ABSTRACT
        A brief discussion of three phases in research on
instructional films--whether films can teach (approximately
1910-1950), how films teach (1940 through the late 1950s), and who
learns from films (1960-1985)--introduces a review of the research
literature on the third phase. The experimental studies reviewed
focus on three concerns: (1) use of films to teach higher level
cognitive skills; (2) effects of film viewing on individual learning;
and (3) effects of film viewing on students' self-concepts. The
following conclusions were drawn from the literature review: films
are effective in teaching students the skills of inquiry learning,
discovery, and problem-solving; unstructured films generate more
relevant questions and hypotheses in problem-solving activities than
structured films; films are particularly effective in teaching
observation skills and in training students to attend to important
details; high-aptitude students tend to benefit less from visual cues
in films than low-aptitude students; films tend to be more effective
with field independent students who are left brain dominant,
independent, active, and high in personal responsibility; films can
have a positive influence on students' self-concepts; and at least
one study found sex role stereotyping in films for young children.
Implications of these findings for teachers are indicated for each
conclusion, and a 34-item reference list is provided. (JB)

ED267757

IR 012125

INSTRUCTIONAL FILM RESEARCH AND THE LEARNER

BY

MELVIN MCKINNEY BOWIE

201 Peabody Hall
University of Arkansas
Fayetteville, Arkansas 72701

INSTRUCTIONAL FILM RESEARCH AND THE LEARNER

Research into the value and effectiveness of motion pictures in education has spanned more than six decades. Most of the work was done prior to 1970, with the m,   1950's representing the peak of activity. Hoban and van Ormer (1970)   .ewed the research conducted between 1918 and 1950. Since that time there appears to be no indepth search which focuses entirely on the instructional film. This was due largely to the new interest in instructional television. Of the nearly three hundred and thirty-five studies analyzed by Reid and MacLennan (1967), only thirty percent of them dealt with instructional films, while the other two-thirds were concerned with the effectiveness of instructional television. Other writers such as Allen (1960), Lumsdaine (1963), Twyford (1969), Simonson (1980), and Seibert and Ullmer (1982) compiled definitive findings from the research on communication media in general. Their writings did not focus on work with instructional film in particular.

If one were to look closely at the research on instructional film, three distinct phases in the research become apparent. The first phase emphasizes the capacity and capabilities of film as a medium for teaching groups of learners effectively. These studies, which spanned roughly from the late 1910's to the early 1950's, focused on the film itself and what it could or could not accomplish as an instructional tool. These studies primarily analyzed the capacity of film to teach basic facts and concepts when compared to conventional teaching. A few studies of that period even compared film teaching to teaching with other types of media such as filmstrips and still photographs. Later, research efforts shifted to the manipulation of certain film qualities in an attempt to achieve a given learning outcome. In these studies, conducted primarily during the 1940's and 1950's, researchers experimented with the presence or absence of color, sound effect,, music, animation, and narrative structure.

Then, around 1960 the research slowly began to focus on the learner. The research question now became, "Who learns from films?" rather than, "Can films teach?" or "How do films teach?" The two latter questions imply a sort of overt action on the part of the teacher in which something is done to the learner. The first question is more covert in nature. Here, the burden for action is placed on the learner. The first question analyzes what the learner brings to a learning situation, while the other two look at what the teacher brings to an instructional situation. Focus on the learner thus presented researchers with a number of new variables for study. Intelligence, aptitude, learning style, personality variables, maturation, ethnic background, sex, and other individual traits came under study as these traits interacted with the attributes of motion pictures.

Figure 1 depicts the three phases of instructional film research conducted in this country over the past sixty-five years as gleaned from the literature. The illustration should in no way imply distinct breaks in the research efforts, but should be viewed as a continuous and dynamic search, with much overlapping between juxtaposed phases.

INSTRUCTIONAL FILM RESEARCH
1918 - 1985

CAN FILMS TEACH?

Wood and Freeman, 1929
Weber, 1922
Lashley and Watson, 1922
Lacy, 1919
Sumstine, 1?

HOW DO FILMS TEACH?

Hovland, Lumsdaine, and Sheffield, 1949
VanderMeer, 1950
stein, 1952
May, 1958
Rulon, 933
Wittich and Fowlkes, 1946

WHO LEARNS FROM FILMS?

Morin, 1973
Wright, 1978
Simonson, et al, 1985
May, 1965
Tiffin and Seibert, 1965
and Danoff, 1969
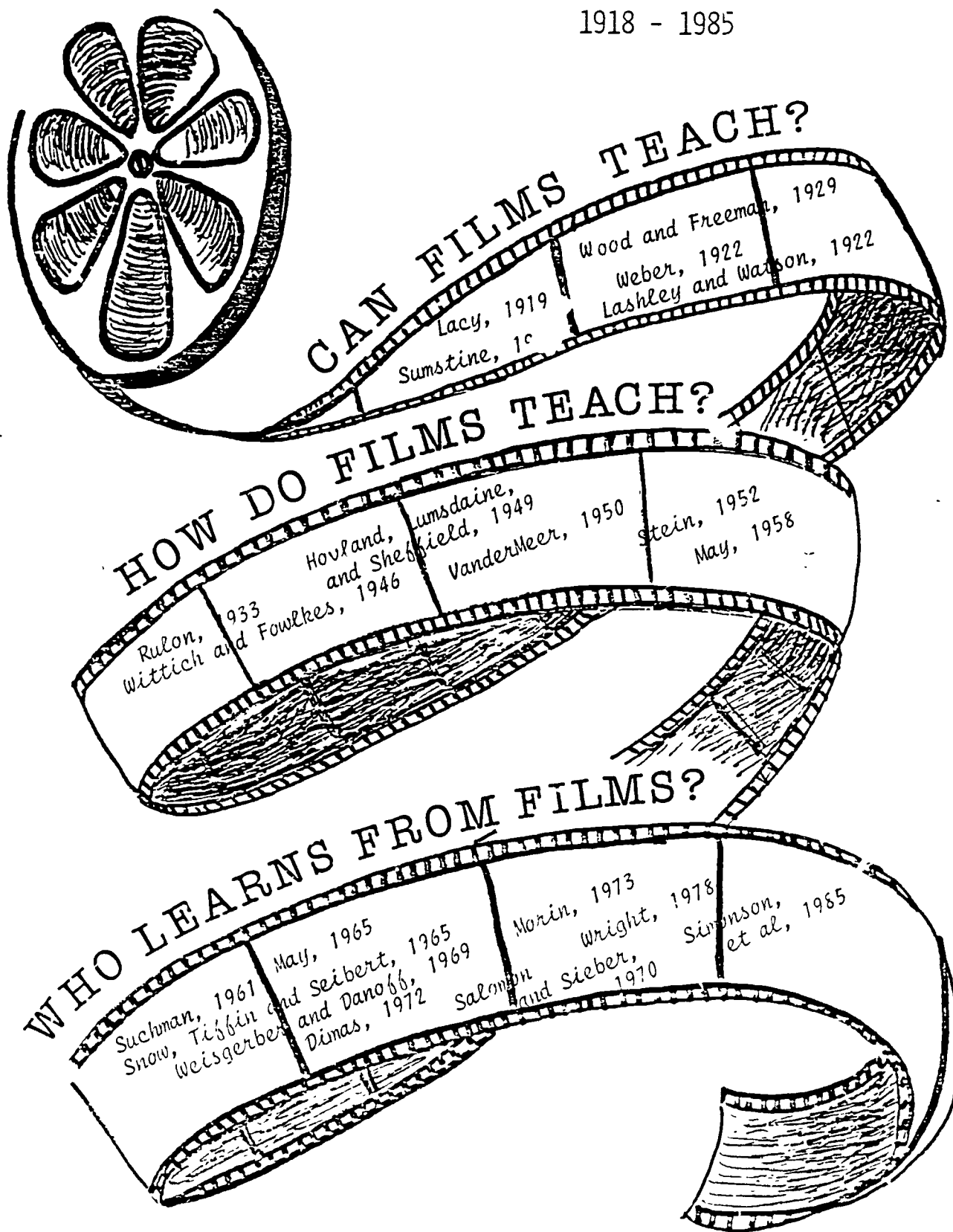Salomon and Sieber, 1970
Suchman, 1961
Snow, Weisgerber, Dinas, 1972

Figure 1.

The present paper concentrates on experimental studies which are representative of the third phase. These studies focus on the the question, "Who learns from film?" They were conducted primarily between 1960 and 1985 as this was the period in which the research interests appear to have shifted from the film to the student. The paper does not, however, focus on all individual differences that were studied, but deals mainly with the development of higher level cognitive skills through the use of films, the effects of film viewing on individual learning styles and other learner differences, and the effects of film viewing on the self-concepts of students. It was reasoned that these findings might be of the most value to teachers as they seek solutions to some of the most challenging problems confronting them in practically every classroom.

Purposes

This paper has four (4) main purposes. (1) It seeks to report the findings from instructional film research which focus on the use of films in helping students to master higher cognitive learning, particularly among the talented and gifted. Higher cognitive learning is concerned with mastery of problem-solving and inquiry skills which include hypothesis generation, the generation of appropriate questions, the development of observation skills, and hypothesis testing and evaluation.

(2) The paper will summarize the available research on the interaction between film viewing and learning styles. While these studies are few in number, they represent a promising approach to a difficult question---"What works for what type of learner?"

(3) The paper seeks to summarize the research findings on the use of films in enhancing the self-concepts of school-age children. The problem of low self-esteem, particularly among minority inner-city students, has long been regarded as an obstacle to academic achievement. Self-concept has also been found to be an important differential in teaching females in science and mathematics classes.

(4) The paper will then discuss implications of the research findings and make recommendations for their applications in a normal classroom. This section emphasizes the fact that the use of films in teaching and learning did not represent a panacea for all of the ills in the classroom, but they did bring a fresh approach and need variety to the scene.

The Effects of Films on Higher-Cognitive Learning

It has generally been accepted that film viewing is an effective and efficient method for helping students to increase their store of basic facts and concepts. It is not enough, however, to simply teach facts in the classroom. Teachers must also help students in learning broad general principles, and in mastering inquiry and problem-solving skills that are so needed in order to function in a complex society. A few experimental studies have attempted to determine the effectiveness of films in helping students to master these types of skills.

The effects of informational-expository and historical-dramatic types of films on student abilities to master the scientific method were studied by Kazem (1960). Four groups of high school students were

matched on pre-test knowledge, intelligence, reading ability, sex, age, and school location. One group saw two informational-expository films. A second group saw two historical-dramatic films, and a third group saw one of each type. The control group did not view films. Film groups significantly out-scored the control group on the application of knowledge tests. The group viewing a combination of films made more gains that did the group viewing historical-dramatic films, but the differences were not statistically significant. High ability students made consistently higher scores, but students of average intelligence made the most gains. Test scores between the sexes did not differ.

At the University of Illinois, Suchman (1961) believed that when children reach the operational stage of development, they can be trained in the mastery of inquiry skills. Exposing children to a systematic process of discovery is the key to such training. Drawing on the writings of Jerome Bruner and others, Suchman summarized the benefits of the training (p.151): (a) exploration, manipulation, and mastery are intrinsically motivating; (b) a reinforcing sense of power and self-confidence comes from successful autonomous discovery; and (c) the strategy of data intake and processing has an important effect on the productivity and depth of discovery. The author then described the results of an experimental program called Inquiry Training designed for students in the intermediate grades.

Fifty students of high ability were exposed to science problems using filmed demonstrations. Students were asked to identify objects in the demonstrations, verify conditions and changes in the objects during the demonstrations, and cite variables responsible for the changes. Student responses were recorded on the blackboard. They were then asked to identify conditions that could affect the outcome of the demonstration, such as, "What would happen if...?" Students then had to seek verification as to why the condition would affect the outcome. The author explained the importance of this method (p.162): "He learns that every episode contains objects, that the state of an object at a given time can be described by a set of attendant conditions, and that any change in a condition is an event...The child learns to identify first all objects and systems, and then to determine their conditions both at the beginning of the episode and immediately following each independent event." The films used in the study were organized and presented to expand on previous learning. Each film involved a new concept or a new variation of a previous one. Suchman felt that structuring the films in this manner was important in giving students a sense of progress.

Results of the study were cited in terms of individual progress. Students were observed in the number and types of questions they asked in problem-solving situations after Inquiry Training. Suchman, acknowledging the wide range in individual differences, concluded that this type of training had definite benefits in helping youngsters increase inquiry skills. The method proved particularly helpful with gifted students.

Allender (1968) described three studies using inquiry training with students in grades three through seven. The studies used specially developed films and other materials. As a test of inquiry skills, students were required to role-play a small city mayor. Increases in the desired behaviors directly correlated with increases in grade level, but no interactions were found with sex, intelligence, or reading ability.

Two studies conducted by Salomon and Sieber (1970) described a method for influencing the number of relevant questions and hypotheses generated based on the structure of the stimulus. In the first experiment, two films were used, one with structured sequences, the other with unstructured sequences. Students in one group were asked to write down the number of details observed in the structured film and to generate as many hypotheses as possible about the plot of the unstructured film. It was predicted that the unstructured film would solicit more questions but fewer hypotheses. In the second experiment, subjects were asked to memorize as many details as possible in the film scenes or to generate hypotheses. The dependent measure was the number of times subjects asked to review the film sequences. It was predicted that the number of details and hypotheses reported was directly related to the structure or lack of structure in the stimulus.

Results of the first experiment supported the hypothesis. Unstructured films produced more questions and generated more hypotheses than did structured sequences. The second experiment also produced significant differences between the two types of sequences in favor of the unstructured film. The authors concluded that uncertainty and information searching are maximized when a stimulus suggests many different responses.

A study which continued the efforts of Suchman (1961) and Salomon and Sieber (1970) was done by Wright (1978). The same films used by Suchman were used in this study. Students were assigned to three treatment groups during Phase I of the study. At this time, subjects were shown a film depicting a problem situation and were asked to list as many details and generate as many hypotheses for solutions as possible. Maximums were 75 for the former and 5 for the latter task. Fourteen months later subjects used a new set of films to test long-term retention of the previous training. The study found that students were significantly more successful in demonstrating the types of inquiry skills in which they had receive intensive training. For example, students who had been trained in attending cues to generate details about a problem were able to list a significantly higher number of details in a new problem situation than were students who had not had the training. An important conclusion of the study was that it "presents a model for investigating means of improving basic inquiry skills" (Wright, 1978, p.213). It was also assumed that the development of such skills could conceivably be carried out in the average classroom.

Another study of this type was conducted by Pearson (1972). Here, films were used as verbal mediators with nursing students to help sharpen their observation skills. The author designed the study in order to determine the feasibility of increasing the number of real observations reported by students in a patient-nurse contact and to minimize the number of inferences being reported as real observations. It was hypothesized that students receiving filmed instruction would report more observations and fewer inferences than would students not receiving the films. The study divided 129 students into three treatment groups. Two groups viewed special observation technique films, a preparatory film, and the test film. A third group saw only the preparatory film before the final test film. With the test film, students were asked to: "Please list below all the observation of fact or occurrence that you noticed about the patient in the filmed sequence

you just viewed" (p.288). A jury then classified responses as real observation or inference. Using ANOVA techniques, the researcher found that there were significantly fewer inferences reported as observation by the nurses who had learned observing skills with instructional films as compared to nurses who did not see the films.

The studies dealing with the development of higher cognitive skills have been few in number, but represent important work in the effective use of instructional films. Research findings indicate that it is possible through training to increase the ability of students to attend to details, pose relevant questions, and generate hypotheses in a given problem situation. These processes are vital to inquiry, problem-solving, and discovery learning. The research indicates that higher cognitive skills can be developed with the use of films in the very young as well as in adults. At least one study (Allender, 1968), found maturation as a differential in learning hypothesis generation. The research literature, however, presented no studies in which films were used to improve student abilities to test hypotheses, draw conclusions, and evaluate conclusions.

Effects of Films on Learning Styles

A great deal of attention in the instructional film research after 1960 focused on the general aptitude and intelligence levels of students as they interact with filmed materials. Little work, however, has been done with films and learning styles. Hoban and van Ormer (1970) discussed findings from the 1930's and 1940's which suggested that sound films facilitated learning in auditory type learners. May (1965) also discussed the relationship between sensory dominance and learning from media. However, three studies (Thomas, 1972; Smith, 1973; Simonson, et.al., 1985) looked specifically at cognitive styles and film learning, while one study (Snow, Tiffin and Seibert, 1965) tested a broader concept of individual differences and the amount of learning from a film. Two other studies (Salomon, 1972; Clark, 1973) which investigated the effects of aptitude on film learning are included here because of their unique contributions to an understanding of how learners learn with films.

The nature of a film's content on the behavior of young children was found to interact with the cognitive styles of the learners (Thomas, 1972). One hundred and forty-three boys, ages 5 years to 8 years were divided into three groups. One group watched an aggressive film, while a second group saw a nonaggressive film. A control group did not view films. A agression measure after the viewing found that age and cognitive styles were differential in the amount of aggressive behavior observed in the subjects. Younger boys were more aggressive than older boys. Cognitive styles became more differentiated with age.

Don Smith (1973) measured 400 college sociology students for cognitive style using the Rokeach dogmatism scale-Form E. Two groups of 200 each took identical final examinations after one group had been taught with lecture and the other with films. Results of the study indicated no differences in test scores on patterns of cognitive style, GPA, sex, or major field of study. The author pointed out that the study used group effects rather than individual effects in an attempt to replicate group problems usually confronted by the average teacher.

Thus, the results must be interpreted as evidence of the general
effectiveness of films in teaching.

Five studies at Iowa State University looked at "learner aptitude
interaction with media type when attitude change is the goal of
instruction" (Simonson, et.al., 1985, p.4). The studies specifically
investigated the characteristics of field dependence (FD), field
independence (FI), and hemisphericity as they interacted with mediated
messages. Cognitive styles of the participating students were measured
using the Embedded Figures Test for FD/FI and the Conjugate Lateral Eye
Movement Test for hemisphericity. The studies focused on developing
desired student attitudes toward soil conservation, smoking, or disabled
persons.

Results of two of the studies indicated an interaction between
treatment and cognitive style. Students who had viewed the film on soil
conservation and who were field independent had higher attitude scores
that did the other treatment groups. Also, students who were field
independent and viewed the film on disabled persons were found the have
more positive attitudes toward the subject. Left brain dominant
students were found to have more positive attitudes toward soil
conservation than did right brain dominant students. The authors
concluded that motion pictures tended to work generally best for all
learners and for field independent learners in particular.

A broader concept of individual differences and learning from film
was studied by Snow, Tiffin and Seibert (1965) at Purdue University.
Four hundred and thirty-seven college physics students were divided into
film group and control group. Students were assessed for the personal
variables of ascendancy, responsibility, emotional stability, attitude
toward physics, attitude toward film, numerical and verbal aptitude, and
prior knowledge of physics. Results of the study indicated that
students who were active, self-assured, and independent performed better
with film than with face-to-face instruction. On the other hand,
students who were low in responsibility and tended to be unwilling to
take on independent learning activities preferred conventional teaching.
On the intellectual variables, students low in aptitude performed better
with the film treatment. The authors speculated that viewing the film
allowed low aptitude students an opportunity for needed clarification of
physics concepts.

In a discussion of the findings the authors concluded that
instructional method can inhibit learning in some students while
facilitating learning in others. It was hoped that the study would
provide grounds for decisions concerning the assignment of students to
alternative instructional treatments.

An explanation for the interaction between aptitude and film viewing
that was found in the study above could lie in the findings by Salomon
(1972). This researcher found that 8th and 9th ground students
internalized and imitated visual codes from motion pictures according to
their levels of mathematical and verbal aptitudes. It was hypothesized
that students low in aptitude would use visual cues for modeling and
internalizing visual information, and that students high in aptitude
would already have a useful internalization code and would only need
visuals to activate it. Both hypotheses were partially supported.
Students high in aptitude tended to notice fewer visual cues in a film
which depicted a solid object being unfolded into space. On the
visualization test these students were unable to reconstruct the object

as well as low aptitude students. It was suggested that low aptitude students did not already have a schematic code to be supplanted as did the high aptitude students, hence the greater attention to visual cues.

Further support for the explanation might also be found in a report by Clark (1973). College students in a psychology class were divided into film and control groups after their scores on the Hidden Figures part of the French Aptitude Test had been obtained. Using ANOVA techniques, the researchers found that low aptitude students performed significantly better with the film than with the teacher.

The film research on learning styles and other learner characteristics suggests that films are more effective with students who are field independent, left brain dominant, high in responsibility, self-assured, and who are low in mathematical and verbal aptitude. Face-to-face instruction tends to work best with passive, irresponsible. and high aptitude students.

The Use of Films in Changing Self-Concepts

It is generally accepted that students will not learn well if they bring to the learning situation negative or low concepts of themselves. Much work in educational research has been undertaken in the last twenty years to help improve student self-esteem. The influence of film viewing on the changing self-concepts of children, particularly among black children who come from low socio-economic homes, has been studied by a number of researchers (Weisgerber and Danoff, 1969; Teaham, 1969; Dimas, 1970; Morin, 1973, 1976). At least one study (Paroly, 1983) looked at the stereotyping of female social roles in films designed for elementary school children.

The study by Weisgerber and Danoff (1969) used a mixed group of black and white students to test changes in attitudes toward a black hero (Frederick Douglass). It also sought to discover if the film had any effect on the self-image of the black students. Two experimental groups viewed the film, while two control groups did not. Eight self-concept instruments were administered prior to the film and three days following the film. Responses were analyzed according to race, sex, and socio-economic status. The results showed that both control and treatment groups identified equally with the hero. One has to speculate about the researchers' choice of a film hero since Frederick Douglass is so well-known and accepted by most school-age youngsters. Surprisingly, the study did find differences on the variable of sex. Black females possessed more self-esteem than black males, while white males possessed more self-esteem than did white females.

In that same year, Teaham (1969) conducted further research dealing with the impact of film on the self-concepts of minority children. Teaham hypothesized that the viewing of films about successful black professionals would improve the self-concepts of black youth and would raise their levels of aspiration. Students in the study came from five inner city schools in a large midwestern city. One experimental group saw six films about black professionals and six films showing white professionals. A second experimental group saw six films, all showing black professionals. A control group saw no films. Attitude instruments were given one month prior to the film showings and one month after the films.

Students who saw the films changed significantly in their attitudes toward their own race and toward themselves. Students who only saw films with black professionals made the most significant changes. The latter finding was particularly true for black males from low socio-economic homes. Students in the control group moved in the opposite direction, showing less racial and self-pride over time. The study also found that black girls tended to have lower goal aspirations than did the boys.

A similar study by Dimas (1970) divided fourth and sixth grade black students into two groups. One group viewed films about black heroes such as Jackie Robinson and Martin Luther King, Jr. They also saw film segments of a black middle class family. A second group saw similar films, but these films portrayed white models. The study found that students who viewed the films with black role models later expressed more positive aspects of self-concept than did students who viewed films with white role models.

The findings in the Teahan and Dimas studies were not replicated by Morin (1973, 1976). This study sought to measure attitude changes of black students when exposed to a film with either black or white actors. It was assumed that the race of the communicator in a film would affect the attitudes of black students toward that film differently, particularly when the students were stratified by socio-economic status. It was believed that students from high socio-economic homes would identify more readily with white actors and that the opposite would be true for students from low socio-economic homes. The hypothesis was rejected. There were no changes in attitudes among either group toward the films. Morin concluded that black children were not overly preoccupied with the race of the film communicator, therefore the race of the film actor does not significantly affect the attitudes of minority children.

Paroly (1983) wondered about the effects of educational films on the self-concepts of female children. Analyzing the degree of female stereotyping in 32 films produced for elementary school children between 1975 and 1980, the investigator found that male and female roles were not equal in portraying occupational or vocational behaviors. Males were more often portrayed in achievement or leadership roles, while females were more often portrayed in nurturing or submissive roles. The Paroly study suggests that because young children tend to accept the "authority" of films in a learning situation, the use of certain films may work adversely in efforts to form positive self-concepts among children.

While one study found no interaction between the self-concepts of minority children and film role models, most of the evidence supports the presence of such an interaction. Films have been found to foster racial pride among minority students and to postively influence the way these students think of themselves. Other evidence suggests the presence of sex biases in many instructional films which are currently being used in elementary schools. Teachers are subsequently urged to become aware of these films and their potential negative effects on the self-concepts of female children.

Conclusions and Implications

Instructional film research which focused more closely on the learner has provided the classroom practitioner with important clues to differences in learner characteristics and how these differences affect learning under various conditions. While the number of studies of this type has been disappointing, the work that has been done is of tremendous value to teachers as they seek effective methods of instruction for all types of students. The popular acceptance of film as a teaching and learning tool coupled with the fact that most schools have ready access to some kind of film collection, increases the value of the film research literature as a source of possible answers to some difficult questions.

The following conclusions and implications are drawn from the film research literature:

1. Films are effective in teaching students the skills of inquiry learning, discovery, and problem-solving. Teachers who work with gifted and talented students should consider the frequent use of appropriately-designed films.

2. Unstructured films have been found to generate more relevant questions and more hypotheses in problem-solving activities than structured films. When these higher-cognitive activities are a goal of instruction, teachers should seek out and use unstructured films.

3. Films have been found to be particularly effective in teaching observation skills and in training students to attend to important details. Teachers should consider the use of films for needed training prior to assigning tasks which will require the use of these skills.

4. Students who are high in mathematical and verbal aptitudes tend to benefit less from visual cues in films, while students with low aptitudes tend to imitate and internalize such cues. Teachers should, therefore provide students who are poor in mathematical and verbal ability with frequent opportunities to take advantage of film viewing.

5. Films tend to be more effective with students who are influenced by internal forces (field independent), are logical and analytical (left brain dominant), are independent, active, and are high in personal responsibility. Teachers are thus cautioned against the consistent use of films with students who are passive, irresponsible, and who tend to be more influenced by external forces (field dependent).

6. Films have been found to positively influence student self-concepts. Teache s should consider the frequent use of films depicting appropriate role models for deprived minority youngsters when working with this type of student.

7. At least one study found the stereotyping of sex roles in films for young children. Teachers should, therefore, become aware of such biases anc should closely preview all films before using, particularly with very young children.

BIBLIOGRAPHY

Allen, W.H. "Audio-visual communication." In Chester Harris, ed. Encyclopedia of Educational Research. 3rd ed. Macmillan, 1960, 115-137.

Allen, W,H. Effects of Audiovisual Materials on Changing the Attitudes of Cultrually Disadvantaged Youth. 1968. (ERIC Document ED 020 298)

Allen, W.H. "Instructional media research: past, present and future." AVCR, 20 (1972), 5-18.

Allender, Jerome. The Teaching of Inquiry Skills. 1968. (ERIC Document 020 805)

Clark, Richard. "Research abstracts." AVCR, 21 (1973), 265-267.

Dimas, Chris. "The effect of motion pictures portraying black models on the self-concept of black elementary school children." AVCR, 20 (1972), 104.

Hoban, Charles and Edward Van Ormer. Instructional Film Research, 1918-1950. Arno Press, 1970.

Kazem, Ahmed. "An experimental study of the contribution of certain instructional films to the understanding of the elements of scientific method by tenth-grade high school biology students." Dissertation Abstracts, 21 (1961), 3019.

Lumsdaine, A.A. "Instruments and media of instruction." In N. Gage, ed. Handbook of Research on Teaching. Rand McNally, 1963, 583-682.

May, Mark. Word-picture Relationships in Audiovisual Presentations. 1965. (ERIC Document ED 003 54)

Meirhenry, W.C. "Some historical and current developments in motion pictures." In James W. Brown and Shirley Brown, ed. Educational Media Yearbook 1982 Littleton, CO: Libraries Unlimited, 1982, 75-83.

Molstad, John. "Fourth annual report of the circulation of nonprint educational media in public schools, 1980-1981." In James W. Brown, ed. Educational Media Yearbook 1983, 90-100.

Morin, Andre. "Do educational films produced with same race communicators promote learning?" Journal of Negro Education, 45 (1976), 197-203.

Morin, Andre. "An exploration of the effects of the factor of identification in the production of single concept instructional films on changing attitudes of black students at two socio-economic levels." Dissertation Abstracts, 34 (1973), 3706.

Paroly, Jeanette. "Vocational and behavioral sex role stereotyping of female characters in elementary school educational films." Dissertation Abstracts, 43 (1983), 3221.

Pearson, Betty. "Applying learning theory and instructional film principles to films for learning observation skills." AVCR, 20 (1972), 281-295.

Reid, J. and Donald MacLennan. Research in Instructional Television and Film. 1967. (ERIC Document ED 015 673)

Salomon, Gavriel. "Can we affect cognitive skills through visual media? an hypothesis and initial findings." AVCR, 20 (1972), 401-422.

Salomon, Gavriel. "Internalization of filmic schematic operations in relation to individual differences." AVCR, 21 (1973), 265-266.

Salomon, Gavriel and Joan Sieber. "Relevant subjective response uncertainty as a function of stimulus-task interaction." American Educational Research Journal, 17 (1970), 337-349.

Seibert, Warren and Eldon Ullmer. "Media use in education." In Harold Mitzel, ed. Encyclopedia of Educational Research. 5th ed. Free Press, 1982, 1190-1202.

Simonson, Michael. Instructional Media, Attitude Formation and Change: a Critical Review of the Literature. 1980. (ERIC Document ED 194 073)

Simonson, Michael. "Media and attitudes: a bibliography--Part 2." ECTJ, 28 (1980), 47-61.

Simonson, Michael, et.al. Persuasion: Five Studies Dealing With the Relationships Between Media, Attitudes, and Learning Style. Paper delivered at AECT National Convention, Anaheim, 1985.

Smith, Don. "Teaching introductory sociology by film." Teaching Sociology, 1 (1973), 48-61.

Smith, Herbert. "Intelligence as a factor in the learning which results from the use of educational sound motion pictures." Journal of Educational Research, 46 (1952), 249-261.

Snow, Richard, Joseph Tiffin and Warren Seibert. "Individual differences and instructional film effects." Journal of Educational Psychology, 56 (1965), 315-326.

Spigle, Irving. "The cumulative effects of selected educational
motion pictures on the attitudes of high school boys and the
relatiorship of attitude changes to selected personality and
intelligence factors." Dissertation Abstracts, 15 (1955), 2066.

Suchman, J. Richard. "Inquiry training: building skills for
autonomous discovery." Merrill Palmer Quarterly, 7 (1961), 147-169.

Teahan, John. Some Effects of Audio-Visual Techniques on Racial
Self-Concept. 1969. (ERIC Document ED 040 263)

Thomas, Sally. The Role of Cognitive Style Variables in Mediating
the Influence of Aggressive Television Upon Elementary School
Children. 1972. (ERIC Document ED 065 175)

Twyford, Loran. "Educational communications media." In R.L. Ebel,
ed. Encyclopedia of Educational Research. Macmillan, 1969,
367-380.

Weisgerber, Robert and Malcolm Danoff. Evaluating the Potential of
Films for Improving Self Image in Minority Group Children. 1969.
(ERIC Document ED 044 026)

Wright, E. "Effect of film-mediated intensive instruction on basic
problem-solving skills of ninth graders." ECTJ, 26 (1978), 207-214.