) when a student takes a worksheet home, he has the kind of specific facts before him that he often likes to discuss with his family.

The principles of learning fundamental programmed instruction has influenced the design of instructional film. Schrog and Holland (1965)

demonstrated that an existing educational film can be converted into a teaching-machine program and thereby gain the advantages shown by programmed material. They claimed that when the concepts to be taught involve time and motion, actual or filmed demonstrations are potentially useful. However, mere passive demonstration by the instructor or by film to a passive audience does not in itself establish the concept. Using teaching machine TMX Min-Max II with the answer mate, the printed portion of the program was presented along with the film sequence to the students. In this program attention of the students is assured as the frames advance only after frame questions have been answered, and the frames are so designed that they are answered only after mastery of the frame's information. The results indicated that the program was highly effective. However, the number of subjects (16 for program group, 6 for film only group) was too small for valid conclusions. The authors also indicated that the results should not be taken as a proof that "programmed instruction" is better than "educational film." It is not possible for a single program or a single film to serve as a representation of its class of media.

Gerlach and Vergis (1965) listed their reasons for offering a self-instructional film course as (a) the teaching-machine movement and programmed textbook, and (b) the sudden surge of interest in cartridged loop films and the several types of projectors designed for such films. With the description of the status of Arizona State University's 8mm workshop, they claim that the low-cost film and projectors appear to be highly amenable to the requirement of self-instruction.

To study to what extent teaching films can be improved by systematically modifying their structure and elements based on results of

tests, VanderMeer, Morrison, and Smith (1965) conducted an experiment showing two films and then their revised forms. Performance on the second revised version was significantly superior to the original version. The types of revisions that "paid off" included the following: introductions, summaries, and outlines; improving the visibility of that which is intended to be seen; the concept of size; attention-directing devices and labels; use of graphics; showing in the video what the audio refers to; changes in structure in commentary; verbal poverty or scarcity; direct statement in commentary versus student influence; and precision phrasing.

As Allen (1959) indicated, motion picture film research, totaling close to 3,000 reported studies at that time, have changed direction to the more rewarding study of the characteristics within instructional films, variations in their use, and their relationships to learners that can make them more effective teaching and/or learning materials.

Present Status of Research (1966-1975)

General Review

Culkin (1970) has described this recent period as " The age of the moving image: Photography got it started. Film got it moving. Television got it into the living room." (p.19). A general trend is trying to understand more precisely the place of media in the instructional process. The structure and sequencing of instruction with particular emphasis on the hierarchical characteristics of the content, the use of advanced organizers, the degree of control exercised over the presentation of content, and other factors relating to the learner action are responsible for leading to increased learning (Allen, 1971). The studies of the

above variables are still in their infancy, but insightful reviews of the progress to date have been made by Briggs (1968), Gagné and Rohwer (1969), and Frase (1970).

Other variables popular for present research are three-way interaction of stimulus, task and learner; structure and sequencing of instruction with instructional media; individualization of instruction; identification and preparation of instructional objectives.

Cowger (1968) concluded from his research that when film choices are offered, interested students retain more from their viewing, and this increased retention seems to hold across differences in I.Q. When the element of choice is absent, it appears that retention is lower and there is corresponding increase in positive correlation with I.Q. scores.

In their study, Allen and Weintraub (1968) found that under most conditions the motion picture is the most effective medium for presenting information to be learned cognitively.

Allen, Weintraub, and Cooney (1968) studied the effects of a film on Oceanography using 477 sixth-graders. Independent variables were response mode, feedback mode, and review mode. They reported (a) the basic conventional film resulted in as great a learning gain as any of the other experimental treatments, (b) there was a tendency for the feedback of the knowledge of correctness of response to aid learning, (c) neither overt nor covert responses were found to be superior under any of the feedback conditions, (d) there were no significant differences in learning among any of the review conditions, and (e) subjects with lower vocabulary achievement interacted more variably with the different experimental variables than did those with higher vocabulary achievement.

Moakley (1968) used a multiple choice test to measure effects of

periodic variations in an instructional film's normal loudness level for relevant and irrelevant film sequences. An analysis of variance for the four experimental groups suggested that higher mean performance was a result of decreases in loudness rather than increases, regardless of relevancy of the material. Another analysis suggested, however, that decreases in loudness for irrelevant material resulted in higher performance than decreases for relevant material. For the three control groups whose film sequences were constantly relevant, more learning resulted from loudness levels both above and below normal than from a normal level. And high performance levels were positively related to high intelligence levels.

Modern cinematographic techniques are far superior to those produced a decade or two ago, allowing for greater control over the viewer's behavior. Gerlach and others (1966) said that the amount of desired learning acquired from an instructional film or other instructional media is largely a function of the control it exerts over the learner's behavior. They suggested two kinds of control. External control is the control that the instructor maintains over the learner's behavior (maintain a quiet room, question or test on topic, etc.). Internal control refers to control over learner responses by stimuli contained in the film itself. These responses, of course, are the behavior related to attainment of the instructional objectives of the film. They claimed when using the programmed film, with its high degree of internal control, predictions concerning learning outcomes can be made at a relatively high level of confidence. It was also explained that such programmed pictures are response oriented, while the traditional film is stimulus oriented.

In their study on individual differences and instructional film

repetitions, Snow, Siebert, and Heckman (1968) found that the changes in correlational patterns across repetitions of the same film were not apparent, though some differences in pattern were noted between films. They indicated the methodological problems involved in research on individual differences in learning and needed further analyses.

Wade (1971) who examined instructional video tape/film accountability suggested a systematic, objective approach to assessing the effectiveness of a video tape/film: (a) Define the target audience for the video tape/film in terms of grade level, ability range, relevant socio-economic characteristics and previous subject area experience. (b) Specify precisely the instructional objectives for the video tape/film. (c) Prepare the criterion test. (d) View the film, analyze, separately, the content of the sound and picture tracks, and list the discrete facts, opinions and skills that each track presents. (e) And, determine if preliminary analysis of video tape/film content leads to the conclusion that it contains the information to answer all or most of the criterion tests (formative and summarive evaluation procedures). He also suggested eleven program principles for producing instructional video tape/film as follows:

1. Define instructional video tape/film.
2. Specify with precision the instructional objectives of the program.
3. Prepare the criterion test.
4. Prepare a list of learner prerequisites, which will provide the programmer with a reference inventory of assumptions concerning student's knowledge of the subject prior to the instruction under plan.
5. Prepare the outline of program content.
6. Prepare a preliminary content sequence.

7. Select the programming strategy to be followed.
8. Write a first draft.
9. Test the first draft.
10. Prepare the second draft.
11. Prepare the program in final form.

Above principles can be used in preparing instructional film lessons.

A self-instructional film should be learner-oriented rather than content-oriented (Gerlach & others, 1968). Its objectives should be stated in terms of observable, specific behavior. The distinguishing characteristic of such terms is that they are subjected to few interpretations. Objectives should be to identify, name, order, describe, and construct. They also pointed out that a self-instructional film must include two considerations--behavior and subject matter. Finally, when the learning task is concerned with simple learning such as paired-associate learning, it is more appropriate not to use a film at all, but rather to use less elaborate and expensive materials--flashcards, for example.

In their book Teaching with Films, Fern and Robbins (1947) pointed out the need of preparation of the teacher. They claimed that teaching films are their own worst enemies. Next to textbooks, they have been misused and abused more than any other media. Some teachers have welcomed films as a device for entertaining and instructing the students without requiring any lesson preparation on the part of the teacher, and the status of teaching films as instructional aids has suffered thereby (p. 82).

8mm Film

Recently Norelco (Philips) introduced a Super 8 projector which combines the features of film strip projector and the motion picture

projector. It is a desk top unit with a small reel projection screen designed to be viewed by one or two persons (Armsey and Dahl, 1973). Newly developed devices and 8mm films have brought individualization into instructional film viewing.

Davis (1965) said that the development of simple and comparatively inexpensive film projecting facilities can result in greater use of films, saving of teaching time in the classroom, and more flexibility in the production of instructional motion pictures. Recently developed easy-to-load cartridges containing 8mm film loops provide excellent opportunities for establishing self-instructional situations, especially for teaching laboratory, language, and reading skills.

"Why 8mm?" Gerlach (1970) asks. Why are they called the new teaching tool? He concludes that their accessibility, economy and practicality have brought them to this position. Since 1963, there has been a significant development of 8mm hardware. Today there is an even wider variety of hardware available in the 8mm field.

The development in 8mm film has made film accessible to a degree never previously possible. Because of comparatively low cost and ease of operation, libraries of 8mm film can be established in each school, or even in individual classrooms. The 8mm film is also an important medium for increasing instructional effectiveness. It can easily be repeated as desired. The silent 8mm film can be used by the teacher to raise questions to elicit responses from the students. These characteristics carry with them the implication that 8mm films can be used for individualized instruction and for small group work.

The megnetic sound track offers another unique possibility for heightening instructional effectiveness. Since sound can be played back

on a tape recorder, or erased and replayed whenever desired, the sound on a magnetic sound track can be used, reused, erased, or re-created.

Peck (1969) described the use of 8mm in team teaching. She considers 8mm film as a good medium for a small group or individuals. She said 8mm films are ideal for special projects in extending skills, expecially in social studies, science, and even mathematics. They can also be used in the disciplines to introduce units, introduce and reinforce concepts, and review content.

In summary, films in 8mm format are practical, accessible, and effective aids for the classroom teachers as well as for the course designers. It is possible to design entire course with audience-tailored 8mm films.

Relevant Empirical Research

Behavioral Objectives

The cornerstone of instructional technology is the proposition that the goals of education and training can be operationally defined in terms of learner performance (Morgan, 1969, p. 96). Mager's book Preparing Instructional Objectives (1962) has drawn much interest and attention from classroom teachers as well as researchers. Objectives facilitate student learning by providing direction for that learning (Duchastel & Brown, 1974). In a recent review of previous research, Duchastel and Merrill (1973) indicated that the results obtained from the research are inconsistent. It was pointed out that although a number of studies have shown facilitative effects, an equal number of studies have failed to demonstrate any significant differences.

Leestma (1954) stated that the teacher must assist the students in

identifying and structuring the significant stimulus. A similar view, expressed by Allen (1971), was that the structures sequencing of instruction, the use of advanced organizers, the degree of control exercised over the presentation of content, and other factors relating to learner action appear to lead to increased learning.

In spite of much strong support for behavioral objectives as the most valuable component in the learning process, some educators still question the value of such objectives (Atkin, 1969; Ebel, 1970; Eisner, 1967; Kliebard, 1968).

Only a few instructional film studies investigated the effects of behavioral objectives. The interaction of student personality factors and behavioral objectives on recognition learning with a ten-minute color film on "The Monarch Butterfly" was investigated by Kueter (1970). The sixthe, seventh and eighth grade students were blocked into three different degrees of personality traits and then randomly assigned to a behavioral objectives group or a no-objective group. An immediate recognition test and an identical test administered one week later showed a superior performance on the part of the behavioral objectives groups. However, the data indicated that objectives were less effective for students with personality traits of submissiveness, self-control, considerateness, or low ergic tension.

Smith, Roberts, and Taylor (1973) conducted a study to determine the effects of providing the learner with instructional objectives prior to instruction with non-objective-based material from which the objectives were inferred by the experimenters. Sixty-four university students enrolled in an audio-visual education course were randomly assigned to one of four treatments in which they received either no objectives,

partial lists of objectives (even- or odd-numbered), or a complete list of objectives for an instructional film, "The Remarkable Schoolhouse." Performance on an 18-item criterion test was significantly higher for students receiving objectives than for students receiving no objectives. However, there was no significant difference between the performance of students receiving partial lists of objectives and those who received no objectives. The investigators inferred that presentation of objectives did not appreciably limit students' attention to content not relevant to the objectives. They concluded that the presentation of objectives enables the learner to focus his attention on relevant material.

VanderMeer and Cogswell (1952) also concluded from their instructional film study that more learning occured when the students were told exactly what they were to learn.

Introduction

One of the purposes of using an introduction, as well as objectives or a pretest, is to provide motivation for students while furnishing them information about what they are supposed to learn. The relative effectiveness of various introductions to a film were tested by Murphy (1962). Subjects were 271 seventh-graders and the topic was learning about light. The students were randomly assigned to one of five groups: (a) received the technical vocabulary in the film as an introduction, a description of the film and its purpose, and a set of questions directed at the concepts in the film, (b) received the description and vocabulary only, (c) received the description only, (d) had no introduction (film only), and (e) had no film or introduction. All students took a 72-item test to measure learning from the film immediately after and four weeks later. The results showed that all film groups' scores were significantly higher than the

non-film group, but there were no significant differences among the three introduction treatment groups or the film-only group on either the immediate test or retest scores.

Allison and Ash (1951) tested 480 college students to determine how well they learned under different degrees of anxiety. They concluded that an introduction used to increase anxiety uniformly increased scores on a test of material contained in the film.

Teacher introductions and class preparations for film showing resulted in significantly more factual material learning (Allen, 1955). Northrop (1952) also indicated that the addition of titles and commentary material will increase learning if the film is not well organized.

On the contrary, Fullerton (1956) found that scores of students in the film only group were significantly higher than scores of students in the anticipatory remarks (introduction) group on both immediate and delayed posttests. The key variables in the study were black and white and color films, anticipatory remarks, learning, and retention. Subjects were 551 eleventh- and twelfth-graders.

To determine the effectiveness of various ways of presenting a film, the Commonwealth Office of Education in Sydney, Australia (1950), conducted a study using six different methods. These are (a) 10-minute introduction, film, followed by a test; (b) introduction, film 10-minute discussion, and test; (c) introduction, film, film again immediately, and test; (d) introduction, film discussion, film again after 24 hours, and test; (e) introduction, film, class notified about a discussion the next day, discussion the next day, film again, test; (f) introduction, film discussion, and 24 hours later the film again, discussion, and test. They found that (d) method, i.e., introduction, film, discussion, film

again after 24 hours, and test was the most effective treatment.

Another type of introduction used by McNiven (1955) in his study was the perceived usefulness, i.e., telling students before they see the film different dates on which they would be tested over the information in the film. Subjects were 473 high school students and the topics taught by film were First-aid, Atomic energy, and Automobile fundamentals. The temporal goal distance varied for the group from the day after the film showing to some time in the next two months. The results showed that the nearer the individual perceives himself to be to the use of information from a film, the greater will be the learning.

However, in a similar study, Greenhill and McNiven (1956) found that there was no significant differences between the learning or attitude means of the temporal goal distance groups.

Pretest

Can pretest of film content increase learning from film? To answer above question Stein (1952) tested 6,034 U.S. Navy recruits at the Great Lakes Naval Training Station. The hypothesis tested was that knowledge of items on which a student was to be tested after seeing a film would increase learning from the film. The author reported significant effects resulting from the pretest in the performance on both the posttest and the retention test. It was also noted that the effectiveness of a pretest depends upon giving students (a) a test identical to the posttest, and (b) immediate knowledge of the students' performance on the pretest.

Gropper and Lumsdaine (1961) found that active response, with correct answer supplied by the lecturer (pretest), resulted in significantly higher achievement scores on both the immediate and delayed

posttest than those scores achieved by a passive group.

However, not all the results of the experiments involving pretest are similar. Related effectiveness of several film variables in modifying attitudes were tested by Scollon, Jr. (1956) using 311 Army quartermaster trainees with the topic of utilization and acceptance of individual combat ration. The result showed that pretesting the film group on their attitude about the subject before they saw the film reduced the effectiveness of the film for changing attitudes.

Since Pressey (1926), it has been demonstrated that regular examinations have positive teaching value. Fields (1971) developed the "Teaching Test" for the film he used in his Psychology course. Using a Latin square format with multiple choice and true-false test items he has demonstrated that students in an introductory Psychology class learn while they are taking a pretest.

Programmed Instruction Text

The idea of applying programmed instruction technique in teaching can be traced back to Sidney Pressey's teaching machine (1920's). However, Ofiesh (1965) indicated that B. F. Skinner's operant conditioning and reinforcement schedule in instructional procedures appearing around 1960 can be cited as the actual beginning of a science of programmed instruction.

The most important contribution of programmed instruction is the concept that instruction should be designed and presented in order to lead to intended outcomes (Morgan, 1969, p. 94).

The difference in sequencing learning steps divides the programmed instruction technique into three different types.

A. Linear. It allows the student to encounter each frame with constructed response in a straight, prearranged order. Skinner developed

this type of programmed instruction method.

B. Branched. Crowder (1960) developed a different sequence of frames in which based on his choice of response on multiple choice items the student either proceeds on or branches back for remedial information. This program allows each learner a different order of proceeding in the programmed instruction text based on the individual's needs.

C. Auto-elucidative. A more recent technique, auto-elucidative, was developed by Pressey and Kinzer (1964). It is different from the branding method since in auto-elucidative method large steps are taken in information presentation followed by several multiple choice items which branch the student toward the proper goal. The auto-elucidative program is claimed to be less boring than either linear or branch programmed instruction because of its capability of presenting large amounts of information to the student before repetition begins.

Jamison, Suppes, and Wells (1974) concluded from their review of alternative instructional media that programmed instruction is generally as effective as traditional instruction and may result in decreasing the time needed to achieve the intended goals.

Reviewing the previous decade of programmed instruction, Morgan (1969) stated that generally, groups learning from well-constructed programmed instruction were at least as good as teacher-taught groups and often had higher average final test scores, a lower variability of student performance, and less time to completion.

Branson, Stone, Hannum, and Rayner (1973) concluded from their review of programmed instruction that programmed instruction texts and adjunct program are doubtlessly effective and efficient, particularly when the student has a definite need for using the information. They

also stated that programmed instruction was most effective in teaching concepts and intellectual skills.

As Wagner (1954) predicted and as Wade (1971) suggested, some of the instructional films of today are produced based on programmed instruction principles. However, there is no evidence of previous research conducted using programmed instruction texts with instructional film, even though some experiments using instructional television were reported (Greenhill, Lottes, & Pagano, 1963; Lane, 1963).

The third experiment of this study will be an initial attempt to find out the effects of programmed instruction text on learning from instructional film.

IV. METHOD

Experiment I

Subjects

The subjects were 83 students of the 8th grade of the Florida State University Developmental Research School. Their average age was 13 and the majority of the students came from middle-class families. About 80% of the population were white; the remaining 20% were black. Their average I.Q. score was at or slightly above 100. Prerequisite subject training was not needed.

Materials

Four types of materials--three films, lists of objectives, introductions, and pretests-- were employed in this study:

Film A: Age of Discovery, produced by McGraw Hill Co., 1957, is black and white and 15 minutes long. This was an animated film with a succession of drawings covering the topic "Why were so many voyages of discovery made at that particular time in history?"

Film B: 1492, Saga of Western Man, Part II, produced by McGraw Hill Co. (Textbook Films), 1965, was a color film 35 minutes in length. Half of the film was animated with pictures and shadows and the other half was dramatized describing the discovery of America in 1492 by Christopher Columbus.

Film C: Jamestown: The First English Settlement in America was the production of EBF in 1958, and 22 minutes long. It was a dramatized

black and white film describing the settlement of the first English colony beside the James River in Virginia between 1607-1619.

The above films were selected based on the content of the text The Story of America by Eibling, King, Harlow and Finkelstein (Laidlaw Brothers Publishers, 1968). The two films, "Age of Discovery" and "1492, Saga of Western Man," cover parts of the content of unit #2 Exploration and Colonization; and the other film "Jamestown: The First English Settlement in America" covers a part of unit #3 Europeans Build Colonies in America. The textbook was used for American History in 8th grade Social Studies classes.

All three films were previewed by the experimenter and the instructors of the experimental classes. Behavioral objectives, an introduction, and multiple choice objective based test items were constructed based on each film's content.

"The Model for Instructional Film Use," previously developed by the author, was used as a frame of reference for this experiment.

Instruments

The test instruments used in this study were of three kinds: a listening comprehension test, immediate posttest and delayed retention tests, and an attitude scale.

The first of these was the Sequential Tests of Educational Progress (STEP): Listening Test by E.T.S., Princeton, New Jersey. The reported reliability of this listening comprehension test is .90 (KR-20) within a single grade. Level 3, Form 3A: Grades 7-9 was used.

The objective based achievement test for each film, already

described, consisted of test items covering each film's content. These three tests were used to measure immediate acquisition and delayed retention.

An attitude scale, Attitude toward any practice EXHIBIT 3-32, Form A. (Shaw & Wright, 1967) was used to measure the students' attitude toward instructional film use in the classroom. This scale was developed by Bues (1934) using the method of equal-appearing intervals. Items were selected from an original pool of 150 items. There are two 37-item forms and Q value ranged from .50 to 2.2 for items in Form A. Remmers (1960) edited these scales, reducing the number of items per scale to 17. Form A of Remmers' edition was applied in this study. Remmers (1960) reported reliability coefficients ranging from .71 to .92, and limited but encouraging evidence concerning validity is also reported.

Experimental Design

A posttest only control group design (Campbell and Stanley, 1963) was used. Subjects were randomly assigned to four treatment groups, i.e., three experimental groups and one control group.

The design was replicated three times for the three films.

Treatment

Treatment of each group was as follows:

T_1 = presentation of behavioral objectives (EO)

T_2 = presentation of introduction (EI)

T_3 = presentation of pretest (EP)

T_4 = no treatment (CO)

The treatment program for the instructional films was arranged so that the experimental groups were counterbalanced, i.e., each experimental group was in a different condition each time. For example,

group A received a list of behavioral objectives for film A, the introduction for film B, and the pretest for film C while group B and group C received them in different order. Therefore, the experimental design was repeated three times.

	EO	EI	EP	CO
Film A:	Group A	Group B	Group C	Group D
Film B:	Group C	Group A	Group B	Group D
Film C:	Group B	Group C	Group A	Group D

Figure 2. Treatment Program.

Independent Variables

The following independent variables were involved in this study: (a) the presentation of behavioral objectives, (b) the presentation of an introduction to the film, and (c) presentation of a pretest.

Three sets of above independent variables were used in the experiment I.

Dependent Variables

Dependent variables for this experiment were (a) performance on the immediate posttest (IP), (b) performance on the delayed retention test (DR), (c) attitudes toward instructional film use for the study of Social Studies (American History), and (d) scores on STEP: Listening test.

Since three films were used in this study, three sets of the above dependent variables were involved.

Procedure

Prior to the experiment, all of the student took STEP: Listening test. The male instructor read aloud the test materials while the students recorded their answers on an answersheet.

One day after the listening test, the students were assigned to homerooms according to their group category. Following the general direction and prior to the film showing (a) students in EO group were given behavioral objectives, (b) students in EI group received introduction, (c) students in EP group took a pretest, and (d) those who assigned to CO group received no treatment.

After each film showing, with one day interval between film showings, students were given an immediate posttest based on the content of the film. After the third film showing (Jamestown) and following the posttest, Remmers' attitude scale was given to the students of all groups. Two weeks following the immediate posttest, an announced delayed retention test was conducted for each film. The delayed retention test was the same as the immediate posttest the students had taken.

The time required to complete the film showing and the following posttest was about 35 minutes for the film "Age of Discovery," 55 minutes for the film "1492, Saga of Western Man," and 40 minutes for the film "Jamestown" respectively. The time needed for the retention test was about five to ten minutes.

Analysis

Three sets of analysis of variance and analysis of covariance, using BMD01V and BMD04V programs, were employed as the statistical treatment for the data obtained from the study. The Newman-Keuls test for differences between means was calculated for the significant effects found by the analysis of variance. All hypotheses were tested with an

alpha level of .05.

The Pearson Product-Moment Correlation Coefficient was computed using BMD02D to estimate the relationship between scores on the listening comprehension test and those on the posttest. A similar calculation was employed for the delayed retention test scores.

The immediate posttest scores were used as a covariate for the analysis of delayed retention test performances.

Data obtained from each film were treated separately, which resulted in three different sets of analyses.

Limitations

Due to the lack of an adequate measuring instrument, the visual literacy level was not considered in this study.

To the degree that students at the Florida State University Developmental Research School are representative of 8th graders in the State of Florida, the results from this study can be generalized to that population.

Experiment II

This experiment was a replication of one of the first experiments using the instructional film "Age of Discovery." All of the methods and procedures were the same as in the previous one except that STEP: Listening test, delayed retention test, and attitude scale were omitted. Only the main treatment effect on the immediate posttest was examined.

Subjects

The subjects were 212 students of the 7th grade of the Elizabeth Cobb Middle School. Their average age was 12.6 years and the majority of the students came from middle-class families. The average I.Q. score of

the students was about 97.

Analysis

Because ten intact classes were used in this experiment, subjects were not randomly assigned to the treatment groups. Instead, subjects were assigned by class to the treatment groups, and to adjust for the effect statistically the data were analyzed by an analysis of covariance, using the computer program BMD04V, with I.Q. score as a covariate. It can be noted that the school system had intentionally randomized students' ability within classes.

Significant alpha level was .05.

Experiment III

Subjects

The subjects for this experiment were 185 male and female 7th grade students of the Elizabeth Cobb Middle School. The class schedules of the subjects prevented the investigator from randomly assigning students to one of three treatment conditions, therefore, students were assigned by class. The classes comprised the teaching load of two teachers.

The school system had intentionally randomized ability within classes so that it can be assumed that a full range of student ability was present in each class.

Average I.Q. score of the subjects was 97 and their average age was 12.5.

There was no need for any prerequisite subject training.

Materials

The materials employed in this experiment were one film, list of objectives, and programmed instruction text.

The title of the film is "Jamestown: The First English Settlement in America." It was produced by EBF in 1958, and 22 minutes long. The film is dramatized black and white describing the settlement of the first English colony in America between 1607-1619. The same film was used in the first experiment previously conducted at the FSU Developmental Research School.

The list of behavioral objectives, also previously used in the first experiment, was reapplied as a variable.

For this experiment a programmed instruction text was developed by the author based on the behavioral objectives. One-to-one and small group formative evaluations were conducted and the results were satisfactory with few changes to be made.

"The Model for Instructional Film Use" was also employed; however, the second film showing in the model was eliminated because of the time factor.

Instrument

A pretest and posttest was used to measure the performance of each subject. It is an objective based achievement test which covers the film content. It was developed previously for the first experiment.

Experimental Design

A 2 x 3 factorial design was applied in this experiment. Based on the pretest score the subjects were divided into either a high prior knowledge group or a low group which allowed two cells for each treatment.

Treatment

Treatment of each group was:

T_1 = presentation of programmed instruction text (ET)

T_2 = presentation of behavioral objectives (EO)

T_3 = no treatment (CO)

To reduce the influence of teacher/treatment confounding, no treatment was administered exclusively to one teacher's students.

All students were told that they were members of an experiment, even though the ideal situation is when the experiment is conducted without subjects' knowledge that they are participating in an experiment (Travers, 1958).

Independent Variables

The Independent variables were (a) behavioral objectives and (b) programmed instruction text.

Dependent Variables

The dependent variable was students' performance on the immediate posttest (IP).

Procedure

Students were assigned by class to one of three treatment groups, i.e., programmed instruction text group, behavioral objectives group, and control group. Each group was divided into two cells based on their scores on the pretest. The treatment procedures were as follows: (a) students in ET group were given a pretest and programmed instruction text one day prior to the film showing, (b) students in EO group received a pretest and behavioral objectives before the film showing (same day), and (c) finally, students in CO group were given a pretest only before the film showing (same day).

After the film showing all of the subjects were given an immediate posttest based on the content of the film. The identical test was used as pretest and posttest.

The time required to complete the pretest, treatment, film showing,

and posttest was about 80 minutes for ET group, 50 minutes for EO group, and 45 minutes for CO group. This experiment was conducted within the regular 50-minute class period which required two class hours for ET group. The time needed for the posttest was 5 to 10 minutes.

Classroom teachers were present only as observers.

Table 2

Sample Sizes for Each Cell

Prior Knowledge	Treatment			Sums
	ET	EO	CO	
HG	35	24	34	93
LG	35	27	30	90
Sums	70	51	64	185

Analysis

Data were analyzed by analysis of covariance using the BMD05V computer program with I.Q. score as a covariate. It can be assumed that I.Q. score of each subject has a significant correlation with the achievement scores on learning from instructional film (Kantor, 1960; Kazam, 1961; Slattery, 1953; Smith, 1952; VanderMeer, 1953; & Vuke, 1962). I.Q. score was used as a covariate in this analysis in order to adjust statistically the possible effect in the experiment.

The Newman-Keuls test for differences between means was calculated for significant treatment effects found by the analysis of covariance. All hypotheses were tested with an alpha level of .05.

Students who were either absent for any one of the tests or treatment, or whose recent I.Q. score (this year's) was not available

were discarded from the study. A total of 14 students were eliminated from the data analysis because of above reasons.

Limitation

American History, which covers the topic "Age of Discovery" and "Jamestown" (Experiment II & III), is taught at the 8th grade level in the school. However, the topics were already covered by the teachers and all of 8th grade students were exposed to the content; therefore, 7th graders were used instead of 8th graders to prevent any influence of prior learning on the study. Therefore, the results can be generalized to that population.

V. RESULTS

The results of this study are presented separately for each experiment.

Experiment I

The dependent variables for this experiment included the number of correct responses for the achievement test measured immediately after each film showing and two weeks later for retention, and the median score of each student on Remmers' attitude scale. The same test was used for the posttest and retention test; therefore, three different tests for three films were used.

Table 3

Dependent Variables

Test	How measured	Maximum Score
Test for Film A: Age of Discovery	Score obtained on 27 item criterion test	27
Test for Film B: 1492, Saga of Westerm Man	Score obtained on 20 item criterion test	20
Test for Film C: Jamestown	Score obtained on 14 item criterion test	14

The KR-20 reliability was computed for all of three posttests and three retention tests (see Table 4).

Table 4

Reliabilities of Posttests

and Retention Tests

Film	Reliability (KR-20)	
	Posttest	Retention Test
Film A: Age of Discovery	.81	.80
Film B: 1492, Sage of Western Man	.73	.70
Film C: Jamestown	.79	.66

Item difficulty and discrimination indices for the tests are presented in Appendix F.

Film A: Age of Discovery

Posttest. For the dependent variable of the achievement test score for the immediate posttest, the treatment effects were not significant (see Table 5).

Table 5

Analysis of Variance for the

Posttest Data: Film A

Source	df	MS	F
Treatment	3	23.3347	.8041
Error	79	29.0196	

There were three experimental groups and one control group. Group means and standard deviations are listed in Table 6.

Table 6

Means and Standard Deviations for

the Posttest Data: Film A

Treatment Group	M	SD
EO	13.952	5.563
EI	13.850	5.314
EP	13.810	5.474
CO	11.762	5.186

Even though all group mean scores of the experimental groups are higher than those of the control group, this could be caused by chance.

Retention Test. An analysis of covariance adjusting the immediate posttest scores showed that there were no significant differences between the EO, EI, EP, and CO groups.. Table 7 presents the results of the analysis.

Table 7

Analysis of Covariance for the

Retention Test Data: Film A

Source	df	MS	F
Treatment	3	26.4907	2.5485
Error	74	10.3947	

The obtained F o 2.548 approaches the critical value of 2.82. Adjusted means, shown in Table 8, plus the F ratio approaching significa .ce, seem to imply that the mean performance of the control group was less than that the mean performance of the experimental groups.

Table 8

Means and Standard Deviations for

the Retention Test Data: Film A

Treatment Group	M^a	SD
EO	14.0383	3.2299
EI	13.7108	3.2354
EP	14.3251	3.2280
CO	11.7326	3.2803

Note. [a] Adjusted means.

Film B: 1492, Saga of Western Man

Posttest. The analysis of variance indicated that the main treatment effect was significant, F (3, 71) = 4.74, p < .01.

Table 9

Analysis of Variance for the

Posttest Data: Film B

Source	df	MS	F
Treatment	3	44.3041	4.7382**
Error	71	9.3505	

Note. **p < .01.

The Newman-Keuls sequential range test, which tests the differences between independent means in order to determine whether means differ significantly, revealed that all participants in the experimental groups performed significantly better than those in the control group on the posttest (see Table 10). However, there were no significant differences between the experimental groups, i.e., EO, EI, and EP.

Table 10

Newman-Keuls Test on Differences Between Means for the Posttest Treatment Effect: Film B

Treatment	Treatment			
	CO	EP	EI	EO
CO	--	4.33**	4.35**	4.57*
EP		--	0.03	0.24
EI			--	0.22
EO				--

Note. *$p < .05$.
**$p < .01$.

The mean scores and standard deviations of the four groups are shown in Table 11.

Table 11

Means and Standard Deviations for

the Posttest Data: Film B

Treatment Group	M	SD
EO	12.500	2.395
EI	12.350	2.777
EP	12.333	3.352
CO	9.368	3.578

Retention Test. An analysis of covariance, with the posttest scores as a covariate, was computed to test the hypothesis related to retention data. As seen in Table 12, there were no significant differences between the EO, EI, EP, and CO groups.

Table 12

Analysis of Covariance for the

Retention Test Data: Film B

Source	df	MS	F
Treatment	3	1.2059	.2638
Error	71	4.5713	

Group means and standard deviations are presented in Table 13.

Table 13

Means and Standard Deviations for

the Retention Test Data: Film B

Treatment Group	M[a]	SD
EO	11.9017	2.1524
EI	11.3943	2.1485
EP	11.9587	2.1524
CO	11.7525	2.3356

Note. [a] Adjusted means.

Film C: Jamestown: The First English Settlement in America

Posttest. There were no significant effects found in the analysis of variance (see Table 14).

Table 14

Analysis of Variance for the

Posttest Data: Film C

Source	df	MS	F
Treatment	3	7.9555	1.1164
Error	75	7.1258	

Table 15 shows the group means and standard deviations of the four groups.

Table 15

Means and Standard Deviations for

the Posttest Data: Film C

Treatment Group	M	SD
EO	7.9000	2.2219
EI	7.7619	2.8619
EP	8.3889	2.2000
CO	6.8500	3.1999

Retention Test. An analysis of covariance adjusting posttest score as a covariate was computed and it was found that there were no significant effects as shown in Table 16.

Table 16

Analysis of Covariance for the

Retention Test Data: Film C.

Source	df	MS	F
Treatment	3	1.6324	.3265
Error	71	4.9996	

Table 17 presents the adjusted means and standard deviations of the retention test.

Table 17

Means and Standard Deviations for the Retention Test Data: Film C

Treatment Group	M[a]	SD
EO	6.9829	2.2410
EI	7.3263	2.2487
EP	7.6827	2.2374
CO	7.3233	2.2828

Note. [a] Adjusted Means.

Listening Comprehension Test

The weighted scores of the subjects on the STEP: Listening Test were computed according to the procedure indicated in the scoring manual. The Pearson Product-Moment correlation between the listening comprehension scores and achievement test scores (posttest & retention test) were computed as shown in Table 18.

The results indicated positive relationships between the listening comprehension scores and the achievement test scores, even though they are not strong positive relationships.

The cross-tabulated plot, computer print-out by the BMD02D, can be referred to in Appendix G.

Table 18

Correlation Between Achievement Test Scores

and Listening Comprehension Scores

Listening Comprehension		Achievement Tests	
		Posttest	Retention Test
Correlation	Film A:	.69	.66
	Film B:	.65	.61
	Film C:	.59	.64

Attitude Scale

The analysis of variance of the attitude scale indicated that there were no significant differences between the attitudes of participants of the experimental groups and those of the control group as shown in Table 19.

Table 19

Analysis of Variance for

Attitude Scale

Source	df	MS	F
Treatment	3	.3928	.2697
Error	74	1.4564	

The median score of each student ranging between 73% to 76% showed a positive attitude toward instructional film use for Social Studies (see

Table 20).

Table 20

Means and Standard Deviations

for Attitude Scale Data

Treatment Group	M	SD
EO	7.4381	.9836
EI	7.3472	1.1559
EP	7.6125	1.5733
CO	7.2868	1.0188

Note. Maximum score = 10.

The attitude scale was measured at the end of Experiment I. Students liked Film B: 1492, Saga of Western Man best, and Film C: Jamestown next.

Posttest/Retention Test Comparision

The results of the posttest and retention test comparision by t-test (SPSS Computer Program) showed that there were no significant differences between those two test scores of each group.

Table 21 shows the summary of t-tests between measures of each group. Though some raw scores of the delayed retention test were higher than those of the posttest, proper interpretation could be that it occured by chance. Further discussion is presented in the next chapter.

Table 21

Summary of t-test Between Measures

on Posttest and Retention Test

Group	t	Group	t	Group	t
Film A:		Film B:		Film C:	
EO	-.74	EO	-.11	EO	1.89
EI	-.10	EI	.73	EI	1.11
EP	-1.26	EP	-.19	EP	.18
CO	1.16	CO	-1.27	CO	.08

Note. Two tail t-test.

Experiment II

The dependent variable for this experiment was the number of correct responses for the achievement test measured immediately after the film showing.

An analysis of covariance, adjusting I.Q. score as a covariate, was incorporated to analyze the data obtained from the posttest to test the hypotheses. There were no significant differences between treatment groups, i.e., EO, EI, EP, and CO.

The results of analysis are presented in Table 22 and group means and standard deviations are shown in Table 23.

In this experiment, the posttest had a KR-20 reliability of .82 and item difficulty and discrimination index are presented in Appendix F.

Film A: Age of Discovery, used in the Experiment I, was reused in this experiment.

Table 22

Analysis of Variance for

Posttest Data

Experiment II

Source	df	MS	F
Treatment	3	12.4710	.8694
Error	207	14.3452	

Table 23

Means and Standard Deviations

for Posttest Data

Experiment II

Treatment Group	M[a]	SD
EO	11.8733	3.8106
EI	11.4762	3.7912
EP	12.1766	3.7907
CO	12.6128	3.8071

Experiment III

The number of correct responses for the achievement test measured immediately after the film showing served as the dependent variable in this experiment.

All participants were pretested with a 14 item achievement test.

Those students who answered five or more correct responses were classified as high prior knowledge group (HG) while those with four or less correct responses were grouped as low prior knowledge (LG). The distinction between the high and low prior knowledge groups was only relevant to statistical manipulations; thus, it did not affect the treatment administration to the students.

The main effects of treatment (ET, EO, & CO), pretest levels of prior knowledge (HG & LG), and their interaction were examined through statistical analyses.

The posttest scores were analyzed using 2 x 3 analysis of covariance with I.Q. score as a covariate by the computer program BMD05V.

For the dependent variable of achievement test scores for the immediate posttesting, the main effect was significant, F (2, 178) = 47.64, $p < .005$.

Table 24

Analysis of Covariance for

Posttest Data

Experiment III

Source	df	MS	F
Treatment (T)	2	216.5276	47.6377***
Prior Knowledge Level (P)	1	86.5573	19.0433**
T x P	2	10.2735	2.2602
Error	178	4.5453	

Note. **$p < .01$.
***$p < .005$.

Inspection of the means using the Newman-Keuls method (Table 25) revealed that students who received the programmed instruction text performed better than both of those who received behavioral objectives (EO) andthose who had no treatment (CO).

Table 25

Newman-Keuls Test on Differences Between Means for the Posttest Treatment Effect Experiment III

Treatment	Treatment		
	EO	CO	ET
EO	--	1.21	10.99**
CO		--	9.78**
ET			--

Note. **$p < .01$.

The differences between the high and low prior knowledge groups was also significant at $p < .01$ level with the high prior knowledge group students performing 18% to 27% better than the low group students(see Table 26).

An examination of the mean score and percent correct in each of the six cells indicated that the greatest difference occured in the behavioral ob .tives group (EO) in which students with high prior knowledge performed 27% better than those of the low group.

The analysis of total test scores on the immediate posttest

showed that the interaction of treatment and prior knowledge level was not significant (see Table 24).

Table 26

Means, Standard Deviations, and Percent Correct

for All Groups on the Posttest

Experiment III

Treatment	Prior Knowledge			
	High Group		Low Group	
	M	SD	M	SD
ET	11.4285 82%	3.0610	9.0286 64%	2.9153
EO	9.2083 66%	2.1665	5.4444 39%	2.8465
CO	8.8529 63%	2.8724	6.0667 43%	2 5989

Analysis of variance and analysis of covariance for three experiments were summarized in Table 27.

Table 27

Summary: Analysis of Variance

and Analysis of Covariance

Experiment	Source	Posttest			Retention Test		
		df	MS	F	df	MS	F
Experiment One:							
Film A	Treatment	3	23.3347	.8041	3	26.4907	2.5485
	Error	79			74		
Film B	Treatment	3	44.3041	4.7382**	3	1.2059	.2638
	Error	71	9.3505		71	4.5713	
Film C	Treatment	3	7.9555	1.1164	3	1.6324	.3265
	Error	75	7.1258		71	4.9996	
Attitude Scale	Treatment	3	.3928	.2697			
	Error	74	1.4564				
Experiment Two:							
Film A	Treatment	3	12.4710	.8694			
	Error	207	14.3452				
Experiment Three:							
Film C	Treatment	2	216.5276	47.6377***			
	Prior Knowledge	1	86.5573	19.0433**			
	T x P	2	10.2735	2.2602			
	Error	178	4.5453				

Note. **$p < .01$.
***$p < .005$.

VI. DISCUSSION

In analyzing the data obtained from three experiments with five sets of dependent variables, eleven hypotheses were examined.

The present study was designed to investigate the effects of presentation of behavioral objectives, introduction to a film, and pretest, by examining students' scores on posttests and retention tests. The study also attempted to determine whether presentation of the programmed instruction text and behavioral objectives prior to the showing of the film would reveal a facilitative effect on students' performance on the posttest.

Among the results obtained from three films in the first experiment, only the one with Film B (1492, Saga of Western Man) supported the findings of previous studies, which indicated the significant effect of presenting behavioral objectives on learning from instructional films (Keutor, 1970; Smith, Roberts, & Taylor, 1973; and VanderMeer & Cogswell, 1952). Use of an introduction and a pretest also revealed significant facilitative effects on the students' learning. These findings are consistent with previous studies concerning introductions (Allen, 1955; Allison & Ash, 1951; Fullerton, 1956; McNiven, 1955; Murphy, 1960; and Northrop, 1952) and studies concerning pretest (Fields, 1971; Gropper & Lumsdaine, 1961; and Stein, 1952). All students in the experimental groups performed significantly better than those of the control group; however, there were no significant differences between the means of the experimental groups (EO, EI, & EP). Thus the results obtained from Film B indicated that

presentation of behavioral objectives, an introduction, or a pretest prior to showing of the film resulted in better performance of the students. Further, these three variables were equally effective.

The above findings supported the parts of the first through the third hypotheses concerning acquisition on the posttest, i.e., acquisition will be greater under EO, EI, and EP presentation conditions than under the CO conditions. The parts of the hypotheses related to retention were not supported. Also hypothesis four, which stated that acquisition and retention will not differ among EO, EI, and EP presentation conditions was supported

Contrary to those findings obtained from the posttest on Film B, the posttest results of Film A and Film C showed no significant differences between the experimental groups and the control group. There were also no significant differences between groups on retention tests.

The total results of the first experiment could be interpreted in the following manner: The effects of the variables (behavioral objectives, introduction, & pretest) on learning from instructional films vary according to different films. Comparision of the results obtained with the three films used in this study is not appropriate, as the films differ in content as well as construction type, style, and length.

As Duchastel and Merrill (1973) indicated, the results of the research on behavioral objectives are inconsistent and the same tendencies are shown on the results of this experiment on instruction and pretest.

One of the major hypotheses of the study was that the immediate posttest scores will exceed the delayed retention scores under all conditions. The hypothesis was not supported by the results obtained in this study. One possible explanation for finding no significant differences

between students' acquisition on the posttests and the delayed retention tests could be that some students were exposed to the contents of the three films in their textbook between the posttests and the retention tests. The 8th grade history classes were individualized by a contract between each student and the teacher, which allowed the student to study the textbook in different orders, according to preference and the contract: Although the experiments were schduled to be conducted before the students were exposed to the contents of each film in the textbook, due to the individualization, exposure to the related contents may have proceeded the experiments.

Another reason for finding no significant differences between measures on the posttest and delayed retention test could be supplied by Frase (1970). He found that difficult items take a longer period of time to be properly encoded into the existing cognitive structure; therefore, the more difficult items become more readily available after a delayed interval of time. The mean scores of the students on both posttests and retention tests showed low acquisition (between 50% to 65%), which can be an indication of the difficulty of the tests.

The sixth hypothesis in this study questioned whether there was a positive relationship between a student's performance on posttests and retention tests and his score on the listening comprehension test. A mild positive relationship between the listening test and the student scores on the posttests and retention tests was found, supporting this hypothesis.

The hypothesis that the students under EO, EI, and EP presentation conditions would show more positive attitudes toward the use of instructional films in the Social Studies classes than those under CO condition

was not supported. Instead, there were no significant differences among students in the four groups. Regardless of their group category, the students showed similar favorable attitudes (73% to 79% agreement) toward the use of instructional films in Social studies classes. In selecting the film they liked best, most of the students chose Film B (1492, Saga of Western Man) showing a preference for the color film.

The results of the second experiment were not significant and the hypothesis which stated that acquisition would be greater under EO, EI, and EP condition in comparision to the CO condition was rejected. This experiment was a replication of the first experiment, using the same Film A (Age of Discovery).

One of the purposes of this study was to investigate the unexplored area of the effects of programmed instruction text on learning American history from instructional films. It was found that the programmed instruction text used had facilitative effects upon students' performance on the posttest. Students of the ET group performed significantly better than those of the CO group' thus, hypothesis eight was supported.

The ninth hypothesis, that acquisition will not differ between ET and EO presentation conditions, was not supported; rather, the results showed that the scores of the EO group were similar to those of the CO group, while students in the ET group performed significantly better than either the EO or CO group.

Another finding of this study was that students with higher prior knowledge performed significantly better than those of the low prior knowledge group. Therefore, hypothesis ten, which stated that there would be no differences between those two groups, was not supported.

The interaction effect was not significant on the posttest data.

The results indicated that there was no treatment/aptitude interaction among the performances of the students of all three groups.

The present study showed that a linear programmed instruction text can be successfully applied to learning from instructional films. However, the effects of the three variables, i.e., behavioral objectives, introduction, and pretest varied according to the different films, indicating the need for further studies in this area.

One benefit of using programmed instruction texts would be that once properly developed in relation to a specific film's contents and tested in the classroom situation, the programmed text could be stored with the film for later use. Therefore, the time and efforts required to produce a programmed instruction text could be justified when the film is used continuously.

The Model for Instructional Film Use which was applied as a framework for this study showed a potential for application in the classroom situation, providing flexibility to the user. Each step of the model can be expanded or compressed according to the need of each user or classroom.

Further research is needed in the area of this present study in relation to generalizability of results to different populations. In the second and the third experiments, 7th graders were used as subjects because 8th grade students were already exposed to the contents of the films. Thus, replications of these experiments should be carried out, using the target population--8th graders, as well as using comparable materials at various grade levels to determine the range of grade levels to which the results may be generalized.

Another area in need of investigation is the application of the variables applied in this study to different subject areas and with

students of various ability levels. In addition, other characteristics of the students, such as social economic levels, sex differences, and cultural differences should be investigated in relation to instructional films and the variables under consideration.

Also, studies comparing the effects of the variable programmed instruction text with either the variable introduction or the variable pretest are recommended.

Finally, there should be an attempt to determine the effects of listening comprehension in relation to learning from instructional films and learning from regular classroom lectures. Much research has been devoted to readability effects; however, effects of listening ability of the students on performance has received little attention.

In conclusion, there should be further attempts to determine more effective methods of using the existing instructional films, which include a rich library of experimental films developed over past decades.

Summary

In conducting the three previously described experiments, the four variables--behavioral objectives, introduction, pretest, and programmed instruction text-- were investigated.

In the first experiment, it was found that the effectiveness of behavioral objectives, introduction, and pretest vary according to the specific film. The results of the Film B revealed significant effects of the above variables on the posttest. However, posttest data of Film A and Film C showed no significant differences between all four groups. The results of the retention test were not significant for all films.

There were no differences between the immediate posttest scores and those of the delayed retention test with any of three films.

Also, attitudes among students in all groups (EO, EI, EP, & CO) did not differ significantly, showing positive attitudes (73% to 79%) toward the use of instructional films in Social Studies classes.

Inspection of listening comprehension scores of the students and their performance on the posttests and the retention tests indicated positive relationships.

The results of the second experiment were not significant and there were no differences between performances of the EO, EI, EP, and CO groups.

An established programmed instruction text was applied in the third experiment, revealing significant effects on learning from the Film C. However, the effects of behavioral objectives were not significant.

Another finding was that students with high prior knowledge performed better than those of low prior knowledge. But, there were no treatment/aptitude interactions among all students, regardeless of their group category.

APPENDIXES

APPENDIX A

BEHAVIORAL OBJECTIVES FOR FILMS

Directions

Good Morning! You are going to watch an instructional film, "Age of Discovery." Read the following objectives and watch the film very carefully. You will be given a test over the information after you have finished watching this film.

OBJECTIVES

The student will be able to identify:

1. the parts of the world that were unknown a thousand years ago.
2. the name of the person(s) who governed Spain during the Age of Discovery.
3. what life during the Age of Discovery centered around.
4. the amount of schooling and travel that went on during this period.
5. the religious pilgrimage that occured between 1096 and 1270.
6. what were brought back from the Holy Land.
7. the sea through which the people had to sail in order to trade with the East.
8. the cities which were famous for trade between the East and the West.
9. how the goods for trade were transported.
10. the correct meaning of the word Renaissance.
11. the causes of the Renaissance.
12. the manner in which the Renaissance people lived.
13. the results of trade monopolies.
14. the people who charged high tolls to caravans passing through their land.
15. the results of the invention of the printing press.
16. how the sailors regarded the Atlantic Ocean.

The student will be able to identify:

17. the person who initiated the exploration of the Atlantic Ocean.

18. the aids which helped accomplish the discovery and exploration of the new world.

19. the characteristics a man needs to become an explorer.

20. what land Columbus mistook the island of San Salvador for.

21. how many voyages by the new route Columbus made to the new world.

22. the person who reached India by sailing around the Cape of Good Hope.

23. the person who first reached North America.

24. the person who America was named after.

25. who proved that the world was round.

26. the conditions which characterize the period of history known as the Age of Discovery.

27. modern events that meet the characteristics necessary to be considered as an Age of Discovery.

Directions

Good Morning! You are going to watch an instructional film, "1492, Saga of Western Man." Watch the film very carefully. You will be given a test over the information after you have finished watching this film.

OBJECTIVES

The student will be able to identify:

1. the year that Columbus discovered America.
2. the reason(s) why Columbus went to Spain.
3. the value that was placed upon schooling during this time period.
4. what type of man helps create a nation or united land.
5. what type of political force an individual was considered as during the time of Columbus.
6. how many years Columbus had to wait for the Queen's decision to back his explorations.
7. what type of man Columbus was before discovered America.
8. which direction Columbus thought he would need to sail to reach India.
9. What people the new sea route to India would avoid.
10. how many people believed Columbus' idea that the world was round.
11. which rulers Columbus wrote to about his idea of a new route to India.
12. who the residents of Spain were after it turned into a modern type of nation.

The student will be able to identify:

13. what country Queen Isabella and King Ferdinand ruled.

14. how Columbus spent his time while waiting for money to back his explorations.

15. the reasons why the people called the Atlantic Ocean the "Dark Sea."

16. the reasons why Queen Isabella hesitated to support Columbus' explorations.

17. the reasons why Queen Isabella decided to give Columbus the money he needed.

18. how many ships Columbus had on his first voyage.

19. what land Columbus thought he had reached when he discovered America.

20. the results of the discovery of Columbus.

Directions

Good Morning! You are going to watch an instructional film, "Jamestown." Watch the film very carefully. You will be given a test over the information after you have finished watching this film.

OBJECTIVES

The student will be able to identify:

1. the common purposes of the first Jamestown colony.
2. who Jamestown was named after.
3. the causes of the failure the first colony had faced.
4. the name of the first governor of Jamestown.
5. the first rule of the rebuilt Jamestown.
6. the reason that the colony settled along the river.
7. the kind of trade which took place between the colony and the Indians.
8. the name of the Indian princess.
9. the items traded between the colony and the Indians.
10. the person who brought success to the colony by planting tobacco.
11. the meanings associated with the name Rebecca.
12. the sex of the residents of Jamestown in the beginning of the colony.
13. the organization which was established in 1619 to govern Jamestown.
14. conditions needed for a colony to be successful.

APPENDIX B

INTRODUCTIONS TO FILMS

Directions

Good Morning! You are going to watch an instructional film, "Age of Discovery." Read the following introduction and watch the film very carefully. You will be given a test over the information after you have finished watching this film.

INTRODUCTION

The purpose of this film is to learn about the specific period of history known as the Age of Discovery. Great pilgrimages between the East and the West started an exchange of ideas, cultures, and goods. This was also a time of discovery and exploration of new World. These famous explorers, new inventions, and newly discovered places are described.

A period called the Renaissance brought about a renewed interest in learning, art, and culture. The life of the people during this period is discussed.

Finally, the factors that encouraged man to discover and explore the new world are presented; factors that are just as important in modern times as they were in historic periods.

Directions

Good Morning! You are going to watch an instructional film, "1492, Saga of Western Man." Watch the film very carefully. You will be given a test over the information after you have finished watching this film.

INTRODUCTION

This film tells the story of Columbus, from the time he went to Spain to get support for his explorations, until he discovered America. Columbus first traveled to Spain, where he spent a period of time waiting for Queen Isabella to give him support to back his explorations. What he did during this time and how he finally got the support is described in this film. The people of this historic period, their characteristics, and thoughts are also presented. In 1492 Columbus set sail to discover a new route to India. His long, dangerous voyage across the Atlantic Ocean and the glorious day when Columbus and his sailors reached land is portrayed. It is a saga of a western man's vision, courage, patience, and hope.

Directions

Good Morning! You are going to watch an instructional film, "Jamestown." Watch the film very carefully. You will be given a test over the information after you have finished watching this film.

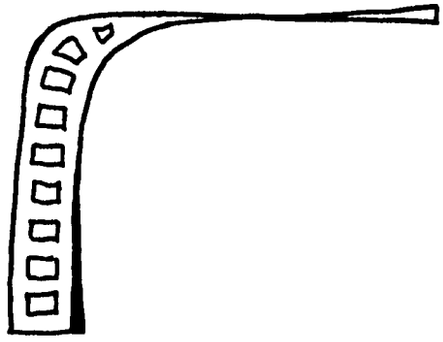
INTRODUCTION

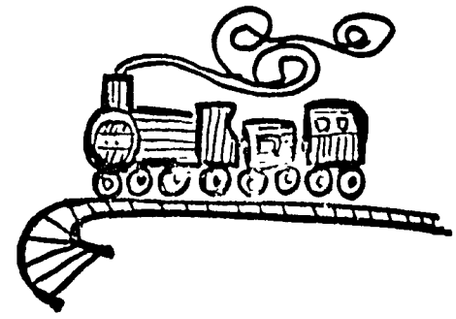
The purpose of this film is to learn the facts about Jamestown, the first English settlement in America (1607-1619). The colony had faced many difficulties including illness, lack of food, and fire. They failed to provide some profits to the Virginia Company by whom they were sent, nor did they find better land and quick wealth. Right when the survivors were about to give up, supplies and help came from the Virginia Company. A strong leader also came to guide the colony. The colonists then rebuilt Jamestown, began to trade with the Indians, and to produce Virginia tobacco. Their tobacco brought wealth and success to the colony. New communities sprang up along the James River and in 1619 the colony became self-governing under the Burgesses system.

APPENDIX C

PROGRAMMED INSTRUCTION TEXT

It should be noted that student's booklet
contains only one frame and one answer on each page.
For convenience, two student's booklet pages
have been combined into one page
in this copy.





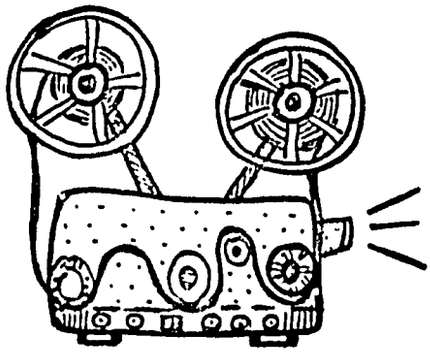
A Programmed Text

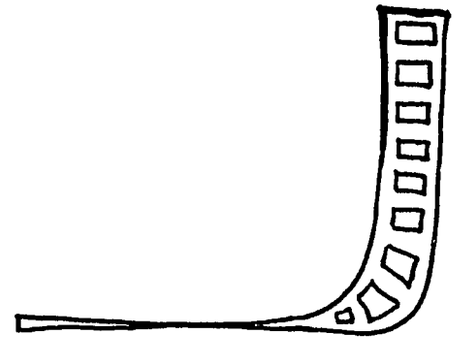
for

An Instructional Film

Jamestown: The First English

Settlement in America



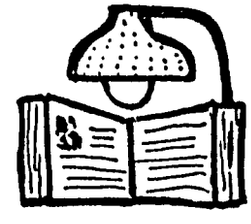


by

Yoo Jae Song

January 1975

This is a programmed text in which you are going to learn the facts about Jamestown between 1607 and 1619. Please read carefully and answer each question.



My name is John Rolfe. I am the secretary of this colony, Jamestown. Have you ever heard about Jamestown: the first English settlement in America? Well, then I'll tell you the story.

* * * * * * * * * * *

Frame #1.

A long time ago(1607) we sailed a ship owned by the Virginia Company to this new land. We left our homeland for a better land, to bring profits to the Company, and to search for quick wealth for ourselves.

Now, can you tell me what were the common purposes of the first Jamestown colony? Please write your answer.

_____

_____

_____

Answer: You are right if you listed as follows:

A. Search for better land
B. Bring profits to the Virginia Company
C. Gain quick wealth

* * * * * * * * * * *

Frame #2.

We settled by the James River and named our town Jamestown after our King, James, of England.

Jamestown was named after the _____.

Answer: The King of England

* * * * * * * * *

Frame #3.

In the beginning all of the colonists were men. It took a while before the colony could bring some women from England.

In the beginning the settlers of Jamestown were all _____.

Answer: Men. What a discrimination! Isn't it?

* * * * * * * * *

Frame #4.

Spain had found gold in this new land, therefore, we searched for gold, too. It was in vain. Difficulties followed: years of hunger and dissension. The colonists suffered from unknown illnesses, lack of food, and fearsome Indians. The lack of government and leadership contributed to the failure. To worsen the situation, a big fire burned most of Jamestown.

The original colony failed because of:

_____, _____, _____, & _____.

Answer: A. Lack of food B. Unknown illness C. Fear of Indians
D. Lack of government or leadership.

* * * * * * * * * * *

Frame #5.

We were abandoned; beyond hope, beyond work, and beyond government. By the decision made in a group meeting we started back to England. However, it was not the will of God that we should abandon Jamestown.

Lord Delaware came with supplies to rebuild Jamestown. He became the first governor of our colony.

Do you remember the name of the first governor of Jamestown?

_____

Answer: Lord DeLaware

* * * * * * * * * * *

Frame #6.

Do you follow my story up to now?

O.K. Let's check.

Can you tell me what were the common purposes of the first Jamestown colony?

_____

Answer: Right! They are: Search for better land
Bring profits to the Virginia Company
Gain quick wealth

If you didn't remember, please read the answer one more time.

* * * * * * * * * * *

Frame #7.

Why did the original colony fail?

Because of _____

_____

_____

_____

Answer: Lack of food, unknown illnesses, fear of Indians, and lack of leadership.

* * * * * * * * * * *

Frame #8.

The colony named their town _____ after their King in England.

Answer: Jamestown - well, it is an easy question.

* * * * * * * * * * *

Frame #9.

Hmm? No, Jenifer. Lord Delaware was not the secretary of the colony. He was the _____.

Answer: First governor in Jamestown.

* * * * * * * * * * *

Frame #10.

Our first governor said ".....Let all men hear what I say. From now on every one will know that in order to eat, he must work." Under his leadership we rebuilt Jamestown.

Can you guess what was the first rule of the rebuilt Jamestown?

_____ to _____.

Answer: Yes, work to eat!

* * * * * * * * * * *

Frame #11.

As more settlers arrived from England, the communities spread along the James River. Like savages, we came to the water's edge for better transportation and ease of supply.

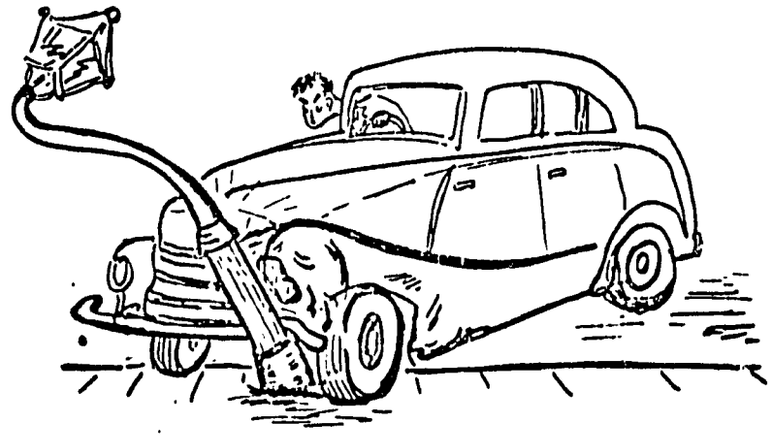
The colony settled along the river for:

_____ and _____.

Answer: Better transportation and ease of supply..

* * * * * * * * * * *

Let's stop for a 5 seconds break. If we rush, sometimes we might end up like this!



Let me continue my story.

Frame #12.

Indians were eager to trade things they could not produce themselves. From this first timid contact, gradually barter developed.

The type of trade conducted between the colonists and the Indians is called _____

Answer: That's right. Barter.

It's not hard to remember, is it?

* * * * * * * * * * *

Frame #13.

Indians brought furs, seeds, plants and herbs. They traded these for tools which they could not produce themselves.

Please name what the Indians and the colonists traded.

_____

Answer: Furs, seeds, plants, herbs, and tools.

* * * * * * * * * * *

Frame #14.

Do you still remember what rule the first governor gave the colonists?

_____

Answer: Yes. In order to eat, one must work.

* * * * * * * * * * *

Frame #15.

Where did the colonists settle and why ?

_____

_____

Answer: A. Along the River
B. For better transportation and ease of supply

* * * * * * * * * * *

Frame #16.

Barter was the type of trade between the _____ and the _____.

Answer: Colonists & Indians

* * * * * * * * * * *

Frame #17.

The colony was still not able to sustain herself without some help from London. About this time I began to take interest in Indian tobacco and it was the time when the Indian princess, Pocahontas, came into my life. She was the daughter of Indian chief Powhatan. She came willingly to stay with the colonists. It can be said that she was a symbol of peace between the colonists and the Indians.

Who was Pocahontas?

_____

Answer: The Indian princess, the daughter of Powhatan.

* * * * * * * * * * *

Frame #18.

Pocahontas married me, and was given a Christian name Rebecca.

The Indian princess had two names. Can you tell me what they are?

_____ & _____.

Answer: They are Pocahontas and Rebecca.
You are doing fine!

* * * * * * * * * * *

Frame #19.

What did the Indians and the colonists trade?

_____

Answer: Furs, seeds, plants, herbs, and tools.

Did you answer correctly?

* * * * * * * * * * *

Frame #20.

Our colony gave me the credit for raising tobacco which brought success to us. Therefore, tobacco became our money crop.

By the way, do you still remember my name?

My name is _____.

Answer: John Rolfe

* * * * * * * * * * *

Frame #21.

Who brought success to the colony by raising tobacco?

_____

Answer: Who....me? Thanks!

* * * * * * * * * * *

Frame #22.

I undertook a voyage to London with my good wife Rebecca in 1617. My happy moment of success was quickly saddened by Rebecca's sudden illness. It was God's will that she never see her native Virginia again.

The needs of our government became more urgent as the Jamestown colony got bigger and bigger. In 1619, the London Company (new name of Virginia Company) granted us the right to elect our own representatives by the male settlers. At last we got our first general assembly in Jamestown -- the House of Burgesses.

Who governed Jamestown in 1619? _____

Answer: The House of Burgesses

* * * * * * * * * * *

Frame #23.

Who governed Jamestown in 1619, the King's governor, the representative of the London Company, or the House of Burgesses ?

_____

Answer: The House of Burgesses

* * * * * * * * * * *

Frame #24.

With leadership, supplies, and resources (tobacco) we had changed the misery to hope of prosperous life, and from argument and dissension to our own government - the House of Burgesses.

From my own experience I can tell that to be successful any colony would need leadership, supplies, and resources.

Please list the conditions to become a successful colony.

_____

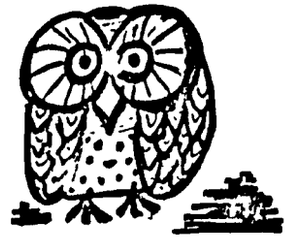
Answer: A. Leader or leadership
B. Supplies
C. Resources

* * * * * * * * * * *

Thank you for listening to my old story. I know exactly how you feel now. Go to the next page and find out how good my guess is.

You feel like you've read all of those books in this picture. Right?

I hope you will enjoy the instructional film Jamestown: The First English settlement in America. So long until I meet you on the screen!



APPENDIX D

ACHIEVEMENT TESTS

Age of Discovery

Directions

Please write your name on the answer sheet and mark the correct answers.

1. Which parts of the world were unknown a thousand ago?

   A. Europe, America, and much of Asia
   *B. America, Australia, and much of Asia and Africa
   C. Australia, Europe, and much of Asia and Africa
   D. Asia, America, and much of Europe and Africa

2. Who governed Spain during the Age of Discovery?

   A. Queen Isabella
   B. King Ferdinand
   *C. Both of the above
   D. None of the above

3. The Age of Discovery was a period when life centered around the:

   *A. castles of the Lords
   B. lands of the Kings
   C. towns of business
   D. cities of trade

4. Which of the following describes school and travel during this time period?

   A. much school learning and much travel
   *B. little school learning and a little travel
   C. much school learning and a little travel
   D. little school learning and much travel

5. The great religious pilgrimage between 1096 and 1270 was called the:

   A. Pilgrims
   *B. Crusade
   C. Holy Battle
   D. Cross War

6. The people who went on a pilgrimage to the Holy Land returned to Europe with:

   A. new idea
   B. new culture
   C. new spices
   *D. all of the above

7. To trade with the East, the people sailed through the:

   A. Dark Sea
   *B. Mediterranean Sea
   C. Atlantic Ocean
   D. Pacific Ocean

8. Which city(cities) was(were) famous for trade between the East and the West?

   A. Venice
   B. Genoa
   *C. Both of the above
   D. None of the above

9. What means were used to transport the goods used for trade?

   *A. land caravans and ships
   B. ships and boats
   C. boats and steamers
   D. horses and camels

10. The word Renaissance means:

    A. an interest in arts and wealth
    *B. the rebirth of interest in culture and learning
    C. the rebirth of interest in trading and new world
    D. none of the above

11. What caused the Renaissance?

    A. the trade with East
    B. the exchange of ideas and culture
    C. the Holy War
    *D. all of the above

12. People in the Renaissance period lived in a very:

*A. luxurious way
B. modern way
C. humble way
D. economic way

13. Trade monopolies produced:

A. high prices
B. discontent of the customers
C. merchant power
*D. all of the above

14. Who charged high tolls to travelers passing through their land?

A. Chinese
B. Italian
*C. Turks
D. Portuguese

15. The newly invented printing press brought:

*A. speed in communication
B. wealth to the merchants
C. a monopoly to the Italians
D. none of the above

16. The sailors regarded the Atlantic Ocean as a(an):

A. dangerous ocean
B. unknown ocean
C. dark sea
*D. all of the above

17. Who initiated the exploration of the Atlantic Ocean?

A. Queen Isabella
*B. Prince Henry
C. King Ferdinand
D. King of France

18. Discovery and exploration of the new world was accomplished by using:

A. magnetic compasses
B. astrolabes
*C. both of the above
D. none of the above

19. To become an explorer a man must have:

A. courage
B. vision
*C. both of the above
D. none of the above

20. At his first trip to the new world, Columbus landed on the island of San Salvador and mistook it for:

*A. India
B. North America
C. Africa
D. Asia

21. How many voyages did Columbus make to the new world?

A. two
B. three
*C. four
D. five

22. Who reached India by sailing around the Cape of Good Hope?

A. Columbus
*B. Vasco da Gama
C. Americus
D. Magellan

23. Who first reached North America?

A. Columbus
B. Vasco da Gama
*C. John Cabot
D. Americus Vespucius

24. America was named after:

A. Columbus because he found it first
*B. Vespucius because he wrote about his exploration
C. the historian who drawn the map of America
D. the Indians who lived America

25. The fact that world is round was proved by:

*A. Columbus
B. John Cabot
C. Americus
D. Da Gama

26. The condition(s) which characterize the period of history known as the Age of Discovery is(are):

A. driving needs
B. tools to work with
C. people with courage and vision
*D. all of the above

27. Which of the following modern event(s) meet(s) the characteristics necessary to be considered as an Age of Discovery?

A. space exploration
B. science research
C. human relations research
*D. all of the above

1492, Saga of Western Man

1. Columbus discovered America in:

   A. 1491
   *B. 1492
   C. 1493
   D. 1494

2. Columbus went to Spain to:

   A. study at the University of the Saramanca
   *B. find supports for his explorations
   C. study at the sea captin's institute
   D. become a noble man with great wealth

3. At this time school was:

   A. very important
   B. important
   *C. not important
   D. none of the above

4. A nation, or united land, is the creation of a:

   *A. strong man
   B. noble man
   C. both of the above
   D. none of the above

5. During the time of Columbus, an individual was considered as:

   A. a political force
   *B. not a political force
   C. partly a political force
   D. none of the above

6. Columbus had been waiting for the Queen's decision to back his explorations for:

   A. five years
   B. six years
   *C. seven years
   D. eight years

7. Before Columbus discovered America he was a:

   *A. seaman
   B. serf
   C. lord
   D. nobleman

8. Columbus believed that he could reach India by sailing:

A. East
*B. West
C. South
D. North

9. A new sea route to India would avoid:

A. the Turks
B. the Moors
*C. both of the above
D. none of the above

10. Columbus' idea that the world was round was believed by:

A. many people
B. some people
*C. few people
D. nobody

11. Columbus wrote about his idea of a new route to India to the:

A. King of France
B. Queen of Spain
C. King of Spain
*D. all of the above

12. After Spain turned into a modern nation the residents of it were:

A. Spanish Christians
B. Spanish Jews
C. Spanish Moors
*D. all of the above

13. Queen Isabella and King Ferdinand ruled:

A. Portugal
B. Italy
*C. Spain
D. France

14. While he was waiting for Queen's decision Columbus:

A. studied
B. read many books
C. thought
*D. all of the above

15. People call Atlantic Ocean the "Dark Sea" because:

    A. it was unknown.
    B. it had dangerous currents
    C. it was very broad
    *D. all of the above

16. Queen Isabella hesitated to support Columbus' exploration at first because:

    A. his idea was too uncertain
    B. scholars didn't agree with him
    C. Spain was preoccupied with war
    *D. all of the above

17. Finally Queen Isabella gave Columbus the money he needed because:

    A. so little would be lost if he failed
    B. so much would be gained if he succeeded
    *C. both of the above
    D. all of the above

18. How many ships did Columbus have at his first voyage?

    A. two
    *B. three
    C. four
    D. five

19. When Columbus discovered America, he thought he had reached:

    *A. India
    B. China
    C. Japan
    D. Spain

20. The discovery of Columbus:

    *A. opened up a new world
    B. brought meaningful life
    C. challenged many Kings
    D. brought power to Italy

Jamestown: The First English Settlement in America

1. What was(were) the common purpose(s) of the first Jamestown colony?

   A. Search for better land
   B. Bring profits to the Virginia Company
   C. Gain quick wealth
   *D. All of the above

2. Jamestown was named after the:

   A. James River
   *B. King of England
   C. first leader of the colony
   D. ship the colonists sailed in

3. The original colony failed because of all of the following problems EXCEPT:

   A. Lack of food
   B. Unknown illness
   *C. Lack of land
   D. Lack of leadership

4. The first governor of Jamestown was:

   A. John Smith
   B. The King of England
   C. John Rolfe
   *D. Lord Delaware

5. The first rule(s) of the rebuilt Jamestown was(were) to:

   A. trade with the Indians
   B. grow tobacco
   *C. work to eat
   D. all of the above

6. The colony settled along the river for:

   *A. better transportation
   B. better farming
   C. both of A and B
   D. neither A nor B

7. The type of trade conducted between the colony and the Indians is called:

   A. business
   *B. barter
   C. sales
   D. marketing

8. The Indian princess who married John Rolfe was:

A. Powhatan
*B. Pocahontas
C. Virginia
D. Bukki

9. The Indians and colonists traded:

*A. furs, seeds, plants and tools
B. furs plants, rifles and guns
C. seeds, tobacco, silk and satin
D. seeds, tobacco, and fishing boats

10. Who brought success to the colony by raising tobacco?

A. the Virginia Company
B. Powhatan
*C. John Rolfe
D. None of the above

11. Rebecca was the:

A. daughter of an Indian chief
B. English name for Pocahontas
C. wife of John Rolfe
*D. all of the above

12. In the beginning the settlers of Jamestown were:

*A. men only
B. men and women
C. men, women, and children
D. men, women, and slaves

13. Who governed Jamestown in 1619?

A. The king's governor
B. The representative of the Virginia Company
*C. The house of Burgesses
D. The secretary of the Colony

14. To be successful, any colony would need:

*A. leaders, supplies, and resources
B. leaders, goods, and Indians
C. supplies, resources, and goods
D. supplies, Indians, and resources

APPENDIX E

ATTITUDE SCALE

Scale for Measuring
Attitude Toward Any Practice
EXHIBIT 3-32, Form A*

Please write your name.

_____
Last First Middle

Directions: Following is a list of statements about instructional films for Social Studies. Place a plus sign (+) before each statement which you agree with. Your score will in no way affect your grade in any course.

Instructional Film for Social Studies:

___ 1. serves a good purpose.

___ 2. has several undesirable features.

___ 3. I like this practice too well to give it up.

___ 4. accomplishes nothing worth while either for the individual or society.

___ 5. develops co-operation.

___ 6. has an irresistible attraction for me.

___ 7. isn't so bad but it is very boring.

___ 8. There is no reason for stopping this practice.

___ 9. is all right in a few cases.

___ 10. is the worst thing I know.

___ 11. should be appreciated by more people.

___ 12. is a waste of time and money.

___ 13. my likes and dislikes for this practice are balanced.

___ 14. Life would be happier without this practice.

___ 15. I dislike this practice but I do not object to others liking it.

___ 16. should not be tolerated when there are so many better ones.

___ 17. has advantages.

Please check the film you like best: Age of Discovery ( )
1492, Saga of Western Man ( )
Jamestown ( )

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APPENDIX F

ITEM DIFFICULTY AND DISCRIMINATION ANALYSIS FOR POSTTESTS AND RETENTION TESTS

* ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
19	.783	20	.639
14	.771	26	.537
6	.735	18	.534
18	.687	21	.534
20	.651	8	.529
5	.627	7	.506
22	.566	24	.500
23	.566	27	.490
26	.554	1	.472
7	.542	19	.466
9	.518	13	.462
27	.506	9	.439
4	.494	10	.429
24	.494	12	.420
21	.482	3	.413
1	.470	22	.400
10	.434	5	.398
3	.410	25	.390
11	.386	11	.364
12	.386	4	.360
2	.361	2	.334
13	.349	16	.332
8	.337	6	.329
16	.325	23	.285
15	.325	14	.221
17	.277	17	.166
25	.277	15	.090

POSTTEST

Age of Discovery

EXPERIMENT I

* * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX * *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
13	.950	12	.639
1	.925	7	.593
19	.912	18	.562
20	.875	11	.556
8	.862	17	.552
18	.850	14	.506
2	.825	20	.486
7	.813	8	.485
14	.675	19	.459
10	.625	15	.440
17	.525	16	.420
12	.500	1	.366
3	.475	2	.339
11	.462	10	.336
15	.462	13	.313
16	.350	6	.289
6	.175	4	.252
9	.137	5	.196
5	.137	3	.141
4	.137	9	.107

POSTTEST

1492, Saga of Western Man

EXPERIMENT I

* * * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
8	.886	11	.597
10	.785	14	.571
14	.747	1	.559
3	.646	9	.531
2	.595	4	.527
1	.544	8	.470
9	.544	5	.439
7	.506	7	.416
5	.481	2	.375
11	.456	13	.371
6	.443	10	.337
4	.380	3	.317
12	.367	12	.103
13	.329	6	.079

POSTTEST

Jamestown: The First
English Settlement in America

EXPERIMENT I

* * * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
19	.872	2	.612
14	.795	24	.600
20	.692	8	.583
6	.654	18	.582
18	.603	3	.577
26	.603	20	.540
16	.590	9	.507
23	.577	7	.475
2	.577	26	.469
27	.551	13	.433
22	.538	11	.431
15	.526	27	.424
1	.513	16	.417
5	.487	22	.400
24	.487	12	.381
9	.474	19	.381
13	.449	10	.377
10	.449	4	.370
11	.436	5	.348
8	.423	6	.345
21	.410	14	.288
7	.385	15	.286
12	.372	17	.219
4	.359	23	.213
3	.321	21	.198
25	.218	1	.137
17	.090	25	.057

RETENTION TEST

Age of Discovery

EXPERIMENT I

* * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
19	.924	16	.668
18	.886	15	.588
20	.861	14	.561
1	.848	17	.553
13	.835	7	.512
7	.797	12	.482
14	.759	11	.450
2	.759	2	.402
8	.709	20	.396
10	.633	18	.385
17	.595	13	.355
3	.570	19	.348
15	.494	3	.278
12	.468	1	.268
11	.430	9	.268
16	.380	6	.251
9	.316	10	.218
6	.316	5	.207
5	.165	4	.101
4	.089	8	.046

RETENTION TEST

1492, Saga of Western Man

EXPERIMENT I

* * * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX *

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
8	.813	14	.607
14	.762	10	.584
3	.737	8	.549
10	.725	11	.513
7	.575	2	.481
5	.525	9	.418
1	.512	5	.417
9	.512	7	.414
12	.462	1	.391
11	.438	3	.388
2	.350	13	.380
4	.287	4	.349
6	.262	12	.346
13	.237	6	.231

RETENTION TEST

Jamestown: The First
English Settlement in America

EXPERIMENT I

SONG TOTIV

* * * * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
19	.646	12	.597
6	.642	1	.555
20	.627	18	.553
5	.590	20	.549
18	.575	5	.545
8	.528	19	.524
1	.519	16	.522
9	.509	24	.500
14	.495	6	.494
10	.481	14	.478
22	.481	27	.454
26	.462	26	.454
24	.448	10	.430
27	.439	9	.416
15	.434	13	.415
21	.429	7	.412
7	.420	22	.406
23	.382	21	.388
16	.382	25	.366
13	.377	8	.377
12	.363	11	.370
25	.349	2	.327
11	.302	3	.299
2	.302	4	.282
4	.297	15	.254
17	.283	23	.192
3	.278	17	.062

POSTTEST

Age of Discovery

EXPERIMENT II

* * * * * ITEMS SEQUENCED ACCORDING TO DIFFICULTY INDEX AND DISCRIMINATION INDEX

ITEM	DIFFICULTY INDEX	ITEM	DISCRIMINATION INDEX
8	.735	14	.691
10	.711	7	.611
7	.706	2	.606
14	.701	11	.589
12	.676	1	.566
5	.672	3	.560
2	.632	8	.544
9	.598	9	.540
13	.559	10	.514
4	.539	13	.493
3	.510	5	.486
11	.480	12	.389
1	.368	6	.369
6	.319	4	.358

POSTTEST

Jamestown: The First
English Settlement in America

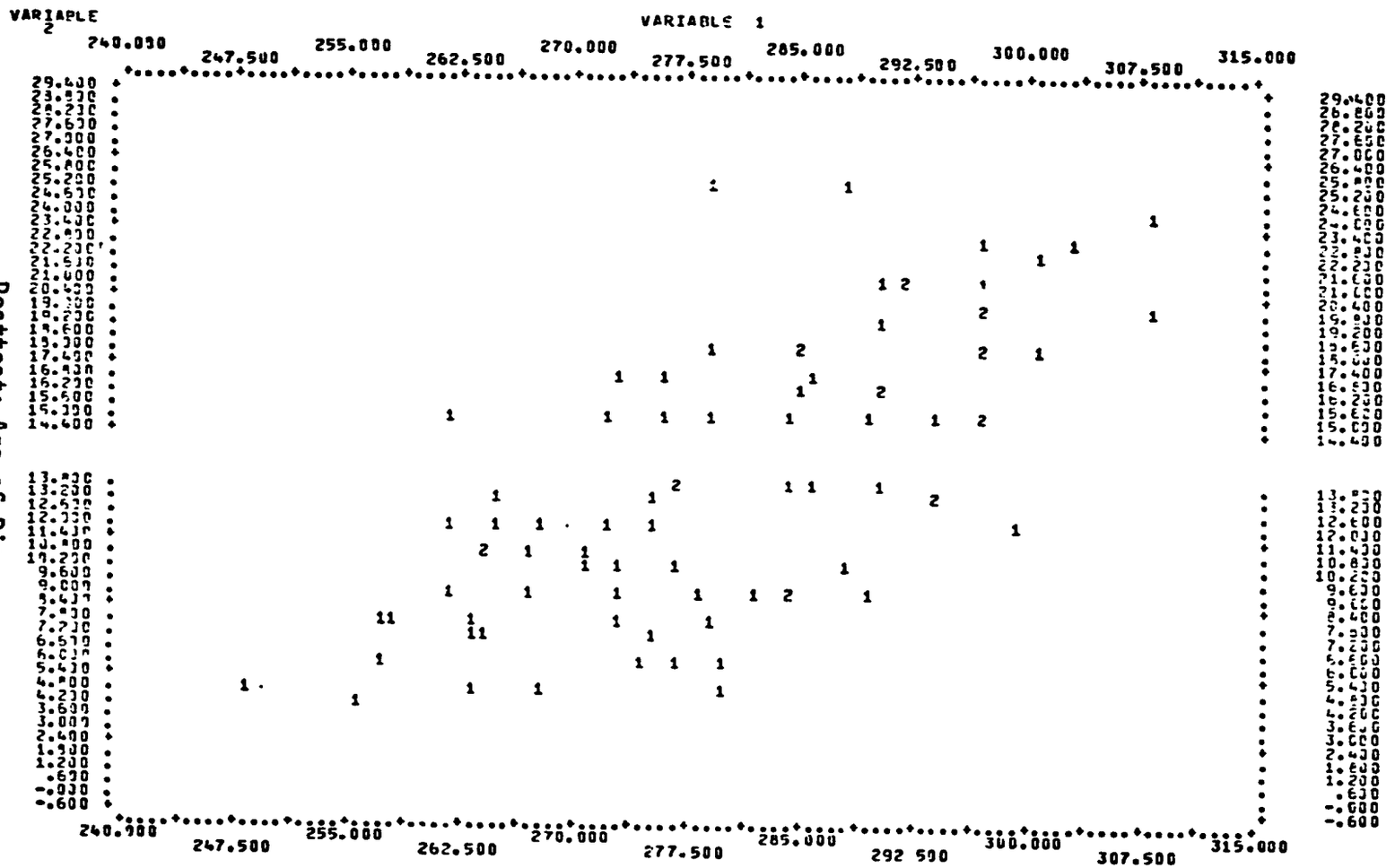
EXPERIMENT III

APPENDIX G

CORRELATIONS BETWEEN ACHIEVEMENT TESTS AND LISTENING COMPREHENSION TEST

CORRELATION MATRIX

	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.6907	1.0000						



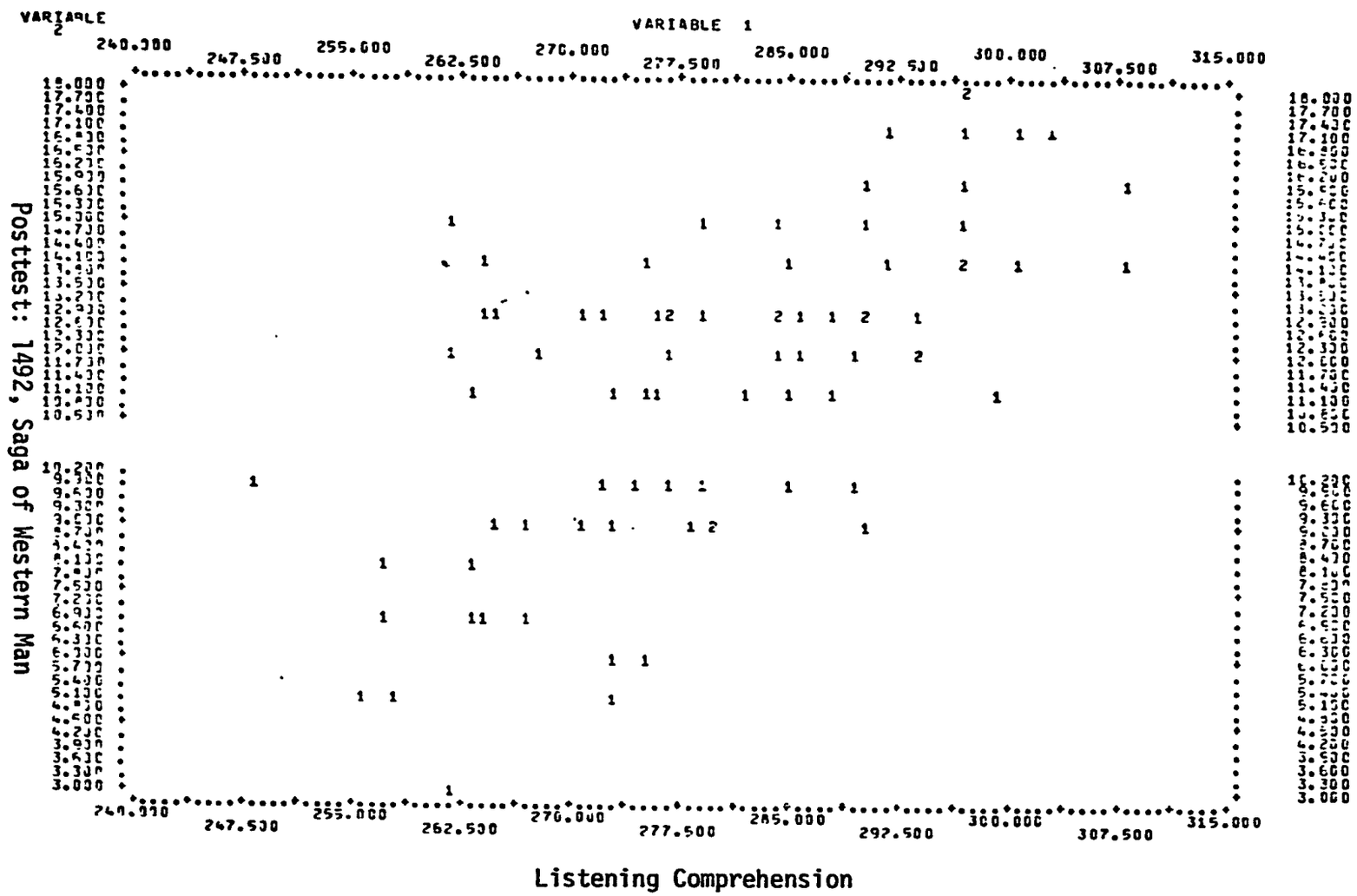
Posttest: Age of Discovery

Listening Comprehension

Experiment I

CORRELATION MATRIX

	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.6454	1.0000						



Posttest: 1492, Saga of Western Man

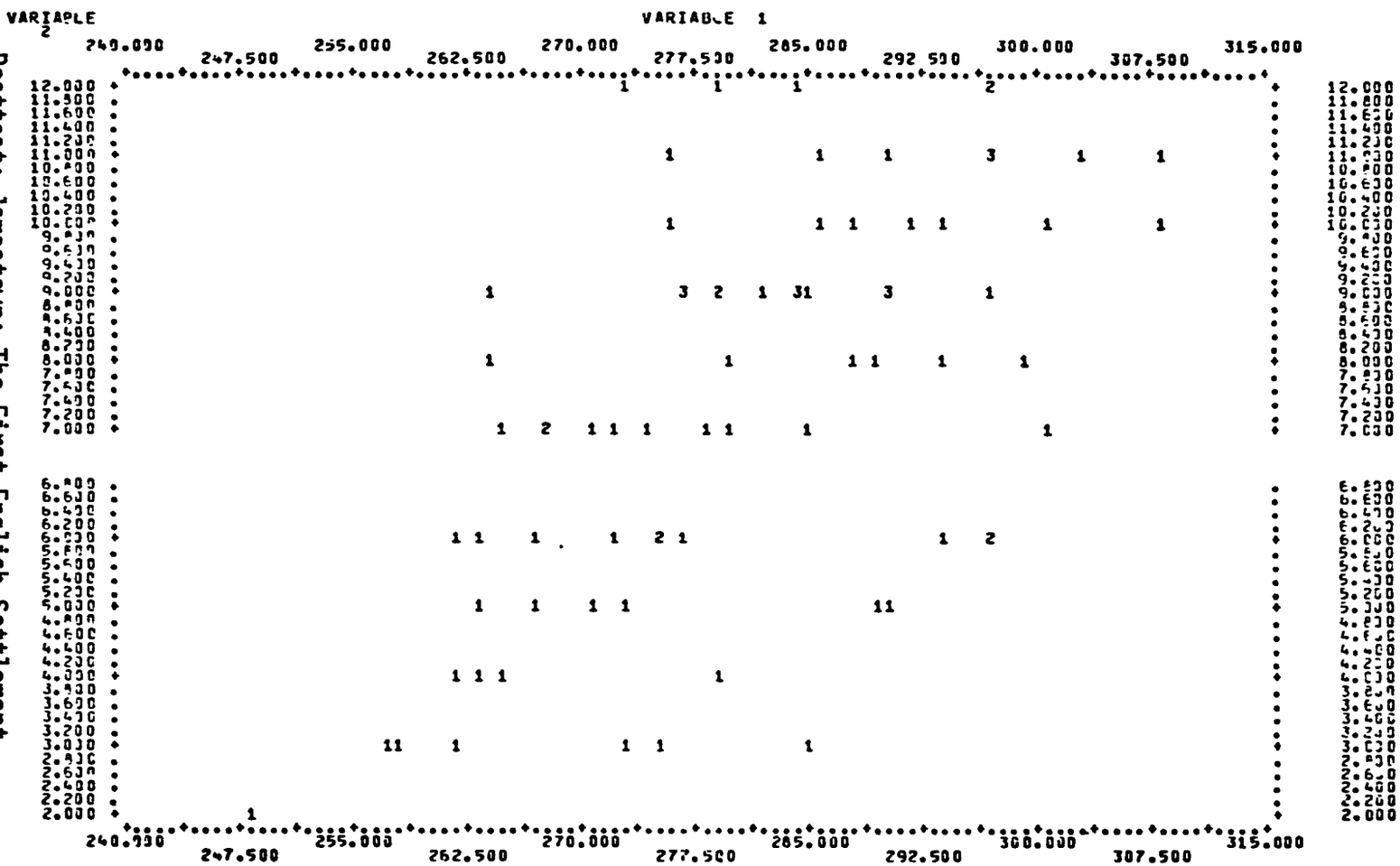
Experiment I

Experiment I

Posttest: Jamestown: The First English Settlement in America

CORRELATION MATRIX

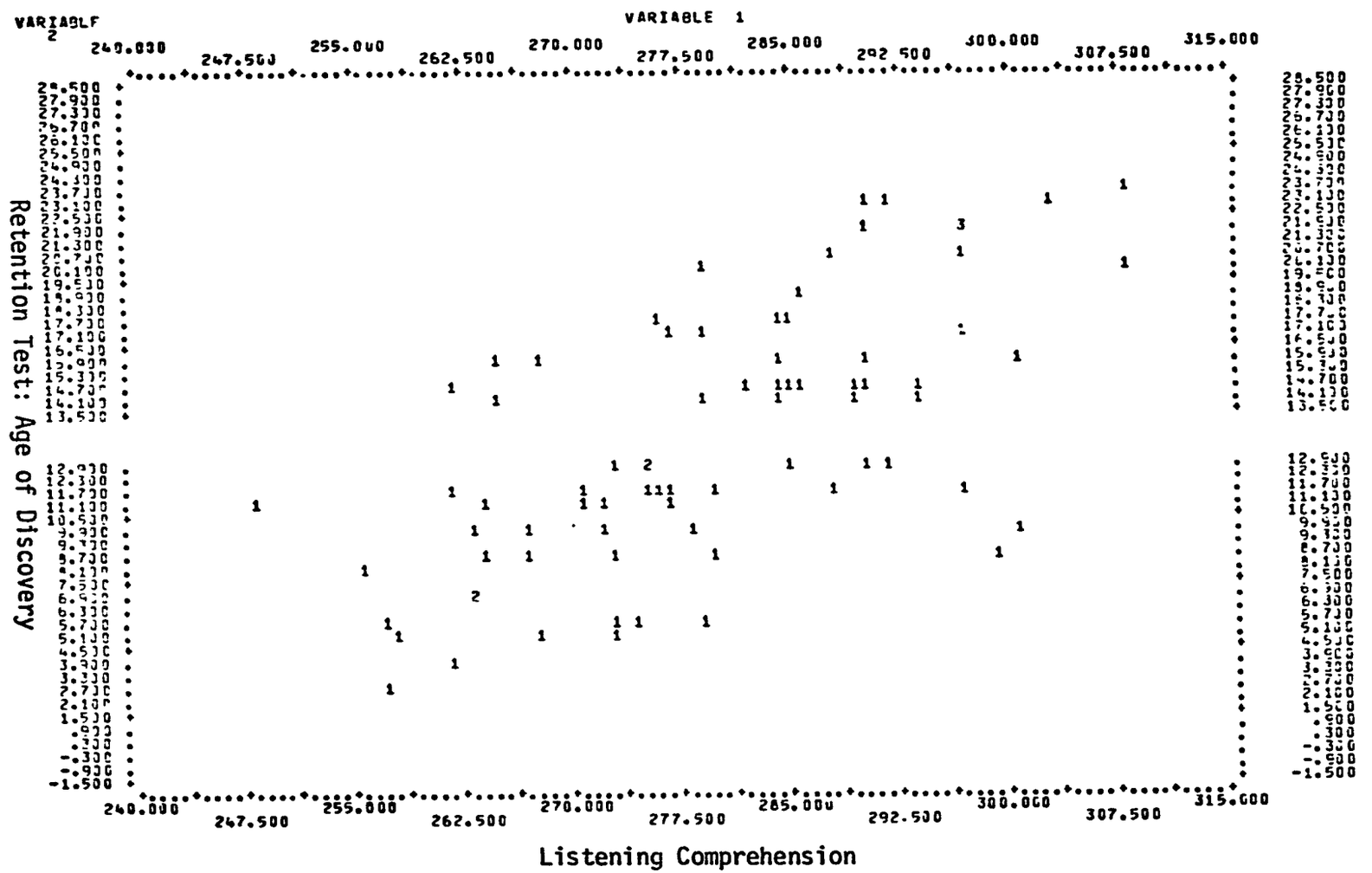
	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.5945	1.0000						



Listening Comprehension

CORRELATION MATRIX

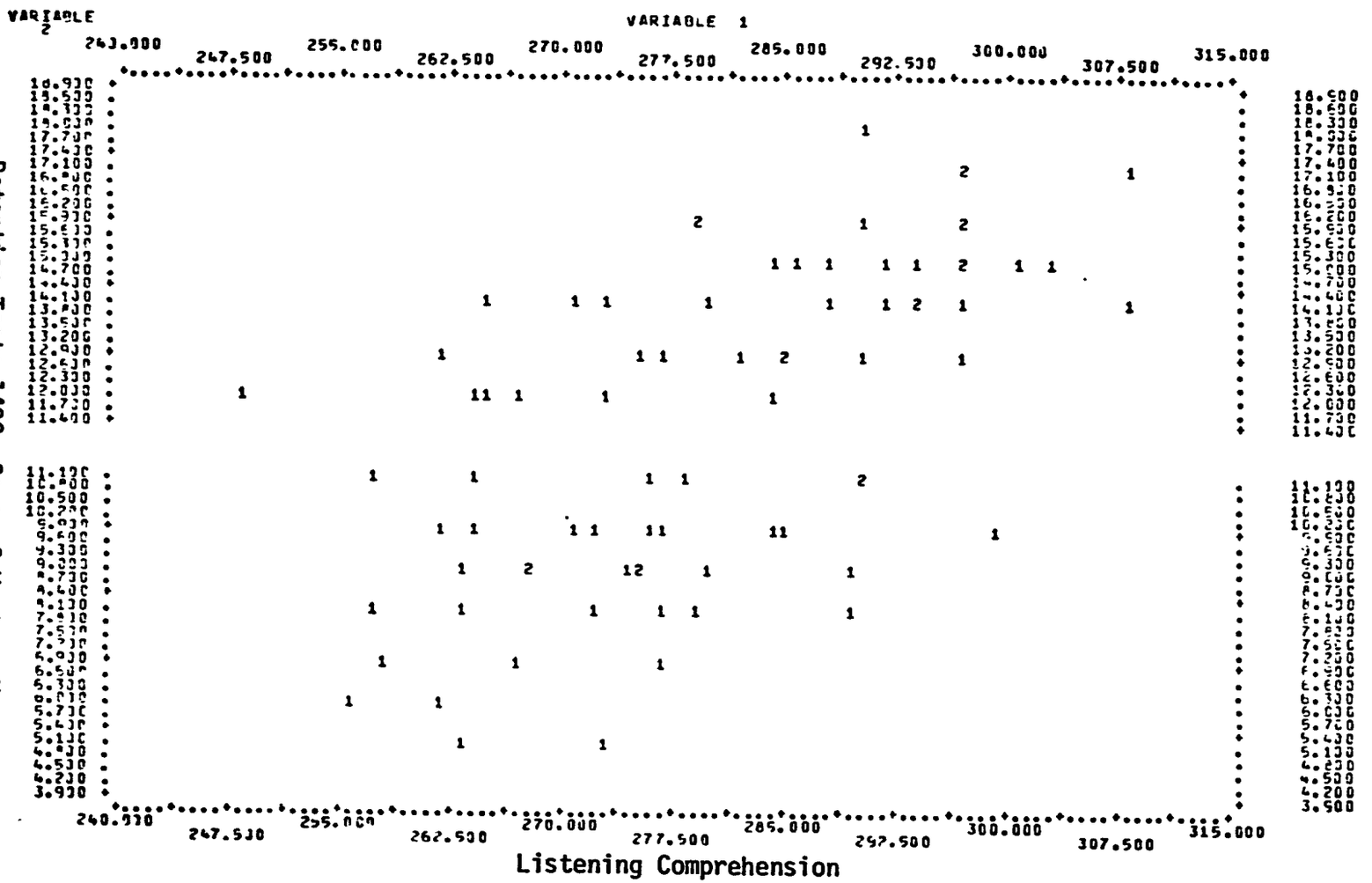
	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.6582	1.0000						



Experiment I

CORRELATION MATRIX

	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.6097	1.0000						

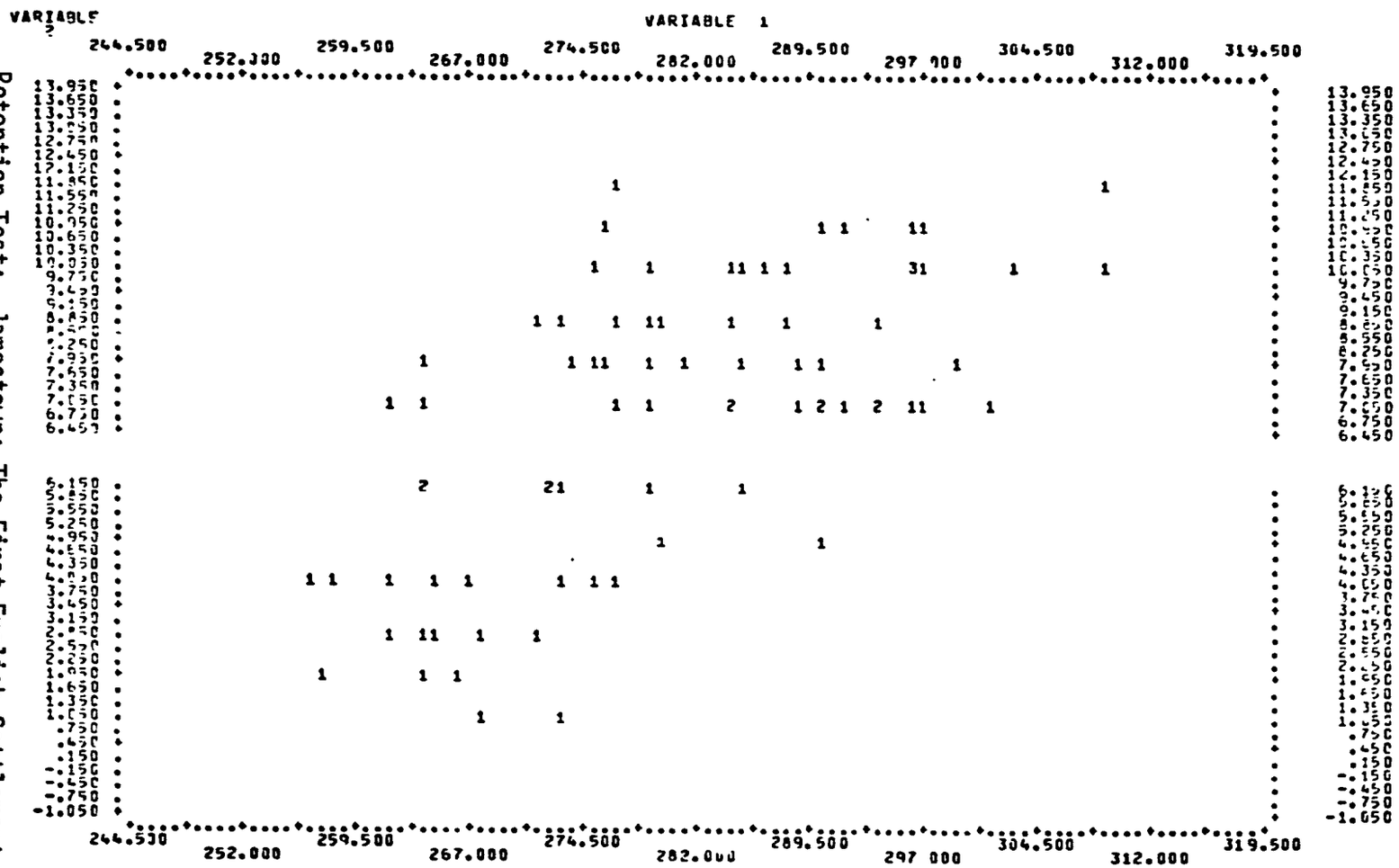


Retention Test: 1492, Saga of Western Man

Experiment I

CORRELATION MATRIX

	COL. 1	COL. 2	COL.	COL.	COL.	COL.	COL.	COL.
1	1.0000							
2	.6383	1.0000						



Listening Comprehension

Retention Test: Jamestown: The First English Settlement in America

Experiment I

APPENDIX H

LETTERS OF PERMISSION FOR RESEARCH

SCHOOL BOARD OF LEON COUNTY
P O BOX 2825 / 2757 WEST PENSACOLA STREET
TALLAHASSEE FLORIDA 32304

NED B. LOVELL
SUPERINTENDENT

BOARD MEMBERS
BILLY F KETCHAM, Chairman
PETER W EVERETT Vice Chairman
MIKE J BEAUDOIN
BHOWARD P DAVIS
BARBARA TODD

C GRAHAM CAROTHERS
School Board Attorney

January 10, 1975

Yoo Jae Song
Box #U-4932
Rogers Hall 704
FSU
Tallahassee, Florida 32306

Dear Miss Song:

The Leon County Advisory Committee on Research has approved your request. This approval allows you to contact the principal of the school in which you wish to conduct your study. The principal has the responsibility for making the decision relative to his school. I suggest that you talk by phone or make an appointment for a conference.

It will be your responsibility to see that my office is provided the names of the school in which you are conducting your study. To help you, I am enclosing an agreement form which should be signed by the participating principal and returned to me.

A copy of your signed application is enclosed for your records.

If I can be of any further assistance, please feel free to call me at 576-8111.

Sincerely,

Hugh I. Peck
Chairman, Research Advisory Committee

HIP:jb
Enc.

Leon County Guidance Office
2757 West Pensacola Street
Tallahassee, Florida 32304
Phone 576-8111

RESEARCH REQUEST FORM

DATE December 12, 1974

I Background Information

To be submitted in triplicate to the above address for review by the Advisory Committee on Research in Leon County Schools.

Name of university person requesting the research Yoo Jae Song
Address Box #U-4932 (Rogers Hall 704) Phone 644-5658 or 644-6435 (office)
Type of research: FSU, Tallahassee
Test Experimental study & tests Questionnaire
Survey Check List Other
(Submit a sample copy with application)
School record to be used:
Cumulative folders Statewide test results
County test results Other
Statement of problem or title of study "Effect of Behavioral Objectives and Programmed Instruction on Learning from Instructional Film."
Subject: Social Studies (Mr. Rican Wiggins)
Purpose of study: Determine whether learning from instructional film can be enhanced by using behavioral objectives and programmed instruction.
Additional comment: This will be the continuation of the previous experiment at FSU R&D School.
The pretests and two retention tests (2 weeks after the posttest) will be scored by an outside agent and the data obtained from this study will be the base of my dissertation.

I Procedure
Date of administration of test Mid-January, 1975 Kind In-class; two films
Time required for administering two full class periods for each film plus 10-min. retention test.
Amount of school time involved About 45 hours
What levels? 7th graders (Social studies)
Number involved: School One (Cobb Middle School) Students 311
How administered: In Groups intact classes Individually
Description of population to be used: Students who have not been instructed in topics: Westward Expansion & Age of Discovery
Method of sampling to be used Randomized by classroom.
Time students will be taken out of regular classes: About 4 hours.
Findings * will be made available to Leon County Schools
will not

Signature of Applicant

II Approval

Major University Professor

Chairman, Research Advisory Committee

Director of Secondary Education

Director of Elementary Education

PURDUE RESEARCH FOUNDATION
WEST LAFAYETTE, INDIANA 47907

March 13, 1975

Miss Yoo Jae Song
Box U-4932
Florida State University
Tallahassee, Florida 32306

Dear Miss Song:

Permission is granted for your use of the "Scale for Measuring Attitudes Toward Any Practice," Form A, in an experiment for your dissertation on the following basis:

1) Proper credit to Purdue Research Foundation must be given, the form being: "Copyright 1960, Purdue Research Foundation, Reprinted with permission."

2) A copy of the scale used in your dissertation will be forwarded to Purdue Research Foundation.

3) It is our understanding that this instrument will not be sold commercially.

If you are in agreement with the foregoing, please sign the copy enclosed.

Sincerely,

William D. Griggs
Assistant Treasurer

Enclosure

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VITA

Yoo Jae Song was born in Korea on May 3rd, 1943. She received her B.A. and M.A. degrees in Journalism from Ewha Woman's University, Seoul, Korea in 1966 and in 1968.

Miss Song completed a Master of Science degree in Educational Research and Testing in 1973, and received a Ph.D. in Instructional Design and Development in 1975 from The Florida State University.

As a research assistant at the Department of Educational Research and Testing between March 1972 and October 1972 she worked on a readability project analyzing reading materials by computer. She was a graduate assistant at the Center for Educational Technology, Florida State University, for a Korean project for instructional materials development from January 1973 to August 1974. From September 1974 until May 1975, she worked as a research assistant at the Center for Educational Technology, developing an instructional systems model for the U.S. Joint Services.

Miss Song is a member of American Educational Research Association. The primary areas of research interest to Miss Song include the uses of instructional film, the design and development of instructional materials, mass media, and educational technology.