August 10, 1961

To the Graduate Council:

I am submitting herewith a thesis written by C. Sankaranarayanan entitled "A Study of the History and Development of Visual Aids used in Extension Work in the United States and Suggested Application of the Findings for the Development of a Visual Aids Section at the Agricultural College and Research Institute, Coimbatore, Madras State, India." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.

Robert L. Peters
Major Professor

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Dean of the Graduate School

A STUDY OF THE HISTORY AND DEVELOPMENT OF VISUAL AIDS USED IN EXTENSION WORK IN THE UNITED STATES AND SUGGESTED APPLICATION OF THE FINDINGS FOR THE DEVELOPMENT OF A VISUAL AIDS SECTION AT THE AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE, MADRAS STATE, INDIA

A Thesis

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

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by

C. Sankaranarayanan

August 1961

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CHAPTER I

INTRODUCTION

I. IMPORTANCE OF THE STUDY

It is hardly necessary to go outside the realm of daily experience to bring to mind the importance of visual communication in helping us form lasting impressions. Most educators find it more difficult to do an effective job of teaching without the aid of pictures and other visual materials. Research indicates that a person is most apt to remember that which has clarity and is seen to be novel and interesting.[1] An old Chinese adage aptly describes the value of visual instruction, "one picture is worth ten thousand words."

In studies of the comparative effectiveness of the various teaching methods commonly used by educators, experimental evidence has continued to favor the use of visual and audio-visual materials over other methods. Knowledge of these findings has caused educators to give more careful and increasing consideration to the use of such materials for training. An even larger number of schools and colleges are organizing audio-visual departments for the purpose of coordinating, testing and directing the acquisition and utilization of appropriate teaching materials.[2]

Today the use of visual and audio-visual materials is not regarded as mere use of instructional aids, but rather as an integral and important

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[1] What Research Shows about Visual Aids (Washington: United States Department of Agriculture, Extension Service, 1949), p. 19.

[2] Ellsworth C. Dent, The Audio-Visual Handbook (Chicago: Society for Visual Education, Inc., 1949), p. 5.

part of the curriculum. Addressing teachers in regard to their need to recognize the value of visual instruction in education, Herbert L. Spencer said:

> Teachers should know that sensory experience is the foundation of intellectual activity and that from 50 to 80 percent of these experiences come through the eyes. Very few teachers are fitted with the ability of making word pictures realistic. And yet, it is the realistic and concrete that children are interested in, and not the abstract and symbolic. It is necessary that the oral, written, or printed page be translated into a mental image before it means much to the child.[3]

Nothing is more important in the world today than the transfer of ideas from one person to another. In this overall process, which we call "communication," lies the potential for man to overcome ignorance and poverty. Visual communication and/or teaching methods offer the teacher unique opportunities to increase the clarity and effectiveness of his vital messages. Those who work in the fields of volunteer adult education, and who are challenged to extend research tested knowledge to the people who need it most, will find visual methods of particular value.

People in many newly independent nations of the world are currently engaged in heroic efforts to try to increase both the quantity and quality of the food and fiber produced on their farms. One of the problems with which they are faced is how to make desired changes in a relatively short period of time. One way is through an active program of extension education. Farm families must receive and use the most modern agricultural knowledge if they are to produce food and fiber abundantly and efficiently, and to compete with others on the market. The extension worker, therefore,

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[3] Norma Olin Ireland, The Picture File in School, College and Public Libraries (Boston: F. W. Faxon Company, 1952), p. 40.

is the "bridge," "the highway," "the link," between scientist and farmer.[4]

To a large measure the success of an extension worker as a teacher and the degree of progress made by his clientele will be determined by his ability to communicate ideas. To encourage people to make such progress he must first be able to communicate with them.

If he is to be successful, the extension teacher should first recognize that accurate communication is probably one of his most difficult tasks. It is difficult because every person in his audience is different. Each one is the product of his own past experiences. An approach that will work with one man, may not work with his neighbor. In every group there are those who do not see as well, hear as well, or do things with their hands as well as others. There are those who are less well able to follow abstract ideas. It is obvious that the effective teacher must train himself to be conscious of these differences, and to provide enough range and flexibility in his teaching methods to meet various audience situations. Visuals can help bridge the wide gaps in experience among individuals and provide a common background for all.[5]

In order to make the proper meanings clear and get recommended practices accepted, there will be need for making use of appropriate methods of communication that are readily at hand, and for improvising others as necessary. Research indicates that if the teacher has an adequate understanding of the communication process, and if he makes proper use of visual materials and methods, the job can be done more successfully.[6]

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[4]Using Visuals in Agricultural Extension Programs (Washington: United States International Cooperation Administration, 1960), p. 9.

[5]Ibid., p. 15.

[6]What Research Shows About Visual Aids, op. cit., pp. 34-36.

Among the many reasons why visual aids help in teaching are those listed below:

1. They help to give correct initial concepts. One of the chief functions of visual instruction is to give the learner true mental impressions, or concepts, at the time he learns about a subject or process.
2. They intensify impressions.
3. They vitalize instructions.
4. They give different pictures of experiences in activities outside the person's environment.
5. They give pictures of experiences with concrete things. Visual aids such as photographs give definite meaning to many words and thereby combat verbalism, or the use of words without attention to thought.
6. They arouse interest by attracting the attention of the learner.
7. They build and sustain interest.
8. They motivate.
9. They develop and change attitudes.
10. They supplement other learning.
11. They vary teaching.
12. They clarify.
13. They serve as reminders.
14. They save teaching time.[7]

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[7] Ibid., p. 2.

The visual aid movement has long since passed the initial stages, and become a potent factor in many training situations in the United States. Modern agricultural science is acquiring new knowledge and developing new technology in this country at an amazing rate. Agricultural extension work in the United States is a relatively well-developed program of informal adult education, when compared to similar programs in the rest of the world. The phenomenal increase in agricultural production that has taken place in the span of only two generations since the establishment of organized extension work in the United States gives adequate testimony to the soundness of extension's teaching methods and overall communication processes.

The Cooperative extension service in each state in the United States is served by an Information Service which either forms part of the Extension Service itself or is a section of a separate Publicity Department of the Land Grant College. The Information Service contributes to the speedy flow of results in a popular form, from research stations to county agents and farmers, through the provision of printed matter such as bulletins, leaflets and posters, and visual aids such as films, filmstrips and lantern slides. Relatively speaking, extension services in India are not so adequately served with visual-aids, technical material, propaganda releases and publicity. Provision for adequate and suitable Information Services in Indian States where they are not already available is overdue. They should be made available so as to contribute to the further development of Indian agriculture at an increasingly more rapid rate.

India at present is striving hard to increase both the quality and abundance of food produced on its farms. To speed up this vital effort, the results of agricultural research must be communicated to the farmers, who then should be encouraged to put more of the information to practical use more quickly. Research indicates that visuals can help best in this communication process, particularly where literacy rates are low. With the present rate of literacy in India being 26.2 percent,[8] it is believed that such a study as this would be valuable and beneficial to the extension teachers. The study should also be of interest to those extension workers in the United States who may want to make greater and improved use of visuals in their teaching.

II. PURPOSE OF THE STUDY

The primary purposes of this study were: 1) to gather historical information about the development of visual aids in extension work in the United States: 2) to review the generally accepted theories of visual communication, and 3) to study and summarize the research done on the effectiveness of various individual visual aids. A secondary purpose was to utilize these findings as a basis for formulating a working plan for the development of a visual aids section at the Agricultural College and Research Institute, at Coimbatore, Madras State, India. By such study and adaptation, it is hoped that extension teaching may be made richer and more meaningful both to extension workers as well as farmers.

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[8] A. Mitra, "Population Trends and Literacy Rates in India, 1951-1961," The Hindu Weekly Review, April 3, 1961, p. 11.

III. MEANING OF VISUAL AIDS

The somewhat frequent misinterpretation of the term "visual instruction" seems to warrant brief consideration of its common meaning. The original designation "visual education" has been discarded by many, in as much as it seems to designate a special field in education rather than a set of materials and simple rules for the effective use of visuals, coordinated with educative activity.

An analysis of the factors affecting learning has developed another term, "visual-sensory aids," which seems to be in favor among leaders in this field. In "The Audio-Visual Handbook," this term is applied to all materials used in the classroom or in other teaching situations to facilitate the understanding of the written word.[9]

The term "visual aids" will be used in this study to include bulletins, charts, circular letters, exhibits, field trips, graphics, leaflets, motion pictures, method demonstration, news articles, posters, pictures, photographs, personal letters, result demonstration, tours and other visual aids.

IV. METHODS OF PROCEDURE

An investigation was made of available literature and theses to gather general information about communication and the types of visual aids used in extension work in the United States. Special efforts were

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[9] Dent, op. cit., p. 1.

made to collect and utilize literature authored by leaders in the field of visual aid research, including unpublished materials. After the data were gathered, they were analyzed and summarized, and suggestions were made for their application to the development of a visual aids section at the Agricultural College and Research Institute, at Coimbatore, Madras State in India.

V. ORGANIZATION OF THE STUDY BY CHAPTERS

Chapter I includes a statement of the importance of the study and its purpose, the meaning of the term "visual aids", and an outline of the methods of procedure.

Chapter II will be devoted to a historical review of the development of visual aids.

Chapter III will be concerned with the development of a theory of communication for visual instruction.

Chapter IV is intended to identify the research done on the effectiveness and appropriateness of various individual visual aids and the results obtained.

Chapter V deals with the administration of visual aids programs in the United States.

Chapter VI is focussed on the growth in the use of Mass Media in India and the present situation in the Madras Agricultural Department.

Chapter VII includes the summary of findings, and suggestions for further study and use of the findings.

CHAPTER II

HISTORICAL REVIEW OF THE DEVELOPMENT OF VISUAL AIDS

Although such terms as "visual education," "visual instruction," "visual aids," "audio-visual instruction," "audio-visual aids" and "visual-sensory aids" are of recent origin as far as authoritative literature is concerned, the teaching method involved is extremely old. In fact, because it is both simple and natural, is is probably the most ancient method of conveying ideas.

I. PRIOR TO 17TH CENTURY

The use of visual instruction may be traced back through the entire educational history of the human race. In primitive times, it is believed that man first learned to convey his thoughts by signs, gestures, facial expressions and crude imitations. Then, he developed a vocabulary with which to express them orally. Primitive youth were doubtless taught to fish, hunt, swim, cook and protect themselves from enemies and the weather through observation, imitation and participation.[1]

At a somewhat later time came the use of hieroglyphics or picture writing. Early records were pictured records. Cave men drew pictures to warn and inform. Pictographs are usually cited as being among man's first attempts to utilize a phase of recorded visual education. The use of field trips, in a very basic sense, most probably preceded this attempt. The

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[1] F. Theodore Struck, Creative Teaching (New York: John Wiley and Sons, Inc., 1938), p. 224.

Egyptian development of clay-baked picture inscriptions, leading to hieroglyphic writings, and their utilization of flat and three dimensional images are examples of early uses of the visual technique.

The Greeks developed intellectual instruction in which real objects were used in teaching history and civic ideals. Some histories of education describe the emphasis that was placed upon the field trip in the early educational systems of Greece and Rome.[2]

The teaching value of art also was known to the Romans. The populace learned about war victories through sculpture. Visual aids were used in Roman schools to assist verbal instruction and were justified by intellectual leaders of the day. Cicero (B.C. 106-43) approved of visual forms as devices for helping people remember abstractions. Seneca (approximately B.C. 4-A.D. 65) favored visual teaching on the ground that men believe visual perceptions above all others. Quintilian (approximately A.D. 35-100) recognized that interest helps a child to absorb knowledge, and he conceived of teaching the alphabet with the aid of blocks.[3]

The thing that is called a motion picture, which is not a picture of motion at all, has been in existence for countless ages. That is, the principle of the motion picture has been known to mankind for three or four thousand years. Historical records indicate that in ancient China there were devices which produced the effect of motion perceptible to the eye. Even in formalized education visual aids have been used for centuries. Sand,

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[2] Ellwood P. Cubberley, History of Education (New York: Houghton Mifflin Company, 1920), p. 59.

[3] John S. Carroll, Teacher Education and Visual Education For the Modern School (San Diego: Office of the Superintendent of Schools, 1948), p. 9.

boards, and slate, on which marks were made and diagrams were drawn, were predecessors of the modern blackboard.

During the middle ages (440-1400) the church used frescoes, statues, carvings, and marionettes to teach its religious lessons to the people.

During the Renaissance (14th-16th centuries) puppets were used in popular instruction and entertainment. Art again became important. With the invention of printing, use of visual aids continued in the form of woodcuts, etchings and engravings.[4]

The first illustrated schoolbooks appeared about 1460 shortly after the invention of movable metal type. Early illustrations were copied from old manuscripts and were transferred to woodcuts which could be used in the simple printing process of that time. However, with copying and recopying, the pictures became less representative of their original meaning, so by 1500 artists began drawing directly from nature for the woodcuts. Among the early textbooks were DER EDELSTEIN, 1416, a collection of fables with 101 woodcuts; AESOP, issued a few years later, with 200 pictures; Ptolemy's COSMOGRAPHIA, 1478, with maps; Braydenbach's PILGRIMAGE, 1478, a famous travel book containing many pictures; ALGORITHMUS LINEALIS, 1488, with illustrations of commercial customs and exchange, geometric diagrams, tables and examples of arithmetical operations; PICTAGORIS ARITHMETRICE INTRODUCTOR, 1491, with thirty-nine illustrated problems; and SUMMA, about 1491, showing thirty-six positions of the fingers and the hands to illustrate finger symbolism of numbers. The first printed Euclid had

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[4]Ibid., p. 10.

420 diagrams in the margins.[5] Music books of the time included music scores and pictures. Other early well illustrated books were the NOVAE THEORICAE PLANETARUM (1537) of Georgius Peurbach, and the PHILOSOPHIA NATURALIS (1654) of Henri Regius.[6]

II. 17TH TO EARLY 20TH CENTURIES

About the Seventeenth Century there appeared to develop a widespread, conscious and planned effort to render programs of instruction more concrete. In this period John Amos Comenius (1592-1670) became known as an advocate of concrete aids to learning and supported his contentions with one of the best known of early, well illustrated textbooks, THE ORBIS PICTUS (1658), sometimes considered as marking the beginning of visual education.[7] With the invention of photography by Niepce and Daguerre in the early Nineteenth Century and the development of modern engraving processes, the possibilities of utilizing illustrative materials in books and other forms for class room purposes multiplied many times.[8]

Other educators concerned themselves with the problem of how to make the work of the school meaningful. This was the central problem attacked by Erasmus (approximately 1466-1536), Locke (1632-1704), Comenius, Pestalozzi (1746-1827), Herbart (1776-1841), and John Dewey. The fundamentals of using concrete aids to learning were discussed in

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[5]Alexander B. Howard, Jr., "Text Book Illustration: A Visual Aid," Educational Screen, XXVI (January, 1947), pp. 27-28.

[6]Mason M. Brien,"Notes on the Historical Background of Visual Education," Educational Screen, XX (February, 1941), pp. 61 and 321-325.

[7]Carroll, op. cit., p. 10.

[8]Harry C. McKnown and Alvin B. Roberts, Audio-Visual Aids to Instruction (New York: McGraw-Hill Book Company, Inc., 1940), p. 5.

the works of Rousseau (1712-1778), Pestalozzi, Froebel (1782-1852), Herbart and others of the early pioneers in education, many of whom stressed the field trip or "learn from nature" ideas. Colone Parker (1837-1902) included use of the field trip in the program of his Chicago school.[9]

Elby, in THE DEVELOPMENT OF MODERN EDUCATION, traces the relationships between several aspects of the object teaching movement, and activity which has since been known as visual education, in some detail all the way from the procedures used by Pestalozzi in Switzerland to the related work of Dr. Charles Mayo and his sister Elizabeth in England and thence to the object lesson procedure used in Toronto, Canada. The indirect effect of this chain of circumstances is then stated by Eby to be seen in Oswego Movement.

The Oswego Movement. Superintendent Edward A. Sheldon (1823-1897) of the Oswego Public Schools became an enthusiast in the nature study phase of the object teaching method, about 1860, partly as a result of his study of the object teaching methods being used in Toronto. Consequently, the nature study field trip was used at Oswego and other related object teaching methods were utilized. Many of the people trained at Oswego Normal School by Sheldon and Hermann Krusi, son of Pestalozzi's assistant, who worked with Sheldon, moved into the midwest for teaching work. Their application of what they learned at Oswego probably has had a far-reaching effect. Eby evaluates the Oswego movement as follows:

> With this new and vital idea, Oswego became the hot-bed of educational progress. The enthusiasm of its students was boundless, and the new method was carried by them to all parts of the country.[10]

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[9] Carroll, loc. cit.

[10] Ibid., pp. 10-11.

Important though such large movements are in the development of visual education, the significance of the smaller, scattered, individual contributions is not to be minimized. An example of such a contribution is found in an exposition on visual education in this country in a bulletin of the "Pantographic Academy," issued in Philadelphia in 1852. The author of the bulletin states, "one of the most important principles upon which our system (of pantographic instruction) is based, is that of exhibiting to the eye that which we wish to have impressed upon the mind, and consequently fixed in the memory." Methods emphasized were graphic illustrations, advantages of visual association and systematic arrangements.[11]

In more recent years from the very earliest attempts to use visual instruction, the history of science records scattered references to various attempts at recording and reproducing sound by mechanical means, and at producing pictures of articles in motion and reproducing those pictures.

In 1894 at an exhibition open to the New York public, Thomas Edison exhibited a strange machine called the Kinetoscope, in competition with another instrument, the magic lantern which projected a fixed image upon a screen for all the group to see. The Kinetoscope actually gave motion to one image projected upon an internal screen, but the image could be viewed only by the individual.[12]

While Edison is usually credited with the invention of the first workable motion picture; but, while as a result of his first public

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[11] A Brief Exposition of the Pantographic System of Instruction. Philadelphia: Privately Published, 1852, p. 12.

[12] McKnown, op. cit., p. 6.

exhibition hundreds of these machines were sold, his contribution was largely a refinement of the earlier work of such men as E. J. Marey and Edward Maybridge. These latter named men secured the first sequence of still pictures in 1872 at Palo Alto, California. Their sequence is the composite traced at split-second intervals of the movements of a race horse as it moved down a track and tripped the thread shutters of twenty-four cameras placed along the adjacent railing.[13]

The results of Edison's experiments were not entirely staisfactory and early motion pictures were thought by him to have no great commercial or educational possibilities. A group of small but enterprising merchants and peep-show operators had a different opinion. The motion picture industry as a commercial venture began with the opening of the first peep-show in New York in 1894, and the first nickelodeon was open at the end of the century.[14] These, and other developments, were the forerunners of the great motion picture industry of today. In a single generation the motion picture had a world audience in the neighborhood of 250,000,000 people.[15]

There have been many minor and numerous major experiments in the field of visual training and in the development and improvement of visual and audio-visual aids during the first twenty-five years of the Twentieth Century. Visual aids of different kinds were emphasized and school systems began to organize specific means of distribution and utilization. Among these school systems to name a few, were Boston, New York, Philadelphia and Chicago

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[13] Don C. Ellis and Laura Thornborough, Motion Pictures in Education (New York: The Thomas Y. Crowell Company, 1923), p. 3.

[14] Struck, op. cit., p. 245.

[15] John Glover and William B. Cornell, The Development of American Industries (New York: Prentice-Hall, Inc., 1933) pp. 745-761.

schools.[16] With variable success, the several movements included in this period resulted in the accomplishment of valuable groundwork and stimulated interest in use of visuals on the part of school people throughout the country.

The first intensive application of the motion picture to educational procedure was made immediately before and during World War I, largely for propoganda and general training purposes.[17] Motion pictures were found to be so valuable during the period, that the close of the war brought into existence many types of educational films and film producers.

Other developments of visual and audio-visual aids included the film strips in 1920, radio recordings in 1923, 16 millimeter silent film in 1924, and 35 millimeter sound film in 1926, the 16 millimeter sound film in 1927, and disc recorders and sound systems in 1930. According to Dent, all of the above dates are only approximate.[18]

III. RECENT DEVELOPMENTS

Since the start of World War II, the development of visual and auditory aids has surpassed that of any previous period. Faced with the urgent necessity of training millions of men in multitudinous technical skills and of upbuilding their morale under the dire stresses of war by touching both their emotions and their understandings, the wartime United States Army and

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[16] Carroll, op. cit., p. 12.

[17] Ellsworth C. Dent, The Audio-Visual Handbook (Chicago: Society for Visual Education, Inc., 1946), p. 103.

[18] Ibid., pp. 18-21.

Navy resorted to an unprecedented development and use of visual, auditory and tactile aids in myriad forms. Two factors -- centralized agencies of production and distribution and ingenuity in local improvisation -- contributed to the end result of increased and improved use of visuals. The armed forces use of visual methods in wartime training programs constituted an important step in the development of visual education for at least two reasons. One reason is that the training programs were in themselves a vast demonstration laboratory for visual and auditory methods, yielding information about visual techniques and further justifying their use. Another reason is that certain spectacular aspects of the program, described enthusiastically, almost sensationally by some writers and speakers, have brought visual education to wider public attention. The armed forces made effective use of what was already known about visual methods by civilian educators interested in the field. In addition the Army and Navy conducted widespread research in the development and use of training aids. Furthermore, wherever possible the armed forces assigned to training activities a nucleus of reservists with civilian background in educational methods. Consequently, this gave educators an opportunity to show what could be done with visual education methods when they were given adequate finances, proper equipment, trained personnel, and freedom to organize an ambitious program.

The wartime emphasis on visual education caused many organizations and individuals to enter the visual field to take advantage of what they believed would be a profitable market. The production of education films by the Office of War Information, the Treasury Department, the Department of Agriculture, the Office of Inter-American Affairs, and the armed forces

apparently suggested to many commercial concerns the peacetime possibilities in this field for private enterprise. One new venture in the field was the production and distribution of motion pictures and filmstrips specially prepared to correlate with particular textbooks, as exemplified by the work of the McGraw-Hill Book Company. Selected parts of each textbook were supplemented by a series of motion pictures and filmstrips. Row, Peterson and Company and Silver Burdett, along with the Society for Visual Education produced slide films to accompany certain textbooks. Other firms, like The American Book Company and Encyclopedia Britannica Films, Inc., are important in the field of visual education partly because their approach to production of visual materials is educational as well as commercial.[19] One trend in visual education was the increased production or sponsorship of visual materials by business concerns unrelated to the field. All these developments show an activity in the commercial area of visual education which suggests that the teacher has available a large source of materials and assistance to be made use of.

Since the World War II there has been a tremendous expansion in visual and auditory fields. Signs of rapid growth appear in the upsurge of local, state, national, and international organizations, in textbooks and periodicals, in audio-visual department in local school systems, and in research studies with this subject. The auditory and visual movement in education has grown to a point where an estimated 20 million dollars per year is spent on materials, equipment and services exclusive of salaries. The accelerating

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[19] Carroll, op. cit., pp. 87-94.

rate of research in the visual and auditory instructions in the past decade is seen in the 320 references given on this subject in the 1960 edition of the ENCYCLOPEDIA OF EDUCATIONAL RESEARCH: the 1950 edition having contained only 120 references. Most of the listed sources represent major research studies, largely supported by grants from agencies, philanthropic funds like Ford Foundation, and the military services.[20] A majority of the research studies conducted were in the field of television, motion picture and sound film slides. The rapid developments of television, broadcasting and reception since regular service was inaugurated by the National Broadcasting Company at the opening of the New York World's Fair in May, 1939, have made this new electronic art the center of attention and speculation. Another comparatively recent development in the sound field is a combination of radio reception, sound reception, amplification and distribution that came into use in 1938. Tape and wire recorders and Vectograph slides were produced in 1943. There have been major improvements in facsimile, sound motion picture projectors, sound film slides, and many other aids since that time.[21] Summing it up in a few words, visual communication media, such as television, radio, sound motion picture and sound film slides, have made a major contribution to all forms of training since the beginning of World War II. In the post-war period there have been mechanical improvements and achievements in the techniques of production and utilization of all aides.

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[20] Gene C. Fusco, "Technology in the Classroom Challenges to the School Administrator,: reprint from School Life, (March, May, 1960)., p. 2.

[21] Dent, op. cit., p. 171.

Approximately 6,000,000 television sets were produced in the year 1960, as against nil in the year 1930. About 15,000,000 radio sets were produced in 1960 as against 3,827,800 in the year 1930.[22] Nearly 600 school districts are currently making regular use of televised instruction as compared to 1955 when only about a half dozen schools were doing so.[23] During the eight year period, 1946-1954, the use of filmstrips, sound film, and disk recordings increased by approximately 300 percent.[24] Today newspaper circulation is more than 45,000,000. There are 8000 weekly, monthly and quarterly magazines appearing in the United States indicating the increased trend in use of mass media.[25]

Auditory and visual aids are being distributed by manufacturers, producers, processors, distributors, service groups, local school, colleges and universities, federal government departments and agencies, state government departments, libraries, churches, museums, associations and commercial dealers throughout the country. Today 305 agencies mainly Colleges, Universities, and State agencies maintain audio-visual aid libraries. There are about 104 public libraries which provide audio-visual aid services. Apart from this, American Red Cross, Air Force, Bureau of Mines, Bureau of Prisons, Bureau of Reclamation, Children's Bureau, Civil Aeronautics Administration, Coast Guard, Department of Agriculture, Department of Commerce, Farm Credit Administration, Federal Security Agency, Geological Survey, Institute

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[22] Harry Hansen (ed.), The World Almanac and Book of Facts for 1961 (New York: World Telegram and The Sun Newspaper, 1961), pp. 694.

[23] Fusco, op. cit., p.3.

[24] Walter A. Wittich and Charles F. Schuller, Audio-Visual Materials Their Nature and Use (New York: Harper and Brothers, 1957), pp. XIX.

[25] Ibid., p. 5.

of Inter-American Affairs, Library of Congress, Marine Corps, Maritime Commission, Navy Department, Office of Education, Office of Indian Affairs, Office of War Information, Pan American Union, Public Health Service, Savings Bonds Division, Secret Service, Soil Conservation Service, Tennessee Valley Authority, United Nations and the Veterans' Administration, distribute films as well other visual materials to responsible organizations and persons, through loan or purchase.[26]

World War II brought massive research in many aspects of the behavioral sciences. The effectiveness of various types of training and orientation materials, the process of attitude change and formation, the whole concept of "Psychological warfare" - all were prime areas for exploratory investigations, and there were more than 9 million subjects at hand under more tightly controlled conditions than ever possible in civilian life. The elaborate series of studies called "The American Soldier" (2) was only one of the results, but, even taken alone, it provided solid evidence of the dimensions and usefulness of behavioral research. Much of it is devoted to the communication area. On the commercial side, the major radio-television networks, most major magazine publishers and a few newspaper publishers now maintain regular research departments. Research is also carried on at Universities which have established special divisions of communication study since the war, including Stanford, Michigan State University, the Massachusetts Institute of Technology, Columbia University and the University of Illinois,

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[26]Kenneth B. Haas and Harry Q. Packer, Preparation and Use of Audio-Visual Aids (New York: Prentice-Hall, Inc., 1955) pp. 329-361.

Elaborate programs also have been developed in various university departments of psychology, political science and journalism.[27]

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[27] National Education Association of the United States, Mass Communication and Education, A report prepared by the Educational Policies Commission (Washington, D. C. National Education Association of the United States, 1958), pp. 46-47.

CHAPTER III

DEVELOPMENT OF A THEORY OF COMMUNICATION FOR VISUAL INSTRUCTION

The world has never seen a time when the role of the communicator was more important. This is so because there has never been a time when there was so much to know, so many people who need to know it, and so great a need for them to learn it so quickly. Certainly, in the newly developing countries, and the old established ones as well nothing can be of more lasting importance than the transfer of useful ideas from one person to another. In the wise use of the process of effective communication lies the potential for millions of people in the so-called under developed countries to overcome ignorance, poverty and disease, and to attain their goal of economic and social well-being.

I. THE COMMUNICATION PROCESS

The over riding challenge to extension educators is to select and present ideas useful to an audience, to make their meaning clear, to get the ideas accepted, and to motivate people to adopt and practice them. To a large degree the success of an extension worker is determined by his ability to communicate good ideas to others. To those who would go out and work effectively in the field of extension education, the central challenge is to help rural people put useful knowledge to work for them. This requires effective communication.

Extension educators as communicators, scientists as discoverers of truth, and administrators as managers of programs form a team that must be

cast in the forefront of all development schemes in extension work. The scientist uncovers basic knowledge, the extension educator creates methods for communicating it to people and the administrator provides conditions that enable both the scientist and the communicator to play their roles effectively.

In a knowledge of technology lies the content an extension educator must communicate to people. In a knowledge of the extension educational process lies the foundation upon which he must build effective plans for communicating technology useful in attaining the goals of economic and social advancement of people. In a broad sense, the extension educator derives from his knowledge of technology and extension processes, the principles and content from which he synthesizes a system of communication to achieve educational objectives. Hence, the extension worker as a communicator is the member of the team who creatively adapts the findings of science to the needs of people and devises communication schemes that enable them to understand technology and to put it to work. The communicator, the scientist, and the administrator can be, therefore, central actors in the modern drama of the uplift of rural people. Working together in many countries, they have helped rural people make great strides toward a more satisfying life. Potentially, under proper conditions, they can help people in developing countries create a society whose basic needs are met.[1]

Communication is the process of transfer of ideas, facts, feelings, or impressions between two or more people in ways that each gains a common

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[1] J. Paul Leagens, The Communication Process In Rural Development, A report for the Comparative Extension Education Seminar, Mimeo Release No. 6 (Ithaca, New York: University ob Cornell, 1961), p. 2.

understanding of the meaning, intent and use of messages. The term "communication" stems from the Latin word "communis" -- meaning common. Communication, then, is a conscious attempt to share information, ideas, attitudes and the like with others. In essence it is the act of getting a sender and a receiver "tuned together" for a particular message, or a series of messages. Effective communication, therefore, is the essence of effective extension teaching. One cannot teach if he cannot communicate.[2]

Communication is essential to all human association. One's ability to influence others is closely linked with his ability to communicate his ideas. The essence of learning is to gain the meaning of new ideas in relation to recognized problems. For two or more people to engage in a common, cooperative effort, they must first be able to communicate with each other. To strive toward common goals, they must have a body of common knowledge and ideas.

Good communication does not consist merely of giving orders, but also of creating understanding. It does not consist merely of imparting knowledge, but also of helping people gain a clear view of the meaning of the knowledge. Progress in the future will stem largely from better technology and greater skill in communicating it to others. Economic and social change will only occur to large numbers of people when staff workers have effectively communicated useful ideas to them in ways that the ideas are understood and put to use. Much misunderstanding results from faulty

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[2] Ibid., p. 3.

communication. Too many people saying the wrong things, at the wrong times, in the wrong ways, to the wrong people, may hinder progress. What is needed is more people saying the right things, at the right time, in the right way, to the right people. This is the formula for effective communication.[3]

One can stumble only when he is in motion. But this key fact of motion is often overlooked in communication. Communication is a process. Process is an act of proceeding, a series of actions or operations definitely leading to a desired end. Each episode of communication has at least three phases: (1) expression, (2) interpretation, and (3) response. What these are is the crucial point in communication. If the expression is not clear, the interpretation accurate, and the response proper, one's effort to communicate will not succeed. It is one thing to expose ideas, even to get information to people, but quite another to get ideas widely interpreted as intended and responded to as desired. In short, it is easy to control what one's expressions say or mean, but difficult to control how an audience interprets and responds to them.[4]

The primary purpose of communication in extension education is to achieve learning that results in desirable changes in people's behaviour. In educational programs of this type it is assumed that people will continue their present ways of thinking and doing until they have new learning experiences that cause them to reject present, undesirable modes of behaviour and, adopt new improved ones. Also, research has indicated that some form of

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[3] Ibid.

[4] Ibid., p. 4.

incentive may be used to cause people to accept new modes of thinking and acting specified for a program. It is desirable for the person to recognize the greater advantage to adoption of recommended modes of behaviour than provided for continuation of his present ones. In this context, the crucial task of communication in programs of change is to offer strong incentives for change to people who need to make changes in their way of living. Success at this task requires both a thorough understanding of the principles and elements of communication and a high level of skill in their use on the part of all extension workers for the optimum development of rural farm people.

Successful communication in extension education requires a skillful communicator sending a useful message, through proper channels, effectively presented, to an appropriate audience, that responds as desired. The communication task thus consists of skillful handling of these six key elements.[5]

II. THE COMMUNICATION MODEL

The concern with communication has produced many attempts over the years to develop models of the process, including descriptions and statements of elements. Of course these models differ to varying degrees. The communication models come in a variety of forms, including the written, the mathematical expression, or the non-verbal visualization. They may be oriented for the purpose of solving different problems. They may be

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[5] Ibid., p. 9.

designed so as to explain the transmission of information over mechanical systems, to explain the social nature of human communication, to express the neurological function of the brain or to predict message form and structure.

Communication models can be placed in several kinds of dimensions. In each case, the dimension chosen is one which fits a particular situation under study. Thus, a model might be constructed to emphasize the psychological aspects of communication. Other common models seem to be derived for the purpose of explaining the communication in small groups, the relationship between the newspaper and the mass audience, the communication in a polarized speaker-audience situation, or a diagram of the process nature of communication.

Regardless of the purposes for which communication models are constructed, at least two things are clear; first, they are made for particular purposes (for example, to serve a criterion of utility), and second, they probably never include all possible elements of the communication process as it actually exists in the real world. People who formulate models are quite selective, and they pick the elements for their models which seem to occur within the process of communication in such a way as to fit the particular situation being examined.[6]

Perhaps the best known verbal model of communication is also the oldest. Aristotle, writing in his Rhetorica 300 years before the beginning

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[6] Erwin P. Bettinghaus, "Communication Models," Research, Principles, and Practices in Visual Communication (East Lansing: National Project in Agricultural Communications, 1960), p. 17.

of the Christian Centuries, provided an explanation of oral communication which is still worthy of attention. He called the study of communication "rhetoric" and spoke of three elements within the process:

> Rhetoric falls into three divisions, determined by the three classes of listeners to speeches. For of the three elements in speech-making -- speaker, subject and person addressed -- it is the last one, the hearer, that determines the speech's end and object.[7]

From an analysis of the three elements of speaker, speech, and audience, Aristotle details the characteristics which each element might have. His is an audience-centered exposition which attempts to place the emphasis in communication on persuasion.

Most of the current communication models are similar to Aristotle's, but one major difference seems apparent. Aristotle did not talk about a channel for communication as do most modern accounts. Yet the Rhetorica rather carefully examines many of the factors which make for effective oral or written communication. In its emphasis on the listener, Aristotle originates a philosophy of communication carried out in the SMCR model discussed later in this chapter.

The SMCR Model, developed by David K. Berlo and used in training programs of the National Project in Agricultural Communications, emphasizes the psychological nature of communication as it affects both the source and the receiver in any communication situation. Although other models have also emphasized the psychological nature of communication, the SMCR model has the special characteristics of providing an analysis of messages and of sensory channels in communication.[8]

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[7] Ibid.

[8] Erwin P. Bettinghaus, "The S-M-C-R Model of Communication," Research, Principles, and Practices in Visual Communication (East Lansing: National Project in Agricultural Communications, 1960), p. 29.

Essentially, this model (Fig. 1) attempts to portray the necessary ingredients for human communication. The model has been used in the teaching situation to improve understanding of the communication process, as well as to help students or workshop participants improve their ability to understand others or to have others understand themselves. With slight additions, the model has been used in a number of instances to analyze various kinds of communication breakdowns. With these uses in mind and because it has general acceptance by most communication theorists, Source-Message-Channel-Receiver model of the communication process or S-M-C-R Model as it will be referred to throughout the remainder of the text of this thesis, is chosen and used in this study.

The following Bettinghaus type outline will be presented in order to further explain factors which must be considered in the study of the S-M-C-R Model.

1. The Source (S).

   A. All communication involves a Source (S) of information. This is the first factor in the model. All communication must emanate from some (S).

      1. The (S) might be a single person.

      2. The (S) might be a group of people (e.g. - an institution like the University of Tennessee.)

   B. There are factors which determine how the (S) will operate in the communication process. The S-M-C-R Model provides a minimum list of significant variables which should be applicable to most of the kinds of communication situations to be encountered.

      1. The communication skills of different sources: the abilities to think, write, draw, speak, and reason.

      2. The (S)'s attitudes toward:

         a. his audience
         b. the subject about which he is communicating
         c. the channel of communication
         d. himself.

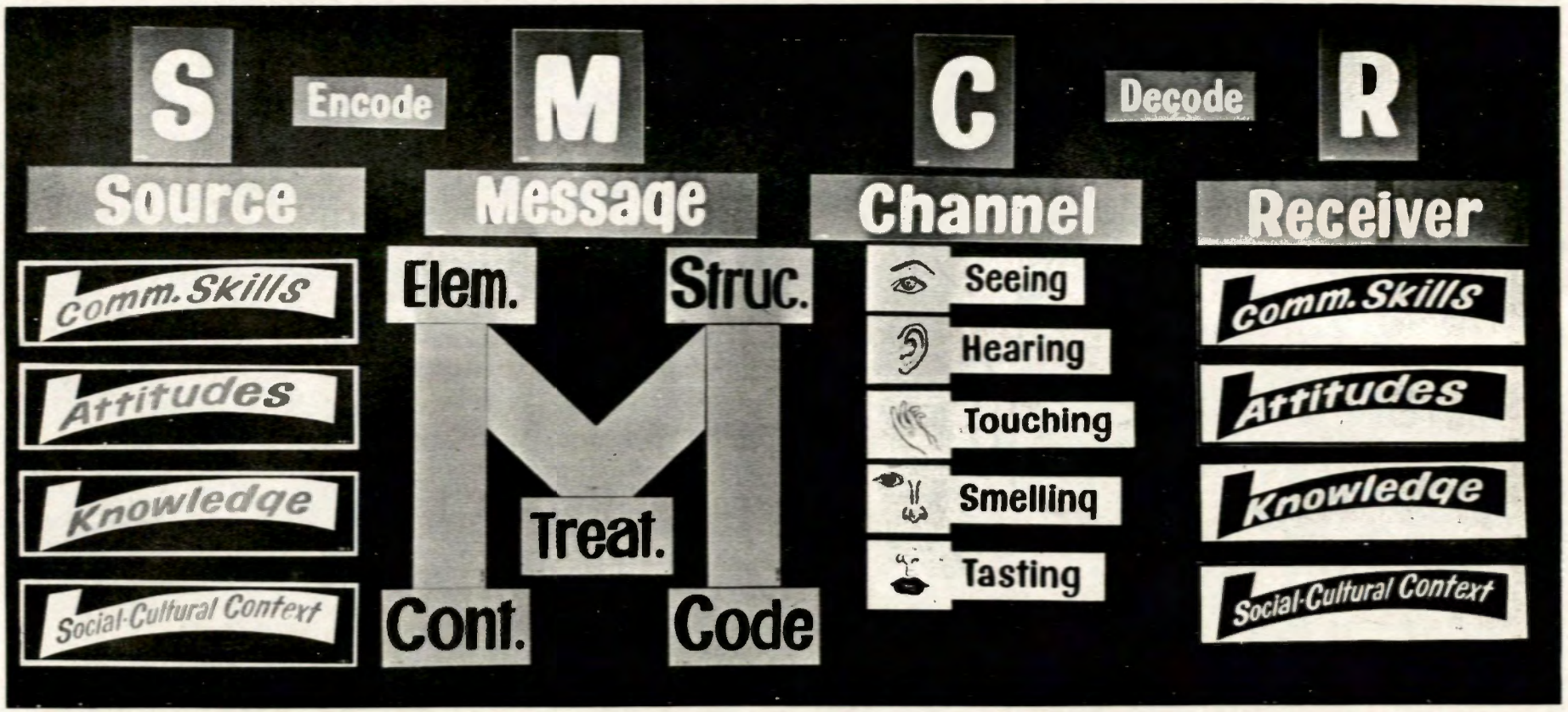


Figure 1. Source-Message-Channel-Receiver Communication Model.

3. The (S)'s knowledge about:

   a. his subject matter
   b. his audience
   c. the situation in which communication is taking place
   d. the process of communication.

4. The Socio-cultural context in which the (S) and his receivers are living, including:

   a. what his role is
   b. what groups he belong to
   c. who his friends are
   d. what his social background is.

In the communication process, then, we begin with a source (S), someone who starts things going even though we must remember that many things condition how the, (S) will communicate. Communicators should examine themselves as sources of communication, and they should evaluate communication that they receive in light of what they know about its source.

II. The Message (M).

A. The (M) in communication, the second important factor in the model, has a number of sub-elements which need to be considered.

   1. The specific code has to be chosen.

      a. A given language may be selected.

         1. The so-called natural languages include such tongues as: Spanish, German, English, and Hindi.

         2. Other kinds of languages include such forms as: music, art, and gestures.

      b. It can be looked at in terms of a level of difficulty of the code for the audience.

   2. The content of the (M) must be selected and organized, including the following steps:

      a. ideas to be presented need to be isolated
      b. ideas need to be tested.
      c. support should be selected and tested.
      d. the ideas and support should be properly arranged.

3. Appropriate treatment of the (M) has to be decided upon, including:

   a. the selection of a code appropriate to the receiver, the content of the message and the medium of transmission.

   b. the arrangement of sentences, the difficulty level of the written material and the appearance of the final product.

B. Within each sub-factor, two things need to be considered.

1. The basic elements of code, content and treatment.

2. The particular way in which the elements are structured, or arranged. When a particular source has created a message, he has to decide what channel he will use to present this message; i. e., what medium (or media) of communication will be most effective. This, then, is the third factor of the model.

III. The Channel (C).

A. There are several ways in which (C) may be viewed. The model shows only one of those ways. It suggests that a useful way of approaching the study of the communication process is to consider (C) to consist of the five main senses. In other words, the channels of communication are ways of presenting a message so that

1. It can be seen.
2. It can be heard.
3. It can be touched.
4. It can be smelled.
5. It can be tasted.

B. Each of the following broader kinds of channels may be analyzed under the five senses listed above.

1. Newspapers, magazines and books -- seen and heard.
2. Television and motion pictures -- seen and heard.
3. Public speech, discussion and interviewing -- seen and heard.
4. Radio and recording -- heard.
5. Demonstrations and on-the job-training -- touched etc.
6. Commercial agricultural edible products -- tasted, etc.

C. Generally communication is more effective when a larger number of channels is used (i.e., when more senses are stimulated.)

D. Generally, communication is more effective when the senses are stimulated relatively more directly and immediately.

E. As channel intensity and number increase , the potential audience size usually decreases. In other words, it might be suggested as a general rule (with many exceptions,) that use of multiple channels, with high intensity, tends to produce maximum effects on fewer persons. On the other hand, a single channel, with low intensity, tends to produce maximum effects on larger groups of people.

IV. The Receiver (R).

The final link in the communication process is the receiver -- the person or persons on the other end of the process from the source. All of the factors that operate on the source operate equally on (R). The list of factors are given below.

A. All communications must end with some (R).

1. The (R) might be a single person.

2. The (R) might be a group of people (e.g. - even a large organization like the National Farm Bureau.)

B. There are things which determine how (R) will operate in the communication process.

1. The communication skills of (R): the decoding skills of reading, listening, thinking and writing.

2. The attitudes of (R). It can be said that the closer the match between the attitudes of the source and the attitudes of (R), the more effective will be the communication.

3. The knowledge of (R) is obviously important. The receiver placed in a communication situation involving a completely new subject usually behaves quite differently from one entering a relatively familiar situation.

4. The Socio-cultural context in which (R) is living.

The S-M-C-R Model differs from all other models in that it emphasizes the overall, complete process of communication, and deals with (S) and the (R) as only two elements in the communication process. There are two other words in the model which have not yet been defined. Discussion of these terms should facilitate a more complete understanding of the process. The communication process always involves (S) who or which encodes, processes,

an (M) for transfer along some (C) to be decoded, interpreted, by (R). The S-M-C-R Model should be useful for gaining some initial understanding of the process of human communication. However, it should not be used without the consideration of some precautionary measures designed to prevent certain misunderstandings. First, for example, the model does not indicate the purposive nature of human communication. A second caution involves the nature of communication as a process. As the visual model is shown, it may appear to the casual observer that communication is a linear process, perhaps even a step-by-step process, always going in one direction. Yet it should be known that communication situations are seldom one-way. Teachers of communication would do well to emphasize that communication does not occur as simply as the visualization presented in Figure 1 would seem to indicate that it does. The communication process, like all other processes, is dynamic, occuring in more than one direction, being ongoing, and ever changing.[9]

The above discussion might be summarized by a sentence of Harold Lasswell's much-quoted formulation of the main elements of communication: "Who says What in which Channel to Whom with what effect?"[10] The sentence can be further explained in detail as: Who, is the (S); What, is the (M); in which Channels, is the (C); to whom is the (R), and, with what effect is measurement of progress made toward goals set at the beginning by the (S).

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[9]Ibid., p. 29-32.

[10]Erwin P. Bettinghaus, "Communication Models," Research, Principles, and Practices in Visual Communication (East Lansing: National Project in Agricultural Communications, 1960), p. 17.

III. GOALS OF VISUAL COMMUNICATION

The goals of the communication process can be specified, and even classified, in a number of ways. No one of these methods of categorization apparently has any more intrinsic validity than any other. However, since psychological research deals with categories of behavioural events such as learning in general, or even particular kinds of learning, it seems reasonable to try to classify the goals of the communication process in such a way that more communicators might better be able to make more direct use of the research findings. A research classification scheme is needed because in planning a particular piece of visual communication, the kind of learning that is involved has got to be identified so that the psychological principles applicable to a particular problem which is dealt with can be known. While remaining consistent with the usual research categories (e.g. - serial learning and perceptual learning,) the classification scheme should at the same time be usable by those who are interested primarily in visual communication, and not in psychological research. In accordance with these criteria, the goals of visual communication may be classified under the following four headings:

(a) to motivate people

(b) to convey facts

(c) to explain something

(d) to teach a perceptual motor skill.[11]

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[11] John Oliver Cook, "Research in Audio-Visual Communication," Research, Principles, and Practices in Visual Communication, (East Lansing: National Project in Agricultural Communications, 1960), p. 103.

These communication tasks need to be coordinated in a meaningful fashion with the categories that the psychologist uses in studying behaviour, particularly learning behaviour, since all of these four communication problems are included in the psychology of learning.

Motivating People

The concept of motivation involves a pattern of personal activity which may be described as:

1. a desire, urge, or less conscious need of the individual for a condition or state, physical or psychological, which will result in at least temporary satisfaction, adjustment, or relief of the need (or needs) aroused.

2. the identification of a course of action, precise or vague, as a possible means of achieving or eliminating a threat to the achievement of satisfaction of the aroused need.

3. the release of energy into channels of behaviour patterned in accordance with course of action chosen as the means of satisfying the need.[12]

At the core of all motivation is the self, or person, and the need of the individual to satisfy urges. There are four basic motivations of human conduct:

1. self-preservation -- biological or physical needs.

2. self-realization -- satisfaction of the ego by means of achievement, group recognition and affection.

3. self-identification -- achieved through sympathy ("feeling with," or sharing the reactions and responses of a group or another person), or through empathy ("feeling into," or projecting one-self into a situation, another person, or group)

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[12] Charles F. Hoban, Jr. and Edward B. Van Ormer, Instructional Film Research 1918-1950 (Rapid Mass Learning) Technical Report No. SDC 269-7-19, (Port Washington: Special Devices Center, 1951,) p. 51.

4. self-regard -- the maintenance of self-respect.

One or more of these above needs may lead to co-operative and helpful behaviour of an altruistic nature. Each individual lives to a great extent in his private world of perceptual experiences, concepts, feelings, urges, attitudes and values. His life consists of the development of his private world and his expansion of the meaning of, and means for, satisfying the above needs. When these needs are satisfied in harmony, the individual is well integrated and psychologically healthy. If these needs are not satisfied in harmony with each other, the individual experiences conflict and varying degrees of maladjustment.[13]

Everyone concedes the importance of motivation, but no one seems to know much about how to manipulate it to the advantage of the learning process. On most of the issues in this area the experimental findings to date are decidedly ambiguous. They suggest rather strongly that the motivational variable is of some importance in the visual and auditory demonstrations, but they indicate with equal conviction that we are still in the dark about how to use it.[14]

The Interest and "Liking" Factor. One issue that seems to be fairly well settled is that whether one likes a visual or an auditory demonstration, or whether one is interested in it for its own sake, is not related to the amount one learns from it. Experiments conducted on films by Vandermeer, 1950, Twyford, 1951, and May and Lumsdaine, 1958, suggest several conclusions: (1) interest in a film is not the same as interest

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[13] Ibid.

[14] Cook, op. cit., p. 92.

in the subject matter of that film; (2) the amount of interest in a film does not predict the amount that will be learned from it; and (3) as a rule, technical slickness does not increase the amount learned from a film.[15]

Extrinsic motivation. In extrinsic motivation the incentive or goal is artificially introduced into the situation; the motivation is not an original function of the material to be learned or of the learner's attitude toward it. In extrinsic motivation the drive is to attain or to avoid an incentive apart from the activity itself; the incentive may be an immediate or a remote goal, which is extraneous to the activity and which may or may not be related to it. A monetary reward for success in learning is an example of an immediate goal that is unrelated and extraneous so far as the learning activity is concerned. "Graduation" from high school, to which end a pupil may be encouraged to complete courses distasteful to him is an example of a more remote goal, also extraneous to the learning activity, but directly related to it.[16] Rivalry and competition may be used. The teacher's personality, desire for his approval and liking for the teacher will be found to have an influence on learning. Negative extrinsic motives are sarcasm, ridicule and punishment, each of which is effective and detrimental. Scores of experimental investigations of the effects of various extrinsic motivations show a variety of results.[17] The number of studies is so large and covers

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[15] Ibid.

[16] David G. Ryans, "Motivation in Learning," The Physchology of Learning, Forty-first year book of the National Society for the Study of Education, Part II (Bloomington, Illinois: The University of Chicago Press, 1942), pp. 296-297.

[17] William H. Burton, The Guidance of Learning Activities (New York: Appleton-Century-Crofts, Inc., 1952), p. 70.

so many variations of the common devices that a sampling will not be given here. Experiments using each extrinsic motivators as praise, reproof and announcing that a test will be given at the conclusion of the visual and auditory demonstrations have yielded somewhat contradictory results.[18]

Motivational Effects Upon Subsequent Behaviour. While something is known about the effects of visual or auditory demonstrations upon the amount learned from the demonstrations, little is known about its motivational effects that the demonstrations may have on subsequent behaviour. The scanty experiments conducted by May and Lumsdaine, 1958, and Vandermeer, 1950, do suggest that visual and auditory demonstrations might have some fairly long-lasting motivational effects, but too little is known about motivation in this area to predict consistent effectiveness in its use.[19]

The above details outline what is currently known about the role of motivation variable in visual and auditory learning, and about the effect of visual and auditory demonstrations, chiefly films, in motivating subsequent behaviour. At this point, it might be worthwhile to make a distinction between, on the one hand, teaching somebody something that he is eager to learn, and, on the other hand, getting him to do something that he knows how to do but is not doing. Motivational tasks can be further analyzed into two types: (1) motivating someone to do something, and (2) motivating someone not to do something. In the case of the former type, if the person can be induced to perform the response once, then, if

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[18]Cook, loc. cit.,

[19]Ibid., p. 93.

he is adequately rewarded, this should strengthen his tendency to repeat the response. Hence, in this case, reward would seem to be a key variable. But the case of teaching some one not to do something is a horse of a different color and is one of the chief problems in teaching safety precautions, since so many of them are prohibitions.[20]

Conveying Facts

There are certain important principles to be observed in the communication of facts. They are generally referred to in the following terms:

1. Organization of the material
2. the bowed serial position curve
3. the von Restorff phenomenon
4. paired-associate learning
5. non-interference in paired learning
6. contiguity in associated learning
7. mnemonic devices.

Further discussions will be made of each of the following principles for greater clarification.

Organizing the material: Apart from any purpose in communicating facts, the facts themselves may be either related to each other or unrelated, for example, a list of names or book titles. Tasks of this kind are called serial learning tasks. Though the names can be presented in any order, they

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[20] Ibid., p. 103.

have to be presented in some order, and the extent to which the names are noted, learned, or remembered depends in part upon the order in which they are presented. Since organized material is easier to learn and retain than unorganized material, it would be desirable to impose some sort of structure upon the facts, to order them in some way. Almost any sort of ordering will help, even if it is no more than arranging the names in alphabetical sequence. Organizing the material, therefore, is the first important principle to be observed in communicating facts.[21]

The bowed serial position curve: A second important principle is that of the bowed serial position curve. When material is presented in the form of a list, it has been found repeatedly that items at the beginning and at the end of the list are learned more quickly and retained longer than items in the middle of the list. Retention is poorest for items just past the middle of the list, but from this point toward the end of the list, or toward the beginning, the amount of retention for each successive item improves.[22] The curve is pictured in Figure 2.

The von Restorff phenomenon: According to the von Restorff phenomenon, an item is easier to learn and to retain if it is isolated from the other items through being distinctive in some way or other. Suppose if there is a list of seven names, and the fourth name is printed in red, or in a different style of type, it would probably be retained about as well as the first and last items. In fact, it would even improve

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[21] Ibid., p. 104.

[22] Ibid.

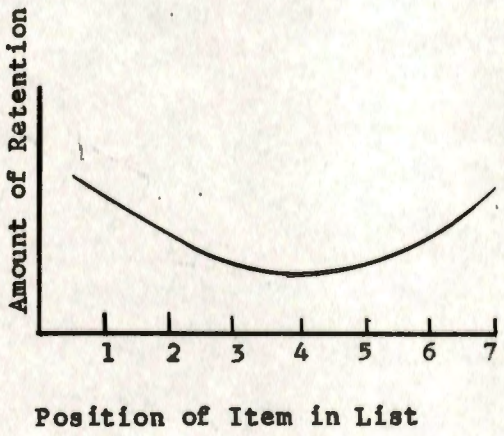


Figure 2. The Bowed Serial Position Retention Curve.

the retention of the items on either side of it, and two smaller bowed serial position curves would be obtained, as in Figure 3. The principle of the von Restorff phenomenon is well illustrated in advertising displays.[23]

Paired-associate learning: Perhaps the simplest way in which facts can be related is in pairs. In this case an associate connection between the two members of each pair is set up. Learning of this kind is called paired-associate learning, and it comprises a surprisingly larger portion of everyday communication. In paired-associate learning, an associate connection between the two members of the first pair and another connection between the two members of the second pair, is established. In studies of conditioned responses it has been shown that a delay of even two or three seconds between the stimulus and the response increases the difficulty of getting the response attached to the stimulus. Hence, perhaps, the least efficient way of getting the desired connections formed is to increase the delay by seperating the members of each pair. This would greatly increase the difficulty of the learning task.[24]

Non-interference in paired learning: In this case what is true of the single items of information in the case of unrelated facts is also true of pairs of items. In the first place, it is advantageous to organize the pairs in some sequence. In the second place, no matter which sequence is used, the pairs at the beginning and at the end of the list will be retained better than those in the middle and, in the third place, if one of

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[23] Ibid.

[24] Ibid.

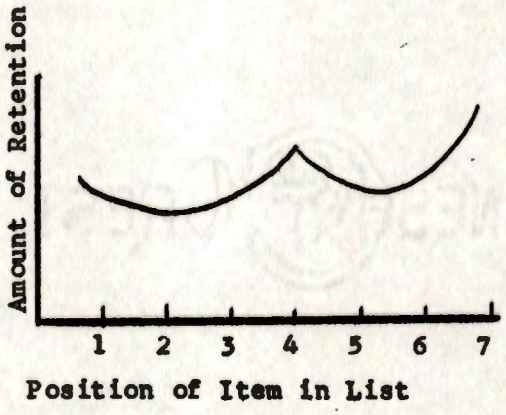


Figure 3. The von Restorff Phenomenon in a Retention Curve.

the pairs is isolated from the other by being distinctive in some way or another, this pair will be easier to learn.[25]

Contiguity in associated learning: The principle of contiguity means that if two items are to be associated, they should be presented to the audience close together in space and time. Nothing should occur between the two members of the pair that would interfere with the formation of the connection between them. In everyday situations this principle is generally neglected.[26] For example, the usual procedure in teaching vocabulary to very young children is to show them a picture and ask them what it is. In using this procedure, a great deal of time is allowed between the presentation of the picture and the occurrence of the word for the picture. Here, even a delay of a few seconds can make big difference. Moreover, during the delay period, the child may make a wrong response, and the occurrence of this wrong response will interfere with the establishment of the connection between the word and the picture. The most efficient procedure is to present the picture and the word together again and again. It is important here not to confuse the training and the testing.[27]

Mnemonic Devices: Use of previously formed connections as mnemonic devices can be made in order to mediate the connection between the two members of the pair. For example, teachers in Chemistry frequently resort to use of a mnemonic device consisting of the first letters of the primary elements

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[25] Ibid., p. 105.

[26] Ibid.

[27] Ibid.

found in greater abundance in the earth. They use the term like CHOPKINS CaFeMg which denotes the first letters of each element to be learnt viz.. Carbon, Hydrogen, Oxygen, Phosphorous, Potassium, Nitrogen, Sulphur, Calcium, Iron and Magnesium. Needless, to say, correspondences of this kind rarely occur by chance, but in many cases, one can frequently find some little device that will at least help to form the connection.[28]

Explaining Something

A typical example of the communication of related facts occurs when something is explained to somebody. In a theoretical, scientific explanation the fact to be explained is deduced from some more general statement. Thus, the relationship here is a logical one.

A more usual sort of explanation, however, is one in which the relationship between the facts is empirical. An instance of this is an explanation of a process or an explanation of how a piece of equipment works. Explanations of this kind are largely combinations of the two previously discussed kinds of learning, namely serial learning and paired-associate learning. Hence all the previously discussed principles apply here. In certain situations symbolic diagrams were found to be effective than the actual equipment or even pictures of it. In fact, in some cases a symbolic diagram may even be superior, since it cuts down the number of extraneous stimuli-stimuli that are irrelevant to the particular task of learning. In one experiment performed by the United States Air Force

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[28] Ibid.,

it was found that an elaborate display using actual jet engine parts mounted on a board and costing in the neighborhood of $80,000 was no more effective than a symbolic diagram that could be produced for less than five dollars.[29]

Teaching A Perceptual-Motor Skill

It is well known that in training someone to perform a perceptual-motor skill the key concept is practice, but it is perhaps worthwhile to point out that not all perceptual-motor skills are alike. A distinction, though perhaps not a very clear one, can be made between two types of perceptual-motor learning problem. One is the case of the person who has mastered all the components of the skill, but does not know which of the things that he has mastered are components, and furthermore does not know in which order to assemble these components. For example, the problem of learning to pick out a one-fingered melody on a toy piano with numbered keys can be taken. This is a perceptual-motor skill, but it can be learned by most adults in our culture without any overt practice whatever, since there is no need to learn how to strike the keys. What is needed to learn is which keys should be struck and in which order. To be sure, in learning this, practice is needed, but overt practice with an actual toy piano is not needed, since the problem resolves itself into the serial learning task of memorizing a sequence of numbers. The practice needed is in implicitly saying the numbers in their proper sequence.

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[29] Ibid., pp. 105-106.

Perceptual-motor tasks of this type lend themselves very readily to teaching by visual and auditory means to large groups of people.

Another type of perceptual-motor learning is one that might be described by saying that the person knows what should be done, but does not know how to do it. Learning a correct follow-through in driving a golf ball, or learning to play an arpeggio on a violin are cases in point. In these skills it would be an understatement to say that the cues are not readily symbolizable. Skills of this type may be considered to consist of a series of component responses. The cue for each component response is produced by the response that precedes it. The difficulty of learning a skill of this type is enhanced by the fact that if any component response is incorrectly performed it will furnish false cues for the succeeding response. What is required to learn a skill of this type is actual overt practice with knowledge of results, plus whatever aid can be given by a coach or someone else who acts as a critic of the performance. The help a coach can give, though necessary, will usually be quite little, because the coach cannot provide the student with proper cues for the performance. Only the student can do that. Since the student must practice overtly, and since the cues for correct practice must be provided by the student himself, and cannot be either verbalized or presented to him in pictures, teaching a skill of this type is by far the most difficult task that the visual and auditory methods are called upon to perform.[30]

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[30] Ibid., p. 106.

CHAPTER IV

RESEARCH DONE ON VISUAL AIDS AND RESULTS

The visual and auditory movement in American education began in 1904 with the opening of the St. Louis Educational Museum. It has grown to a point where an estimated twenty million dollars per year is spent on visual and auditory materials, equipment and services, exclusive of salaries. Since 1918, the visual and auditory movements have been rooted to some degree in a history of research, and the history of this research has been largely one of support by grants from agencies, philanthropic funds and the military services. Although individuals seeking higher degrees in Universities have contributed a share of significant studies to the literature, the burden has been primarily carried particularly in recent times, by the major film and television research programs.[1]

From an educational point of view, it is important to know what kind of research has been conducted on the effectiveness of various visual aids in promoting learning, what valid conclusions can be derived from the mass of accumulated research data, and which of the prevalent beliefs about the effectiveness of these visual aids are supported by controlled observations and empirical data.

This information is needed by both the sponsors and producers of educational and training visual aids so that planning and production may be more efficient in terms of both process and end-product. It is needed

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[1] William H. Allen, "Audio-Visual Communication," Encyclopedia of Educational Research, 3rd edition (New York: The Macmillian Company, 1960), p. 115.

by users of visual and auditory channels so that best results can be realized in mass instruction, training and public information. Research workers in the field need this information to avoid the unnecessary repetition of previous studies and to help in the better formulation of problems and the better design of new experiments so that systematic knowledge of the principles of visual communication can be extended and refined. Theory is, in the final analysis, a very practical thing for practical people.[2]

The purpose of this chapter is to present such a summary of the visual aids research published so far. In concluding this review of research on each visual aids, a series of principles which appear to govern the influence of the same will be presented. It is hoped that they may prove to be useful in the future planning, production and use of visual aids for rural educational programs. Educational television will not be dealt with since research completed in that area is already vast enough to warrant separate summary and study beyond the objectives of this thesis.

I. MOTION PICTURES

The history of research in educational motion pictures is really the history of research in the field of visual and auditory communications: for, until the most recent research in educational television, the major research efforts in visual and auditory fields have been focussed on motion pictures. In considering the results of studies, it is apparent

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[2] Charles F. Hoban, Jr. and Edward B. Van Ormer, Instructional Film Research 1918-1950 (Rapid Mass Learning), Technical Report No. SDC 269-7-19 (PORT Washington: Special Devices Center, 1951), p. 1-1.

that the early films were far below present-day quality; many of ths studies having been made twenty, or even more than thirty, years ago. The findings of studies conducted prior to 1929 are based on the use of silent films and, hence, cannot be considered to apply directly to sound film. However, many of the instructional advantages of pictures, and especially moving pictures, should be common to both silent and sound films. A certain amount of generalization is therefore possible.[3] With this in mind, available research studies on the influence of motion pictures published or reported in English were examined critically and the conclusions of important experiments which were supported by experimental evidence were abstracted and stated. These summaries were then classified under the following headings: (1) instructional objectives imparting a knowledge of facts; (2) instructional objectives teaching perceptual-motor skills; (3) instructional objectives, influencing motivation, attitudes,opinions and cues; (4) instructinal value of films comparing them with other media and methods of instruction; and (5) audience characteristics. Each of the headings listed above was then broken into appropriate study areas, and each study that was reviewed for consideration in the current investigation was classified under the area to which it appeared to contribute the greatest number of relevant data.

1. Instructional objectives imparting a knowledge of facts.

For our purposes, the inquiry will be divided into three phases namely; (a) the imparting of factual knowledge by films; (b) the influence

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[3] Ibid., p. 6-1.

of films on conceptional learning, and (c) the long-time retention of knowledge from films.

a. Imparting factual knowledge of films. A number of studies selected largely from the research programs carried on in the United States are given below to furnish data on the above mentioned phase of the problem.

Holaday and Stoddard Study. One of the best known studies of films which relates to knowledge of facts is that of P. W. Holaday and G. D. Stoddard (1933). The study, pursued from 1928 to 1930, inclusive, was conducted as a part of the Payne Fund studies of the effects of entertainment films on approximately 3000 children and 200 graduate students and young faculty members. The following conclusions, among others, were reacted:

1. The general information of children and adults is increased to a considerable extent by information correctly shown in motion pictures.

2. General information presented incorrectly by the pictures is frequently accepted as valid unless the incongruity is quite apparent. The content of a picture is accepted as authentic by a large percentage of the audience unless the errors contained are glaring ones.

3. Retention of the specific incidents of motion pictures is high. Children, even very young ones, can retain specific memories of a picture with a high degree of accuracy and completeness. The second-third grade group retained on the average nearly sixty percent as much as the group of superior adults.[4]

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[4] Ibid., p. 3-2.

Hovland, Lumsdaine and Sheffield Study. One of the primary objectives of the Why We Fight films, which were an important phase of the Army's orientation program in World War II, was to add to the factual knowledge about the events leading up to the war and the progress of the war. While the effectiveness of these films in changing a soldier's opinions and motivations was not strikingly evident, their effectiveness in influencing his knowledge of facts appears to be clearly established. Three different studies by C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield (1949) showed that these films had a sizable effect on increasing the factual knowledge of Army trainees concerning the background of the war, the Nazi strategy, and the events of the Battle of Britain. Measurements were made approximately a week after the trainee had been shown one or more of these films. It is pointed out that the increase in factual learning from these orientation films depended greatly on the educational level and the intelligence of the men - a conclusion that is brought out when the results are compared on the basis of grade school, high school, or college groups.[5]

Knowlton and Tilton Study. D. C. Knowlton and J. W. Tilton (1929) made a study of contributions of the Yale Chronicles of America Photoplays to teaching historical facts. Knowlton and Tilton reported that the scores of the groups that received film instruction in addition to the regular instruction exceeded those of the groups that received the regular instruction only. The test results for the film groups, were given in terms of percentage of superiority of their mean scores over those of the non-film

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[5] Ibid., 3-3.

groups. The mean differences on which these percentage gains are based approached high reliability in the case of historical relationships only, and not in the case of two other categories. On the other hand, there is some evidence to suggest that these Photoplays interfered with the teaching of time relationships, or at least did not facilitate the development of this type of understanding. Film groups were ten percent inferior to non-film groups in their learning of historical time relationships, but the difference had low reliability.[6]

Wise Study. In a second Yale Photoplay study, H. A. Wise (1939) studied the effectiveness of the Yale Chronciles of America Photoplays in teaching history, using eleventh grade pupils for his experimental subjects. Wise's findings confirmed those of Knowlton and Tilton in that the groups receiving regular instruction plus film instruction showed reliably greater gains in historical knowledge than groups receiving only regular instruction. In measures of time relationships, Wise found some superiority in favour of the film groups (11.8 and 7.8 percent) which was rather low reliability. This latter finding seems somewhat at variance with that of Knowlton and Tilton. However, the two studies agree that it was more difficult to teach time relationships by means of these films than it was to teach certain other knowledge outcomes.

Wise also found that on the Columbia Research Bureau's American History Test, administered at the beginning and end of the experiment,

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[6]Daniel C. Knowlton and J. Warren Tilton, Motion Pictures in History Teaching (New Haven: Yale University Press, 1929), pp. 85-93.

the film group was slightly superior to the non-film group. The percentage of superiority of mean gain for the film group was 18.3. In the Knowlton and Tilton experiment Van Wagenen Information Scale C-2 was administered at the beginning and end of the experiment to samples of the film and non-film classes. A very slight superior gain (three percent) was noted for the film groups on this test.[7]

Wise Study. H. E. Wise (1949) in reporting on part of the Nebraska study of the enrichment effects of the motion pictures in rural schools found that, on informational tests directly related to the content of the biological science films used in the study, film groups were reliably superior to non-film groups. But, on a standardized achievment test, the slight superiority of the film groups did not meet criteria of statistical reliability.[8]

Scott Study. Another more extensive study from the Nebraska Program, by G. Scott (1949), adds much support to this concept of the specificity of factual learning from films. Scott found that the influence of the films tended to be specific to the areas covered by those films and was less evident in a standardized test of achievement in the year's work. The superiority of the film groups on the specific area tests was reliable and appreciable in all seven subjects. On the other hand, in only two of the six subjects where standardized tests were given was there a reliable difference in favour of the film groups.[9]

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[7] Harry A. Wise, Motion Pictures as an aid in teaching American History (New Haven: Yale University Press, 1939), 187 pp.

[8] H. E. Wise, "Supplementary contributions of Sound Motion Pictures in High School Biology," Science Education, XXXIII (1949), pp. 206-213.

[9] Hoban and Van Ormer, op. cit., p. 3-5.

b. Influence of films on conceptual learning. The studies conducted in this area are given below.

Rulon Study. To investigate the influence of films on "rote" and "eductive" learning, P. J. Rulon (1933), at Harvard University, studied the effect of adding eight sound films to usual methods of instruction. The tests were scored separately for rote (subject matter facts) and eductive (principles involved) items, and it was found that pupils taught by text plus films excelled the text-only pupils by a larger margin on the eductive items than on the rote items. In regard to the greater superiority of the text-plus-films pupils on eductive items than on rote items, Rulon reports that performances on eductive items "can be predicted more accurately from a knowledge of mental ability and previous achievement (in general science) than can performance in terms of rote items." It is a conceivable hypothesis that the film presentations in some way appealed to the science interest and reasoning of students, thus increasing the text-plus-films group's performance more on the eductive items than on the rote items. Differences between the rote and eductive items were in the same direction as differences between verbal-test items and picture-test items, which Rulon reported as meaning that his "picture tests measure eduction to a greater extent than do the verbal tests."[10]

Vernon Study. Additional evidence on the effectiveness of motion pictures by themselves in aiding conceptual learning (understanding of facts presented) comes from a study of motion pictures and filmstrips

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[10] Phillip J. Rulon, "The Sound Motion Picture in Science Teaching," Education, LIII (February, 1933), pp. 335-337.

conducted during World War II. P. E. Vernon (1946), a British psychologist associated with the Senior Psychologist's Department of the British Admiralty during World War II, reported a study of a motion picture and a silent filmstrip in training British seamen to take soundings with a lead line and a Kelvin sounding machine. Despite certain inadequacies pointed out by Vernon, this study was productive of several useful insights into the role of films and filmstrips in informational and conceptual learning. The following variables were found to be reliably most effective in instruction (one percent level of confidence): 1. the filmstrip; 2. the film; 3. good instructors, and 4. high intelligence. Vernon pointed out, among other things, that the addition of the film to the usual instruction and also to the groups having instruction aided by the filmstrip, was beneficial to both groups. In the case of the latter group, the benefit was chiefly an increase in the comprehension scores. He suggests that apparently the memory for details tested by the memory questions was already fixed by the filmstrip; but that the film aided better understanding of the comprehensive questions. No striking differences were noted between the film and the filmstrip in effectiveness, but the film plus filmstrip with no other instruction compared with the film alone (no other instruction) produced 14.6 percent improvement in memory for details and 56.7 percent improvement in comprehension scores. These were the highest percentages reported; but Vernon is inclined to discount this surprising result since the film-plus filmstrip group was only one class.[11] Obviously the additional instruction time factor would also discount the results of the study.

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[11] P. E. Vernon, "An Experiment on the Value of the Film and Filmstrip in the Instruction of Adults," British Journal of Educational Psychology, XVI (November 1946), pp. 149-162.

Gibson, et. al., Study. A significant experiment conducted by Gibson and others has been reported from the Psychological Test Film Unit of the AAF Training Command (J. J. Gibson 1947). In this study it was found that aviation cadets learned and remembered more about the system of position firing from a training film than they did from either classroom teaching or a study of a manual. Both of these latter methods made use of good visual aids, slides with the lecture and illustrations in the manual, and were judged to be as effective as they could be made. An analysis of the test items and the film showed that the items in which the film did the most superior teaching were "dynamic" items dealing with a sequence of events or with the variations of one thing with another.[12]

c. Long-time retention of knowledge from films. The experiments conducted in this area are detailed below.

Holaday and Stoddard Study. One aspect of the P. W. Holaday and G. D. Stoddard study (1933) (which is part of the Payne Fund Study), is concerned with the amount of long-time retention of factual information from films. This study is of particular value since it reported long-time effects of films on factual knowledge which were different from those reported in previous studies of learning. While some deterioration of responses, both of a specific and general nature, was evident over a period of from one to seven months after the movie experience, there was evidence of an unusual persistence in the retention of response, and in

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[12] Hoban and Van Ormer, op. cit., pp. 3-7-3-8.

some cases evidence of increments of response to the films some weeks and months after they were seen. Holaday and Stoddard reported that the retention of specific scenes remained high over a long period of time. Their findings for the amount of retention by the "delayed-test" group was expressed as a percentage of the average scores of the "immediate-test" groups. On some individual test items and occasionally on entire tests, an age group had a higher average retention on tests a month and a half or three months after the picture than it did the day after the picture. This situation occurred most frequently in the second and third grades, but it was common with all three of the older groups.[13]

Hovland, Lumsdaine and Sheffield Study. In their studies of the effectiveness of the Why We Fight films, C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield (1949) present data on the amount of long-time retention of factual information from army indoctrination films. As a part of their study, Hovland, Lumsdaine and Sheffield made a comparison between the short-time and long-time effects of the film entitled The Battle of Britain. Three film companies and three control companies (900 men) were given the questionnaire five days following the film showing. Two other film companies and two other control companies (500 men) were not given the questionnaire until nine weeks after seeing the film. This was the longest time period during which the investigators could retain the experimental population under war-time training conditions. It is to be noted that equivalent groups of men, not the same men, were used for the long-time testing, in order to avoid the practice

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[13] Ibid., p. 3-8.

effect on test results from a second administration of the test to the same population. In this study of "long-time" retention of the factual learning from the film, it was found that the mean score advantage on the fact-quiz after nine weeks was slightly less than half as great as the short-time advantage (22.6 percent vs 11.1 percent). Thus, the increment in factual knowledge attributable to film experience was reduced by 50 percent in nine weeks. Six of the ten fact-quiz items showed decrements with the passage of time; the remaining four either showed no decrement, or an unreliable change. These four items were the ones which had shown the smaller short-time effects. In no case does an item fail to show some advantage for the film group even at the nine-week interval.[14]

Knowlton and Tilton Study. The D. C. Knowlton and J. W. Tilton study (1929) also provided information about the amount of long-time retention of material learned from the Yale Photoplays. The findings indicated that the contributions of films might have been greater in immediate learning than in retention of material learned, but superior to non-film instruction in both. The major exception to this was the learning of historical relationships other than those of time. Here the difference between immediate scores and retention scores was reversed. The film groups were 43 percent superior in retention of material learned and 35 percent superior in immediate learning to the non-film groups.[15]

Rulon Study. In his study of the comparative effectiveness of films in producing "rote" and "eductive" learning, P. J. Rulon (1933)

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[14] Ibid., p. 3-9.

[15] Knowlton and Tilton, loc. cit.

furnished data about the relative persistence of the information gained from instruction by the combined use of text plus films and that gained from instruction by the text only. Rulon found that, although some forgetting took place, the superiority of the "text-plus-films" group was greater three and one-half months after the film than it was immediately afterward. Thus, the persisting differential benefit of instructional films reported by Rulon becomes greater after a lapse of time, rather than smaller. The advantage found in favor of the "text-plus-films" pupils becomes more evident in Rulon's critical analysis of the test results. He contrasted the scores of the experimental groups on items covered only in the text with the scores obtained on items covered in both text and films. He found that on text-only items the initial superiority of text-taught pupils disappeared in three and one-half months, and the two groups had approximately the same retention scores; on the test items included in both film and text, the "text-plus-film" pupils were 56.4 percent superior to the "text-only" pupils on the delayed tests. It appears reasonable to conclude that where there was overlapping of subject content between film and textbook, pupils taught by both instructional media were definitely superior in retained learning to those taught by text only.[16] Rulon's work might have been even more useful had he included a "film-only" group to compare with his "text-plus-film" group.

2. Instructional objectives teaching perceptual-motor skills.

Another major objective of instructional films is training individuals to develop perceptual-motor skills, that is, to coordinate

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[16] Rulon, loc. cit.

body movements with sensory impressions. The inquiry will be divided into two phases: (a) perceptual-motor learning from films; and (b) implicit practice and verbalization in learning a motor skill. Each phase will be further subdivided for convenience.

a. Perceptual-motor learning from films. The skills under consideration lend themselves to classification under three broad headings: (1) "academic" skills, or the skills usually taught as part of an academic curriculum; (2) athletic skills, and (3) industrial or mechanical skills.

(1) Academic training. McClusky and McClusky Study. In an early study, F. D. and H. Y. McClusky (1924) conducted two experiments with 350 pupils in the fourth, fifth and sixth grades. Their objective was to measure the relative effectiveness of a film, teacher-demonstration, stereographs and slides in training the pupils to make a reed mat in one experiment and a pasteboard box in the other. In both cases, the teacher-demonstration was superior to all other methods when effectiveness was measured by scoring the finished mats and pasteboard boxes on a quality scale. In the pasteboard box experiment, the order of effectiveness was (1) demonstration (2) stereographs, (3) film and (4) slides. In the mat experiment, the order of effectiveness was (1) demonstration, (2) film, (3) slides and (4) stereographs. Eleven methods were found to be somewhat effective, but consistent differences were found among the several small groups used in the study. No measures of statistical reliability of differences were reported, so that the practical significance of the differences among methods cannot be estimated.[17]

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[17]F. Dean McClusky and H. Y. McClusky, "Comparison of Six Modes of Presentation of the Subject-Matter Contained in a Film on the Iron and Steel Industry and One on Lumbering in the North Woods," Visual Education, F. N. Freeman, editor (Chicago: University of Chicago Press), pp. 229-257.

Hollis Study. In another early study A. P. Hollis (1924) investigated the relative effectiveness of films, versus teacher-demonstrations and oral instruction in teaching 29 eighth-grade pupils to cook an omelet. No conclusive evidence on the effectiveness of these two methods was obtained.[18]

Freeman, Shaw and Walker Study. F. N. Freeman, L. A. Shaw and D. Walker (1924) in a third early study, investigated the effect of a film plus regular instruction in teaching handwriting position and performance to 1528 students in the fourth through eighth grades. Freeman and others found the films to be consistently superior in bringing about improvement in the handwriting position, but not improving the quality of the handwriting. No reliability data were reported. The authors stated that an opportunity for the individual to evaluate his results was the most influential factor in helping to improve his performance, regardless of the medium of instruction used. This psychological factor is of prime importance in producing improved methods of instruction, and failure to employ it imposes limitations on any medium of instruction.[19]

(2) Athletic Training. Ruffa Study. E. J. Ruffa (1936) investigated the influence of specially produced regular-speed and slow-motion silent films, supplemented by several films showing prominent track stars in

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[18]A. P. Hollis, "The Effectiveness of Motion Picture Demonstration by the Teacher, and Oral Instruction in Teaching Cooking," Visual Education, F. N. Freeman, editor (Chicago: University of Chicago Press, 1924), pp. 339-341.

[19]Frank N. Freeman, Lena A. Shaw, and D. E. Walker, "The Use of a Motion Picture Film to Teach Position and Penholding in Handwriting," Visual Education, F. N. Freeman, editor (Chicago: University of Chicago Press, 1924), pp. 282-309.

action, in teaching athletic skill (football throw, 100-yard dash, high jump, broad jump and shot-put) to tenth-grade boys. He found some evidence which suggests that when these films were shown without demonstration, required practice or oral instruction, the results were equivalent and perhaps slightly superior to those from the combination of oral instruction, demonstration and practice, the same amount of time being involved in both cases. It is reported that the film group did more voluntary practicing than the other group. It may be that part of the influence of the film was to motivate more of this type of practicing.[20]

Priebe and Burton Study. R. E. Priebe and W. H. Burton (1939) studied the effects of the films in teaching tenth-grade boys the high jump. The authors reported that the group taught with the additional aid of the "champion" and "diagnostic" films was superior to the control group after the six weeks of instruction. Another observation that the films seemed to eliminate to a large extent the initial trial-and-error behaviour found in the western roll jumps of the control group was also reported by the authors. The general observation was also made that more boys could be handled per unit of time by use of the films, and that the film group showed more interest in learning the jumping.[21]

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[20] Edward J. Ruffa, "An Experimental Study of Motion Pictures as Used in the Teaching of Certain Athletic Skills," (unpublished Master's thesis, The Leland Stanford Junior University, Stanford, 1936), pp. 18-29.

[21] R. E. Priebe and W. H. Burton, "The Slow Motion Picture as a Coaching Device," School Review, LVII (1939), pp. 192-198.

Brown and Messersmith Study. A similar study, involving the teaching of tumbling to college freshmen, was reported by H. S. Brown and L. Messersmith (1948). It was concluded that the experimental group, taught with demonstration and diagnostic motion pictures, was superior to the control group taught without the films, but this difference was not highly reliable statistically. Incidentally, the non-film group was slightly, but not reliably, superior to the film group on the equating measure of muscle educability.[22]

Adams Study. T. Adams (1939) investigated the effectiveness of teaching the serve in tennis by methods similar to those used in the Priebe and Burton study, that is, with "champion" and "diagnostic" films. Adams reported that the slow-motion picture was of superior value in comparison with verbal instruction or demonstration. He estimated that good films can cut the learning them fifty percent.[23]

Lockhart Study. J. B. Lockhart (1942) studied the effects of a specially prepared silent film on bowling used with the "regular method" of instruction in teaching college-freshman women to bowl. She found that with the addition of the film the learning progressed more regularly in its early stages and reached a higher level sooner. But the study, in which the procedure and controls are poorly described, reports that, after six 30-minute practice periods spaced over two weeks, the mean scores on the ten first balls for the experimental and control groups were the same.[24]

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[22]H. S. Brown and L. Messersmith, "An Experiment in Teaching With and Without Motion Pictures," The American Association of Health, XIX (1948), pp. 304-307.

[23]Thurston Adams, Motion Pictures in Physical Education: Teaching the Tennis Serve with School-Made Films (New York: Bureau of Publication, Teachers College Columbia University, 1939), pp. 1-57.

[24]Hoban and Van Ormer, op. cit., 4-4.

(3) Industrial training. Vandermeer Study. A. W. VanderMeer (1943, 1945) reported the only extensive study, other than those undertaken by the Instructional Film Research Program, of the influence of motion pictures on the learning of perceptual-motor skills of the type required in modern industry and in the armed services. Prior studies on athletic skills, and mat and pasteboard box-making, though informative, do not apply to the skills required to manipulate modern machines. The Vandermeer study showed that: (1) the film group cut working time per completed unit; (2) the film group had fewer rejects, and (3) the film group gained more factual information.[25]

Beck and Lumsdaine Study. A less extensive study related to industrial training with films was conducted by L. F. Beck and A. A. Lumsdaine for the Army Pictorial Service, and has been reported by Hoban (1946). The purpose was an exploratory comparison of two methods of teaching the assembly and disassembly of a portable radar station: (1) with a film, and (2) with a competent instructor using a scale model. In terms of the time required to complete the assembly and disassembly, the parts of the procedure taught by the film were completed, on the average, in slightly less time than was required when the process was taught by the instructor demonstration. It was also concluded that the men preferred the film to the average instructor. Two further observations of a non-quantitative nature were reported: (1) the men who received film instruction appeared to the experimenters to perform more as a

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[25] A. W. VanderMeer, "The Economy of Time in Industrial Training: an experimental study of the use of sound films in the training of engine lathe operators," The Journal of Educational Psychology, XXXVI (Feb., 1945), pp. 65-90.

team than did those to whom the films were not shown, and (2) they appeared to require less additional on-the-job instruction than did the others.[26]

Film Research Program Studies. Problems of perceptual-motor learning from motion pictures have been investigated in studies of the Instructional Film Research Program (Jaspen 1948, 1950; Roshal 1949; Zuckerman 1949). These studies are concerned with determining the best combination of film variables for producing learning of perceptual-motor tasks, as well as with measuring the effectiveness of individual variables. One outstanding finding which relates to this study was obtained in one of Jaspen's studies (1948). He found that 98 percent of a large group of Navy trainees were able to assemble the breechblock of a forty millimeter antiaircraft gun after a single showing of an experimentally produced film. In the Roshal study, experimental versions of a film were designed and produced to teach Navy trainees to tie three knots of graduated difficulty. It was observed that the performance of persons who saw the film once was superior to those trainees who did not see one of the film versions. Zuckerman, using the films produced for Roshal's study, but with modified commentary, studied among other things, the effect of level of verbalization (number of words per minute of film) in learning to tie the three knots. The definition of the levels of verbalization varied somewhat with the difficulty of the knots. He found the medium level of verbalization superior to either the low or high levels.[27]

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[26] Hoban and Van Ormer, op. cit., p. 4-5.

[27] Ibid., p. 4-6.

b. Implicit practice and verbalization in learning a motor skill. This type of study involves the problem of "participation" or "practice" in film learning, and of the possible equivalence to, or superiority of, this type of "participation" or "practice" over more overt practice in other instructional situations. The studies under this topic will be dealt with in two sections, namely: (1) implicit practice, and (2) verbalization in mental practice.

(1) Implicit practice. Twining Study. W. E. Twining (1949) made a study of mental practice involved in the motor skill of ring toss. (This activity consists of throwing six-inch Manila hemp rings at a stake, one foot high and an inch in diameter; placed ten feet from the subject.) He arrived at the following conclusions: (1) prolonged mental practice is difficult; (2) mental and physical practice were both effective; and (2) implicit muscular activity or action currents are possible. (Other investigators have shown that frequently, and possibly always, when an individual thinks about specific movements, action currents, if not implicit muscular tensions, are created in the muscle groups which would perform these movements. Possibly this neural innervation is in some way beneficial in establishing a pattern of neural activity, which later shows up in overt improvement.) The reasons for the benefit from mental practice, he points out, are obscure. Implicit muscular activity has been demonstrated by G. L. Freeman (1931) and others. Twining suggests that possibly coordination was improved by such implicit muscular activity during "mental practice."[28]

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[28]W. E. Twining, "Mental Practice and Physical Practice in Learning a Motor Skill," Journal of the American Association for Health, Physical Education and Recreation, XX (1949), pp. 432-435.

Phillips Study. B. E. Phillips (1941) reported findings that seem to bear upon the involvement of kinesthetic imagery in perceptual-motor learning. He found that, of his various kinesthetic perception tests, certain tests were most useful for predicting, in the early stages, the rate of learning of two perceptual-motor skills (putting and driving golf balls). In the "best" tests each subject was required to reproduce blindfolded, the movement which he had just gone through. The movements made during the "best" tests were much like the movement actually made in learning the two skills. This repetition of movement would seem to require the temporary retention of kinesthetic images to serve as a basis of comparison with the new kinesthetic sensations.[29]

2. Verbalization in mental practice. Ruger Study. The process of verbalization is another aspect of mental practice. Forty years ago, in his study of adults solving mechanical puzzles, H. A. Ruger (1910) discovered the importance of verbalization in the solving of certain perceptual-motor problems. In introspective reports from his subjects after each trial, Ruger found that the decrease in time needed to solve a puzzle was definitely connected with a greater verbalization of the process, that is, with the subject's ability to put into words, partially at least, his insight into "how" the puzzle came apart. His most skillful learners, instead of spending all of their time in manipulating the puzzle, did a large part of this "manipulating" verbally

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[29] B. E. Phillips, "The Relationship between Certain Phases of Kinesthesis and Performance during the Early Stages of Acquiring Two Perceptual-Motor Skills," Journal of the American Association for Health, Physical Education and Recreation, XII (1941), pp. 571-586.

in an effort to set up certain assumed relationships that would aid them in actually solving the puzzle. There was no demonstration in the Ruger experiment.[30]

Thompson Study. May (1946) in an article on "The Psychology of learning from Demonstration Films" cited an unpublished experimental study by L. Thompson (1944) on the role of verbalization among fifth-grade pupils learning to assemble two mechanical puzzles. As May pointed out in his article, the pupils learned most rapidly when they were "encouraged and aided in making verbal discriminations between the parts of a model to be assembled and in formulating adequate and accurate verbal descriptions of the operations to be performed." Individual differences in speed of learning among pupils taught by the same method correlated with their verbal abilities. The verbal deficiencies of slow learners were very evident in the sound recordings made of their efforts to formulate adequate descriptions of the assembly process in the fifth and sixth methods of demonstrations in assembling the puzzles.[31]

3. Instructional objectives influencing motivation, attitudes, opinions and cues.

The influence of films on motivation, attitudes, opinions and cues constitute four major subjects of inquiry of this topic. In the

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[30] Hoban and Van Ormer, op. cit., p. 4-8.

[31] Mark A. May, "The Psychology of Learning from Demonstration films," The Journal of Educational Psychology, XXXVII (Jan, 1946), pp. 1-12.

first part, (a) three areas of motivation will be considered: (1) social conduct; (2) academic motivation, and (3) military motivation. The second part, (b) presents a number of studies on the effects of films on (1) specific attitudes and (2) on general attitudes. The third part, (c) contains the research findings (principally those of the U. S. Army Studies) on the likelihood of modifying specific and "general" opinions by means of films. The fourth part, (d) contains the research findings on the influence of films on cues (stimulus). This will be dealt with under three areas namely: (1) introductory sequences in visual demonstrations, (2) relevant cues, and (3) additional stimuli.

(a) Influence of films on Motivation of conduct. (1) Effects of films on social conduct. Suttleworth and May Study. In the Payne Fund studies, F. K. Shuttleworth and M. A. May (1933) investigated the reputation, conduct and attitudes of "movie-going" children in grades five through eight as contrasted with those of "non-movie-going" children. Shuttleworth and May presented data which indicate that children who are somewhat habitual abstainers from entertainment movies tend to be "good" boys and girls in school, judged by the school's standards of behaviour and reputation. Further, habitual movie-goers, were found to be considerably inferior in reputation, achievment and behaviour in school. These two extreme groups did not differ, however, in tests of honest behaviour outside of school nor in tests of persistence, suggestibility and moral knowledge. However, persistent abstainers from movie attendance among fifth to eighth-grade children were superior to persistent movie-goers on several reputational and behavioural

characteristics. The abstainers had higher deportment records, better scholarship records and better reputations among their teachers and classmates. In addition, they were more cooperative and self controlled, slightly less deceptive in school situations, slightly more skillful in judging the most useful, helpful and sensible thing to do and slightly more stable emotionally.[32]

Thrasher Study. In his study of movie attendance by children in a congested area of New York City, F. Thrasher compared the advancement in grade level of children who attended movies habitually (four or more times a week) with that of children who attended once a week or less. He found that in the habitual movie group, there was twice as many children retarded and half as many accelerated in their school curriculum as there were in the less-frequent-attendance group. Similarly, among delinquent boys, the percentage of habitual movie-goers was higher than among the non-deliquents. However, from the data of these studies it is not possible to establish causal relationships between movie attendance and the rate of advancement in school or juvenile deliquency.[33]

Blumer Study and Blumer and Hauser Study. H. Blumer (1933) reported extensive autobiographical accounts of high school young men and women on the effects that movies had on manners, social behavior, day-dreaming, emotions, life patterns and other behavioral characteristics. H. Blumer and P. M. Hauser (1933) reported similar data from delinquent populations. The data are difficult to interpret except in terms of

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[32] Hoban and Van Ormer, op. cit., p. 5-4.

[33] Ibid., p. 5-5.

general concepts. Blumer maintains that, for the individuals, "In a sense, motion pictures organize his needs and suggest lines of conduct useful for their satisfaction " (p. 195). The power of entertainment films he attributes in part to "emotional possession." The data reported by Blumer seem to substantiate that when certain patterns of behaviour, presented in films, are perceived by various individuals in the audience as means of gratifying unsatisfied "needs", these individuals will imitate or copy the patterns presented. The data seem to indicate, and this is a purely hypothetical interpretation, that specific motion pictures are perhaps more effective in stimulating or reinforcing existing motives than in reorganizing them or arousing new kinds of motives. Whatever reorganization may be involved appears to be in conduct patterns directly related to existing "needs" and motivational structure.[34]

Lashley and Watson Study. In a very early study mentioned previously, Lashley and Watson (1922) reported on the effects of the film Fit to Win on sexual behavior. While they found that the film immediately influenced members of the audience to "resolutions of continence," there was no actual effect of the film on sexual behaviour as measured by: (1) venereal disease frequency and prophylaxis frequency, and (2) information collected from interviews with doctors, clergymen and social workers who were in close contact with the test populations. There was some indication, however, that the film did influence behaviour of venereal disease infected audience members in the direction of seeking prompt treatment.[35]

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[34] Ibid.

[35] Ibid.

Freeman and Hoefer Study. F. N. Freeman and C. Hoefer (1931) investigated the effect of classroom films dealing with care of the teeth on: (1) daily brushing of the teeth; (2) diet, and (3) dental care. The results, unfortunately, were inconclusive due to several reasons.

Feshback and Janis Study. Another experiment (Freshback and Janis, 1951) concerned itself with the anxiety people have about dental health. Here, in connection with a film on proper care of the teeth, three groups of experimental subjects were shown a film which featured close-up shots of decaying teeth and diseased gums. Three versions of the horror film were produced: one designed to evoke a high degree of anxiety; one a medium degree of anxiety, and one a very mild degree. Ordinarily, one would expect that the higher the drive, the greater the amount of learning, but the greatest amount of learning that was achieved here was achieved by the medium anxiety group. Apparently the low anxiety group did not have enough drive. The medium anxiety group had more drive, and they learned something that reduced their anxiety. The high anxiety group had a great amount of drive, and they also learned, but they learned something that would reduce their anxiety even faster: they learned not to pay attention and not to think about their teeth at all. While this did not do their teeth any good, it did reduce their anxiety. This finding illustrates an important point. A strong drive is an uncomfortable thing, and anything that reduces that drive may be rewarding. People tend to do whatever will reduce the drive most quickly. The behaviour that will reduce the drive most promptly is not always the behaviour the communicator wants the audience to learn.

To generalize we can say that the threat of punishment for ignoring a warning is an unreliable motivator, since it may produce sufficient fear to cause forgetting, not only of the threat of punishment, but of the warning itself.[36]

Vandermeer Study. Vandermeer (1950) studied the effect of two versions of a film on personal hygiene upon subsequent personal hygiene behaviour such as washing one's hands after going to the toilet, purchasing a toothbrush and other habitual behaviour items. One was a straight lecture film and the other was what had been described as "a jazzed-up version with folk music in elaborate Hollywood style." Both versions apparently produced some change in personal hygiene behaviour and both versions were about equally effective. Increasing the interest in the film as such did not seem to put its message across any more effectively.[37]

(2) Effects of films on academic motivation. In studying the motivational effects of classroom films the majority of investigators have used "interest" as a measure of motivation. "Interest" apparently is used to denote a degree of involvement on the part of the individual pupil in the curriculum. This involvement is indicated, in part, by such activities as reading, reciting, constructing, making reports and bringing clippings to class. In general such activities imply voluntary behaviour and independent activity, that is, activity beyond the minimal require-

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[36] John O. Cook, "Research in Audio-Visual Communication," Research, Principles, and Practices in Visual Communication (East Lansing: National Project in Agricultural Communications, 1960), p. 93.

[37] Ibid., p. 92.

ments of the curriculum which are traditionally enforced by rewards and punishments in the school and the family. Motivational influences of films may be inferred from the voluntary nature of the activities.

Potthoff, Larson and Patterson Study. C. J. Potthoff, L. C. Larson and D. O. Patterson (1940) investigated the effects of the use of films in the course in human biology at the General College, University of Minnesota. The experimenters pointed out that the student population in the human biology course was not of high scholastic ability and apparently had an aversion toward the science course. It was found that the use of films resulted in an increased number of students enrolling for advanced courses in biology over the number enrolling from classes taught without films. Potthoff, et al., reported that "in this experiment, where we dealt with a class that included many pupils of indifferent or worse mind set toward science courses in general, the film heightened interest and apparently, favored the other desired outcomes." Aside from any values films may contribute, this finding alone justifies film use, (pp. 29-30), since, as the authors pointed out, people enrolled in science classes are likely to learn more science than similar people not so enrolled.[38]

Shuttleworth and May Study. F. K. Shuttleworth and M. A. May (1933) investigated the possible influence of movie attendance on the reading habits of children. They reported that boys and girls who frequently attend entertainment movies read more than those who seldom

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[38] Hoban and Van Ormer, op. cit., p. 5-6.

attend. When the magazines read by both groups were analyzed for "quality" a higher percentage of the boys and girls who seldom went to the movies reported reading magazines of higher quality, and higher percentages of the boys and girls who frequently go to the movies reported reading magazines of lower quality.[39]

Lazarsfeld and Kendall Study. P. F. Lazarsfeld and P. Kendall (1948) in their analysis of adult communications habits, reported on adult reading and movie-going. They concluded that adults who are moderate movie-goers tend to be moderate readers, whereas adults who avoid movies tend also to avoid books and magazines. This is in accord with the May and Shuttleworth comment that "there is no evidence of impoverishment as to amount of reading but rather the contrary" (p. 66) as far as movie-attendance, as such, is concerned.[40]

Wood and Freeman Study. B. D. Wood and F. N. Freeman (1929) investigated the value of silent films produced by the Eastman Kodak company. The teachers reported that films increased student "interest", as manifested by reading and bringing clippings and cartoons to class, but no quantitative data on actual behaviour were available.[41]

Knowlton and Tilton Study. D. C. Knowlton and J. W. Tilton (1929) studied the contributions of the Yale Chronicles of America Photo-

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[39] Ibid.

[40] Ibid., p. 5-7.

[41] Benjamin D. Wood and Frank N. Freeman, Motion Pictures in the classroom (New York: Houghton Mifflin Company, 1929), 392 pp.

plays (silent versions) to teaching history in the seventh grade. In this experiment film instruction was used not exclusively, but in addition to the usual instructional materials. They reported a ten percent increase in pupil participation (recitation) among classes taught with films over classes taught without films. An increase of forty percent in voluntary reading in the classroom, with an increase in the percentage of pupils reading and in the amount read, was reported for the film-taught groups.[42]

Hirsch Study. R. S. Hirsch (1949) reported a study of the value of films in changing attitudes toward literature. It was concluded that the film group had a greater shift in attitude (toward favoring desirable literature) and that bomerang effect (toward disfavor concerning desirable literature) occurred in the non-film group.[43]

May and Lumsdaine Study. May and Lumsdaine (1958) conducted an experiment using two versions of a film which presented a scientific explanation of the seasons of the year. One version of the film had a live dialogue, while the other version had only a narration. Fifth grade school students tended to prefer the live dialogue version more than the narration version, and those who were shown the live dialogue version even expressed somewhat greater interest in the subject matter of the film than those shown the narration version. Nevertheless, the amount learned

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[42]Daniel C. Knowlton and J. Warren Tilton, Motion Pictures in History Teaching (New Haven: The Yale University Press, 1929), pp. 85-93.

[43]Hoban and Van Ormer, op. cit., pp. 5-7.

from the narration version was greater than the amount learned from the live dialogue version.[44]

Kimble Study. Kimble (1953) conducted an experiment testing the effect of praise and reproof of student's performances on a test covering the preliminary phases of an instructional topic. They found that praise and reproof had no significant effects on subsequent test performance on material learned before the administration of praise and reproof. On material learned after the administration of praise and reproof there were, however, significant effects. The reproved group scored highest, the praised group next and the no-incentive-comment group lowest.[45]

May and Lumsdaine Study. It has been found (May and Lumsdaine, 1958) that showing a film version of a novel does not induce pupils to withdraw the novel from the library. However, showing interesting filmed episodes from a novel did increase the number of pupils who withdrew the book from the library. But when they were tested over the content of the book (Stevenson's Kidnapped) only the boys - not the girls - achieved test scores reliably indicating that they had actually read some of the book. However, some of the girls may have read the book, but not found it as interesting and memorable as the boys did.[46]

Harry M. Hague Study. H. M. Hague (1948) reported on the results a questionnaire which was completed and returned by the training directors

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[44] Cook, loc. cit.

[45] Ibid.

[46] Ibid., p. 93.

of 112 department stores and fifteen specialty stores with annual sales volume of over $5,000,000. Supplementary information was obtained through personal interviews with training directors in forty-four of these stores. One half of the forty-four training directors interviewed in connection with the survey to measure the degree of effectiveness of retail training films had definite ideas concerning the specific advantages of films as a retail training device. The results of the survey may be summed up:

1. Films increase interest and enthusiasm
2. Films add authority to the training message
3. Films make subject matter more easily understood
4. Films increase retention of material learned
5. Films may decrease training time
6. Films do not decrease training personnel required.[47]

Industrial Training Film and Slidefilm Project Program. Visual and auditory materials were used in training millions of industrial workers during World War II. Most of the industrial training films and slidefilms were produced by the U. S. Office of Education. In U. S. Office of Education Bulletin No. 13 (1946), F. E. Brooker critically described the results of the industrial film and slidefilm project program. A questionnaire was sent to 500 purchasers of the Office of Education training films, inquiring as to the value and effectiveness

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[47] What Research Shows About Visual Aids, (Washington D. C.: United States Department of Agriculture, Extension Service, 1949), pp. 21-22.

of the films. Both industrial and educational users were in agreement that the films increased interest, improved instructions, resulted in greater comprehension and improved quality of workmanship.

Brooker reported three observations concerning the films which were almost unanimously agreed upon by training directors:

(1) Films speeded up training without any loss in effectiveness. Estimates as to the amount of acceleration varied.

(2) Films made the classwork more interesting and resulted in less absenteeism.

(3) Films made on the University and College level were used successfully on lower grade levels.[48]

3. Effects of films on Military Motivation. Hovland, Lumsdaine and Sheffield Study. Hovland, et al., (1949) investigated the motivational influences of the Army's orientational film, The Battle of Britain, in terms of verbal statements relating to: (1) willingness to serve as a soldier; (2) insistence upon unconditional surrender, and (3) resentment against the enemy. Two questions were asked to determine the influence of The Battle of Britain on the troops' acceptance of their role as soldiers. The first question involved a choice between domestic and overseas duty after training. The second question investigated whether the men felt more helpful in winning the war "here in the Army" or "in the job you had before you came into the Army". Three major findings were reported. The first finding was that there was little evidence to indicate that a substantial increase in military motivation

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[48] Ibid., p. 25.

occurred, or that any such increase could be attributed to the film, The Battle of Britain. In an analysis of questionnaires used with the film, Prelude to War, the authors identified four attitudes and the belief areas which showed a correlation with expression of the desire to "get into the real fighting soon": (1) a conviction that war was inevitable; (2) a belief that we should seek freedom for all countries; (3) resentment toward the enemy, and (4) respect for enemy strength. The second finding was that the greater the degree of conviction in each of the first three areas identified in the first finding above, the greater the percentage of men expressing a desire to get into the fighting war soon. The fourth area, respect for enemy strength, correlated negatively with the desire to get into the fighting war; that is, the stronger the respect for enemy strength, the smaller the percentage expressing the desire to get into the fighting. (Another set of data reported by Hovland, et al., with reference to the relation between military motivation and specific attitudes and opinions has a direct bearing on the rationale of films and motivational changes.) The third finding reported was that there was a marked relationship between favourable opinion on the items listed with the first finding above and preference for the role of the soldier over that of a civilian, among 13,000 trainees.[49]

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[49] Hoban and Van Ormer, op. cit., pp. 5-8-5-9.

Effects of orientation programs on military motivation. Hovland, Lumsdaine and Sheffield Study. In a study of the effects of orientation programs (not just the effects of the films) on military motivation between April and August, 1944, Hovland, et al., attempted to measure the change in opinion score resulting from a regimental orientation program. The quantity and direction of change in opinion was then compared with the quantity and direction of change in preference for the role of the soldier over that of a civilian. They concluded that motivation decreased independently of opinion change.[50]

Stouffer, Suchman, Devinney, Star and Williams Study. The conclusions of S. A. Stouffer, E. A. Suchman, L. C. Devinney, S. A. Star and R. M. Williams, Jr. (1949) may be applied to the hope expressed by Hovland, et al., - that certain opinions might be changed by more effective methods and that such changes would influence motivation of soldiers to better accept their role.

They concluded that: (1) strong convictions aid esprit decorps; (2) cause-effect evaluation may often be misleading, and (3) few opinions change as a direct result of an orientation-type program.[51]

b. Influence of films on social attitudes.

1. Effects of films on specific attitudes. Thurstone and Peterson Study. The "classical" studies of the effects of motion pictures on social attitudes are those conducted by L. L. Thurstone and R. Peterson

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[50] Ibid., p. 5-10.

[51] Ibid., p. 5-11.

in connection with the Payne Fund studies (1933). The studies included measurement of the effects of then-current entertainment films on attitudes toward Negroes, Chinese, Germans, crime and criminals. The effects of single films, the cumulative effects of more than one film and the persistence of these effects were studied. It was reported that: (1) the film Birth of a Nation produced unfavourable attitude toward negroes; (2) the film Sons of Gods produced favourable attitudes toward Chinese; (3) the film Four Sons increased favourable attitudes toward Germans; (4) films tended to intensify anti-war attitudes, and (5) film effect were cumulative and persistent.[52]

Jones Study. V. Jones (1936) investigated the infuence of motion pictures on moral values, standards or attitudes as a part of a large study of character and citizenship in the public shcools. He found as did other experimenters in the field that motion pictures changed the attitudes of pupils "on the test items connected with the pictures in precisely the direction which one would expect from the nature of the films. If an act was condemned, the children became more severe in their judgment of it: if an act was excused or applauded, the children tended to excuse or praise" (p. 359). He also found some evidence that, "somewhat larger changes were found in the direction of lowered or less rigid standards of conduct than in the direction of higher or stricter standards" (pp. 359-360).[53]

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[52]Ruth C. Peterson, and L. L. Thrustone, Motion Pictures and the Social Attitudes of Children (New York: The Macmillan Company, 1933), pp. xvii-75 and v-142.

[53]Hoban and Van Ormer, op. cit., p. 5-15.

Effects of documentary films on specific attitudes. Ramseyer Study. L. L. Ramseyer (1938) studied the attitudinal effects of U. S. Government motion pictures dealing with soil erosion and with the Works Progress Administration (WPA) program. The films used included The Plow that Broke the Plains and The River, produced by the U. S. D. A; and Work Pays America and Hands produced by the WPA. It was found that: (1) films produced favourable attitudes toward the WPA; (2) the films produced support for Federal help in Erosion prevention and control, and (3) films had largest effects on students (of techniques tried).[54]

2. Effects of films on general attitudes. Shuttleworth and May Study. The second part of F. K. Shuttleworth and M. A. May's study dealt with measurement of attitudes which, sometimes, are attributed to the kinds of entertainment movies that children and adults see. It was concluded that: (1) films had few effects on general attitudes, and (2) movies tend to reinforce existing attitudes.[55]

Effects of informational films on general attitudes. Wilson and Larson Study. E. C. Wilson and L. C. Larson (1940) studied the effects on general attitudes of a series of films dealing with events leading up to World War II. The films were used in the course in current history at the General College, University of Minnesota. It was concluded that after the several weeks of instruction in current history, the film

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[54] Ibid., pp. 5-15-5-16.

[55] Ibid., pp. 5-16-5-17.

group showed no reliably greater change that could be attributed uniquely to the particular films used.[56]

Bell, Cain and Lamoreaux Study. In the R. Bell, L. F. Cain and L. A. Lamoreaux (1941) study, the generality of the attitudes measured is relatively clear-cut. They used the Progressive Education Association Scale of Beliefs which covered the subtopics of (1) democracy, (2) economic individualism, (3) labour and unemployment, (4) nationalism, (5) race and (6) militarism. It was found that there was a positive difference in informational gains in favour of the film groups in all grades tested, but this difference was reliable in grades seven and eleven only and most reliable in grade eleven.[57]

c. Influence of films on opinions. Hovland, Lumsdaine and Sheffield Study. In their studies on the influence of films on military motivation, Hovland, et al. (1949) obtained data which described the effects of these films on opinions. The findings were: (1) effects were greatest on opinions covered in films; (2) few changes in opinions occurred that were unrelated to the films; (3) effects had varying time stability; (4) general opinion effects increased with time; (5) more research was needed on time effects; (6) the effects on opinions varied with educational level, and (7) retention may reflect initial acceptance.[58]

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[56] Ibid., p. 5-17.

[57] Ibid., p. 5-18.

[58] Ibid., pp. 5-19-5-20.

d. Influence of films on cues (Stimulus)

1. Introductory sequences in visual demonstrations. Attempts to improve learning by manipulating stimulus conditions have generally met with more success than those that try to achieve the same end by infuencing the motivational variable. Inasmuch as it seems reasonable to expect that introducing an audience to the subject matter of visual demonstration should increase the amount that they learn from the demonstration, it is rather surprising to find that experiments on introductory sequences in visual and auditory demonstrations have met with mixed success and failure. Studies of methods of film utilization reported by Hovland, Lumsdaine and Sheffield (1949), by Wittich and Fowlkes (1946) and the Australian Office of Education (1950) indicated that an introduction increased the amount learned from a film.[59]

Concerning the value of introductory sequences, a study by Lathrop (1949) got conflicting results using three films with and without an introduction.

An experiment by Weiss and Fine (1955) suggested a way to more effectively use introductions to visual and auditory demonstrations. An experiment by Wulff, Sheffield, and Kraeling (1954) used a film on the selection and assembly of parts into an automobile distributor. They found that prior familarization training, either on film or employing the actual parts, reduced the number of errors in the selection of parts.

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[59] Cook, op. cit., p. 94.

In another experiment Wulff (1954) again used the assembly of an automobile distributor. Prior familiarization with the parts and their names were both found to be reliably superior to no familiarization. Interestingly enough, with regard to the selection time, prior familiarization with the parts proved to be significantly better than prior familiarization with the parts and their names. This latter finding corroborates the earlier results of Jaspen (1948) who found that requiring the audience to learn technical nomenclature of the parts did not improve performance on an assembly task. These two findings with regard to nomenclature suggest that people have individual ways of symbolizing objects to themselves.[60]

2. Relevant cues (cues that direct). An effective visual and auditory demonstration is one that will call attention to the relevant facts and let others fade into the background. Evidence of this is found in an experiment by Kimble and Wulff (1953). Using a sound film on the use of the slide rule, they found that a version of the film that incorporated cues to guide the audience in making correct responses produced superior learning.[61]

There is experimental evidence for effectiveness of particular visual devices for calling attention to important cues. Lumsdaine and Sulzer (1951) using a film on how to read a micrometer found that animation devices such as pop-in lables and moving arrows, produced a

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[60] Ibid.

[61] Ibid., p. 95.

marked increase in the amount learned from the film.[62]

As another method of focusing attention upon relevant cues in learning from films, slow motion has received very little research attention, especially with regard to perceptual motor tasks. However, an experiment by McGuire (1953) indicated that, in a simple perceptual motor task, slow motion had a slight tendency producing better learning. It may be that slowing down the action allowed more time for the audience to learn the important cues.[63]

3. Additional Stimuli. The general trend of the experimental findings would lead one to believe that extraneous stimuli, unless they focus attention on relevant cues, are not likely to be effective. An experiment by Neu (1950) found that inserting attention-gaining devices in a film (not attention-directing devices) did not improve performance. In a film demonstrating how to assemble the breechblock of a forty millimeter anti-aircraft gun, Jaspen (1950) found that providing background material that is not really relevant to the learning of the task at hand has similarly been found to be ineffective.[64]

Miller and Levine (1952) found that even use of such devices and titles have been found to be relatively ineffective in facilitating learning. This finding runs somewhat counter to the generally accepted theoretical expectation that if subtitles help to organize the material, they should therefore make easier to learn.[65]

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[62] Ibid.

[63] Ibid.

[64] Ibid., p. 96.

[65] Ibid.

One would also expect on theoretical grounds that the use of color in filmed visual and auditory demonstrations should be effective in those cases in which color provides an essential cue in the learning task, but while they may, in fact, be true, the experimental results obtained by Long (1946), McLean, (1930) and Vandermeer (1948; 1949), make it evident that it is impossible to say that color, in and of itself and regardless of anything else, facilitates learning from visual and auditory demonstrations.[66]

Narration has generally been found effective as an accompaniment of an otherwise purely visual demonstration, probably because the narration directs the eye movements of the audience. An early study by the McCluskeys (1924) found that, with pupils in grades five through eight, an oral commentary increased the effectiveness of motion pictures, slides and photographs. Einbecker (1933) found that use of a regular silent film with oral accompaniment on high school physics was superior to use of the regular silent film alone. Jaspen (1950) found a medium level of accompaniment (about a hundred words per minute) to be best. McGuire (1953) found in teaching a simple perceptual motor skill that a film plus narration produced reliably better results than did the film alone.[67]

4. Instructional Value of Films Comparing Them with Other Media and Methods of Instruction.

In reviewing silent film research for the present study, it was necessary to develop a classification system to identify different uses

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[66] Ibid.

[67] Ibid.

made of such films. The following silent film use classification scheme was set up for consideration:

1. One film shown alone as a lesson or unit (without usual methods)
2. One film shown together with comments (or study guide) as a lesson or unit.
3. One film shown without comments (or study guide), but together with usual methods as a lesson or unit
4. One film shown together with comments (or study guide), and with usual teaching methods as a lesson or unit
5. Two or more films shown alone as a lesson or lessons, unit or units (without usual methods)
6. Two or more films shown together with comments (or study guides) as a lesson or lessons, unit or units.
7. Two or more films shown without comments (or study guide), but together with usual teaching methods as a lesson or lessons, unit or units.
8. Two or more films shown with comments (or study guides), and with usual methods as a lesson or lessons, unit or units
9. Films used without comments (or study guides) and without usual teaching methods as a primary pattern for an entire course or courses.
10. Films used together with comments (or study guides), but without usual teaching methods as the primary teaching pattern for a course or courses.

11. Films used without comments (or study guides), but integral with regular methods in the teaching pattern used for a course or courses.

12. Films used with comments as integral with regular teaching methods in the teaching pattern used for a course or courses.

For the purpose of this study and the convenience provided, it became further necessary to develop a system for the classification of research which had been conducted comparing the uses of various silent films. The four headings selected include: (a) studies of one or more films (without comments or study guides) combined with the usual teaching methods used by an instructor compared with the usual methods used by the instructor; (b) studies of one or more films (with comments or study guides) combined with the usual methods used by an instructor compared with the usual methods; (c) studies of one or more films with or without comments (without usual methods) compared with other primary simple teaching methods such as demonstrations or lectures, and (d) studies of films used as the primary method of teaching a course or series of units compared with the usual teaching methods used by an instructor.

a. Studies of one or more films (without comments or study guides) combined with the usual teaching methods used by an instructor compared with the usual methods used by the instructor. By "usual methods" of instruction, is meant the instruction procedure which is usual for the particular teacher or teachers involved in the investigation but excluding the use of films. Usual instruction may consist of some form

of the assigned textbook-study and recitation formula, possibly including discussions, demonstrations and the use of blackboards and other illustrative materials. At times, though less frequently, usual instruction may consist of a more unified project or problem-type of guided learning with the student participating to some extent in the planning.

Wood and Freeman Study. B. D. Wood and F. N. Freeman (1929) undertook an extensive investigation under a grant from the Eastman Kodak Company to determine the contribution of silent motion pictures used as an integral part of classroom teaching procedure. One of their four objectives was to study the possible increase in factual learning which could be attributed to the films. Twenty silent films especially produced for classroom use, including a geography series for the fourth, fifth, and sixth-grade students and a general science series for junior high school students, were used in this study. Each films series was used during a ten week instructional period. Study guides and teacher guides were prepared for the use of both film and nonfilm groups. It was found on objective tests that the "film group" excelled the average of the "usual-methods" group. Similar superiority was found for the "film group" on essay-type tests.[68]

Davis Study. H. C. Davis (1932) made a study based on data which she took from four of the units of the Wood and Freeman study. It was concluded that the "film group" was superior in mentioning items shown in the film, and on items dealing with action or activity.[69]

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[68]Benjamin Wood and Frank N. Freeman, Motion Pictures in the Classroom (New York: The Houghton Mifflin Company, 1929), pp. 392.

[69]Hoban and Van Ormer, op. cit., p. 6-3.

Gatto Study. D. Gatto (1933) compared the effectiveness of motion pictures added to other visual aids (such as stereographs and slides) with that of supplementary reading in the teaching of fifth-grade geography classes. The visual aids were used as an integral part of the instruction. His results showed that the film group was superior in factual knowledge in both immediate and delayed testing five-weeks later.[70]

McCowen Study. M. C. McCowen (1940) studied the value of fifteen silent films in the teaching of two units of seventh-grade general science, and found that in the case of his two small groups the group in which films and slides were used gained more than the "non-visual" group. This was especially true in the unit in which eleven films were used as compared with the unit in which only four films were used.[71]

Wise Study. H. A. Wise (1939) used ten of the Yale Chronicles of America Photoplays in a study of the contribution of these silent films to the teaching of American history in the senior high school. Over 800 students in twenty-eight eleventh-grade history classes, taught by nine teachers in five towns representing a cross section of midwestern United States were originally tested. From this group were selected 218 pairs matched on sex, grade, teacher, IQ and initial score on a standardized American history test. Wise presents evidence that use of films produced small, but consistently higher gains in each of the

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[70] Ibid., p. 6-4.

[71] M. C. McCowen, "A Controlled Experiment in Visual Education in General Science," The Educational Screen, XIX (April, 1940), pp. 143-146 and 172-173.

units. In addition use of the films increased interest in places and personages, produced more voluntary reading and resulted in a slight tendency to rate the subject taught higher among other subjects studied.[72]

Montelbano Study. D. Montelbano (1941) found that seventeen teacher-produced silent films were definitely effective in teaching seventh-grade pupils the "informational," "psychological" and "social utility" aspects of mathematics. His experimental and control groups consisted of 212 pupils each in four New York City junior high schools.[73]

Dunkerley Study. G. Dunkerly (1941) studied the effectiveness of four silent films dealing with such things as the blood and the function of eyes, and found that the films were effective in producing more learning than obtained through use of usual methods.[74]

Hoefer and Keith Studies. C. Hoefer and E. Keith (1924) in one of the early Chicago experiments, studied the effect of silent films in teaching units on health to upper elementary grade pupils. In one study, 691 fifth-grade pupils in twenty-six different classes were used. Both experimental and control groups received oral instruction based on the film titles and made scrapbooks of picture illustrations of various points of the lessions. The authors state that the films were probably more

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[72]Harry A. Wise, Motion Pictures as an Aid in Teaching American History (New Haven: The Yale University Press, 1939), 187 pp.

[73]Hoban and Van Ormer, op. cit., p. 6-5.

[74]G. Dunkerley, "An Experiment with Films," Parts I and II, The Journal of Education, LXXIII (1941), pp. 306-308, 348-349.

entertaining than instructive for the pupils, thus suggesting the lack of differential effect.[75]

Freeman and Hoefer Study. F. N. Freeman and C. Hoefer (1931) report a study with 207 fifth and sixth grade pupils on the effectiveness of two silent films on care of the teeth. Groups were matched on intelligence and on an information pre-test. It was found that the films produced no greater increase in information. But the films were found to be more motivational than informational.[76]

b. Studies of one or more films (with comments or study guides) combined with the usual methods used by an instructor compared with the usual methods. In this part, the teaching effectiveness of the film, used by itself, will be compared with that of the usual combination of teaching methods. Here, "usual" methods do not include other projected visual media, such as filmstrips or slides. The studies cited here do not evaluate films against one specific medium, such as, lecture, assigned reading, demonstration or printed booklet.

Shephard Study. J. W. Shephard (1922) in one of the early experiments on the effectiveness of films, saw the possibilities of the film alone as a "teacher". Out of the two studies he conducted, he found in the first study the film to be almost as good as the superior teacher and slightly better than the average teacher. In the second study he

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[75]Carolyn Hoefer and Edna Keith, "An Experimental Comparison of the Methods of Oral and Film Instruction in the Field of Health Education, Visual Education, F. N. Freeman, editor (Chicago: University of Chicago Press, 1924), pp. 346-376.

[76]Frank N. Freeman, and C. Hoefer, "An Experimental Study of the Influence of Motion Picture Films on Behaviour," The Journal of Education Psychology, XXII (September, 1931), pp. 411-425.

found that the film had a reliable and sizable advantage over both average and superior teachers, with a slight tendency for the superior teacher to have the advantage over the average teacher.[77]

Rosenthal Study. N. H. Rosenthal (1945) in charge of visual education for the Royal Australian Air Force, reported a study comparing films and an instructor. It was concluded that of those who were trained with both film and instructor, ninety percent "passed". The effectiveness of the film was most pronounced in reducing the number of very low scores on the test. Those who had seen the film drew diagrams to illustrate their answers, thus showing their clearer understanding of the principles.[78]

Vernon Study. The study of P. E. Vernon (1946) on teaching British seamen to take soundings found that an hour's film was as effective as three hours of relatively weak oral instruction.[79]

c. Studies of one or more films with or without comments (without usual mtehods) compared with other primary single teaching methods such as demonstrations or lectures. The lectures and demonstrations described in this section are of the type usually given for the particular subject matter. The subject matter in this section is primarily in the area of sciences, and the accompanying lectures and demonstrations are designed to facilitate factual and conceptual learning.

James Study. The major part of the study by H. W. James (1924) was the comparison of learning from a film with learning from a lecture.

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[77]J. W. Shephard, "The teaching Efficiency of the Film," The Educational Screen, I (June, 1922), pp. 176-180.

[78]Hoban and Van Ormer, op. cit., p. 6-12.

[79]P.E. Vernon, "An Experiment on the Value of the Film and Filmstrip in the Instruction of Adults," The British Journal of Educational Psychology, XVI (November, 1946), pp. 149-162.

The lecture had been prepared to duplicate the film as closely as possible even to the extent of using the wording of the film titles to supplement the other comments, and requiring the same amount of presentation time. Six different films were all studied in this way using as subjects groups of eight-and/or ninth-grade pupils in the city of Detroit. The author had found an advantage in favour of film presentation over a lecture presentation for two of the three films. He also concluded that films approximate concrete experience.[80]

Lapp Study. C. J. Lapp (1939) compared the film Electrostatics, shown twice with intervening comments by the instructor to direct attention to certain points before the second showing with "a superior type lecture" of fifty minutes duration on the same material. Both classes (in college physics) were asked to read the textbook covering the same material. A difference was obtained in favour of the film group. This difference, however, is probably not reliable because of the small size of the groups involved, but the investigator does not report enough data to check the reliability.[81]

Gibson, Borin, Orvis and Gagne Study. The J. J. Gibson et al., study reported in 1947, states that the test given immediately after the instruction showed that the film, which lasted half as long as the other two media, produced reliably better learning, and was about equally superior

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[80]H. W. James, "The Relative Effectiveness of Six Forms of Lesson Presentation: Film, Lecture, Still Picture, Film-Lecture, Film Music and Reading, with Particular Emphasis on the Suitability of Different Types of Material for Film Presentation," Visual Education, F. N. Freeman, editor (Chicago: The University of Chicago Press, 1924), pp. 190-228.

[81]Hoban and Van Ormer, op. cit., pp. 6-21.

to the other two methods. After two months time the superiority of the film group was maintained.[82]

d. Studies of films used as the primary method of teaching a course or series of units compared with the usual teaching methods used by an instructor. The demonstrated effectiveness of films in certain situations leads to the question: How much learning will result if almost all of the instructional material in an entire course is presented by means of films instead of the usual process based on lectures, demonstrations, discussions and assigned reading? Several studies which relate to this question are presented in this section.

Mount Study. J. N. Mount's study (1931) involved the use of fifteen silent films in five units of high school physics. It was found out that, in the case of the two small groups studied, there was a slight superiority for the film groups in three of the five units; the fourth unit was clearly in favour of the supplementary-reading group; the fifth unit showed no significant difference between the methods.[83]

McCowen Study. M. C. McCowen (1940) compared the value of fifteen silent films combined with slides and the usual teaching techniques with a control group which saw no films or slides, in teaching two units of seventh-grade science. He found that in the case of his two small groups, the group that saw the films and slides gained more than the control group.[84]

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[82] Ibid., p. 6-22.

[83] Ibid., p. 6-23.

[84] M. C. McCowen, "A controlled Experiment in Visual Education in General Science," The Educational Screen, XIX (April, 1940), pp. 143-146 and 172-173.

Montelbano Study. D. Montelbano (1941) studied the effectiveness of seventeen teacher-produced silent films when used in combination with usual methods. The extensive use of films resulted in reliable gains in the film-taught groups in the "informational," "pyschological" and "social utility" aspects of mathematics. "Computational" skills were only slightly improved. In other words, the films were effective, but only with reference to their specific content.[85]

5. Audience Characteristics.

The reaction of an audience to a motion picture is intimately related to what the audience brings to the motion picture as well as to what the motion picture brings to the audience. Contrary to rather widely-held, popular opinion, communication by motion picture is not a mechanical transfer of information. Reactions are dynamic. They involve interaction of the audience with the content and technique of the film. In this part the factors which operate in individuals in the audience to condition their responses to films will be dealt with in terms of: (a) predispositions brought to the film; (b) the social role or roles of individuals in the audience, and (c) their intellectual abilities, education and training.

a. Individual predisposition factors in audience response. An individual approaches any motion picture experience with a number of predispositions which may influence his reaction to the film. His likes

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[85] Hoban and Van Ormer, op. cit., pp. 6-23-6-24.

and dislikes, his preferences for one kind of film story over another and his general interest in the topic of the film are part of the mental set with which he approaches a film. The problem is the extent to which such audience predispositions influence reactions to films, under what circumstances they operate and over what period of time they will continue. Studies having implications for this problem are summarized below.

(1) Acceptance and Predisposition to acceptance. Holaday and Stoddard Study. P. W. Holaday and G. D. Stoddard (1933) observed the types of information accepted by motion picture audiences. He concluded that audiences accept both true and false information.[86]

Hovland, Lumsdaine and Sheffield Study. C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield (1949) recognized the factor of "acceptance" in their study of the influence of the Why We Fight films on opinions of a military population in World War II, and they concluded that opinion change depends on acceptance.

The most relevant experimental evidence of the effect of predisposition is contained in the analysis by C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield of the long-time effects of fifteen opinion items "significantly" influenced by the film, The Battle of Britain. The authors concluded that predisposition effects appear on long-time tests.[87]

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[86] Ibid., p. 7-2.

[87] Ibid., p. 7-2-7-3.

2. Likes and dislikes. Like and dislike of a film appears to be another factor in individual reactions to instructional films and seems related to the direction of film effects or influences. The experiments conducted in this area are summarized below.

Hovland, Lumsdaine and Sheffield Study. C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield (1949) investigated the changes in eleven items of opinion after showing The Battle of Britain to soldiers who indicated on a questionnaire whether they "liked" or "disliked" the film. The authors concluded that some correlation appeared between "Like" and favourable change.[88]

Sackett Study. The relationship between an individual's dislike of something in a film and his judgment of the educational value of the entire film is evident in data assembled by R. S. Sackett (1942). Sackett analyzed student ratings of 500 films used in the film evaluation project of the American Council on Education. He concluded that specific dislike affects the rating of the entire film.[89]

Ash Study. P. Ash (1949) in a study conducted under the auspices of the Instructional Film Research Program, touched upon these problems to some extent in investigating the relative effectiveness of massed versus spaced film presentations. He found that (1) there was little correlation between interest and gains; (2) higher correlations appeared in a second series; (3) massed presentation was least popular in the

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[88] Ibid., p. 7-6.

[89] Ibid.

more complex series; (4) spaced-presentation scores were higher in the complex series; (5) there was little relation between interest and learning, and (6) trainees had little intrinsic motivation to learn.[90]

Heidgerken Study. L. E. Heidgerken (1948) while comparing the effectiveness of sound films, filmstrips and films and film-strips combined collected some data on the students' opinions on the value of the filmic teaching aids and on the desirability of using similar films in teaching other units of a course. It was concluded that the preferred medium gave no better scores.[91]

Vandermeer Study. A. W. Vandermeer (1948, 1949) in his study of the effectiveness of color films with ninth-grade science students, obtained a measure of "liking" for the films as one of his evaluations. It was concluded by the author that students prefer films in color over identical films in black and white.[92]

Westfall Study. L. H. Westfall (1934) conducted a study of the effectiveness of different types of verbal accompaniment for instructional films. This investigation has as a secondary phase a measure of likes and dislikes for different types of verbal accompaniment. The following findings were obtained: (1) Recorded-sound version was preferred; (2) more learning occurred from Recorded-Sound version of sound films, and (3) score differences were smaller than preference differences.[93]

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[90] Ibid., pp. 7-7-7-8

[91] Ibid., p. 7-9.

[92] Ibid.

[93] Ibid., p. 7-10.

b. Social factors in audience response. This section summarizes other research data on the challenging problem of the relationship of social role assignment to reactions to film in terms of: (1) religion; (2) sex; and (3) age and grade level.

1. Religion role. J. Kishler (1950) conducted an experiment (an exploratory study of the possible effect of identification in film learning) of the Instructional Film Research Program that has some bearing on the audience characteristic of role ascription. He concluded that role ascription had little influence in film learning.[94]

2. Sex role. C. F. Hoban, Jr. (1942) investigated the difference in mean rating of the educational value of instructional films among boys and girls in analyzing reports of student reactions to films shown in elementary and high schools in connection with the American Council on Education's nation-wide evaluation of motion pictures in general education. He concluded that sexes differ in rating the educational value of certain films.[95]

H. R. Brenner, J. S. Walter and A. K. Kurtz (1949) in their study of the value of questions and statements inserted in a film found some evidence of sex differences in response to film content and to special learning aids inserted in the films.

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[94] Ibid., p. 7-13.

[95] Ibid., p. 7-14.

A. W. Vandermeer (1950) also provides data on learning differences between boys and girls. These experiments gave the result that boys learn more than girls from certain films on science and mechanical processes.[96]

H. A. Wise (1939) in his study of the Yale Chronicles of America Photoplays, found some evidence of a sex difference in the effectiveness of the silent films as aids in teaching American History in senior high schools. He found that films are more beneficial to boys than girls in one investigation in American History.[97]

Some differences in the physiological indices of emotional responses to entertainment films among males and females were reported in the W. S. Dysinger and C. A. Ruckmick study. Similarly some sex differences in testimony regarding the effect of films on emotions and attitudes was reported by H. Blumer (1933) in his study of "movie biographies".[98] In another study by M. V. Seagoe (1931) it was found that, among ten to twelve year olds, boys tend to prefer more thrills and excitement than girls, who are more interested in romantic situations in films.[99]

3. Age role. In every culture, people, including children are "age-graded" (treated a certain way because of their age and certain

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[96] Ibid.

[97] Ibid.

[98] Ibid., p. 7-15.

[99] M. V. Seagoe, "The Child's Reactions to the Movies," The Journal of Juvenile Research, XV (1931), pp. 169-180.

things expected of that age); this social phenomenon of age-grading affects a person's behaviour as he assumes an age role.

H. E. Jones, H. Conrad and A. Horn (1928) had reported that the ability to learn factual material from films, under ordinary motivation, becomes greater as age increased, until a peak is reached in the early twenties. This ability is maintained nearly at peak level until the age of about forty-five when a gradual decline begins, becoming more pronounced after the fifties.[100]

A. M. Mitchell (1929) as a result of his investigation, reported that preferences for various types of motion pictures vary with age and tend to parallel those for reading and radio listening and show the same sex differences.[101]

In another study, conducted by W. E. Blatz (1936), it was found that, among Toronto children up to thirteen years of age, comedy is the first choice, followed by mystery and musical comedies. The type of comedy having the most appeal was the "slapstick" variety.[102]

P. Witty, S. Garfield and W. G. Brink (1941) in their study of the movie preference of 350 high school pupils in Chicago found that the first three choices for the boys, in descending order of preference, were comedy, mystery and westerns, with news, cartoons and gangster films ranking

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[100]H. W. Jones, H. Conrad and A. Horn, "Psychological Studies of Motion Pictures: II Observation and Recall as a Function of Age," University of California Publication Psychology, III (1928),pp. 225-243.

[101]Hoban and Van Ormer, op. cit., p. 7-16.

[102]Ibid.

approximately equal for least popularity.[103]

c. Intellectual factors in audience response. This part will be dealt with under two headings: (1) the effects of intelligence and educational level, and (2) the effects of previous knowledge and training.

(1) Effects of intelligence and educational level. Secor, Smith, Wittich and Fowlkes Study. Studies conducted by C. T. Secor (1931), H. A. Smith (1948), and W. A. Wittich and J. G. Fowlkes (1946) indicate that there is high correlation between the intelligence level of the viewer and resultant learning from films.[104]

Gibbs Study. D. Gibbs (1925) compared the usual textbook-recitation method with two ways of supplementing teaching with a film, in teaching the topic of digestion to seventh-grade pupils of three different cities. In the experiment the author, divided his subjects into upper (highest) and lower (lowest) fourths in intelligence. It was concluded that the three high quarter groups learned more in all situations than the three low quarter groups. Film groups in both quarters learned more than non-film groups. The use of the film brought the per minute score of the low quarter up somewhat, but by no means equal to the upper quarter.[105]

Tilton and Childs Study. J. W. Tilton and A. R. Childs (1933) studied the effectiveness of the Yale Chronicles of America Photoplays in teaching history to three different groups of adults. It was found

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[103]Paul Witty, Sol Garfield and William G. Brink, "Interests of High School Students in Motion Pictures and Radio," The Journal of Educational Psychology, XXXII (March,1941), pp. 176-184.

[104]Hoban and Van Ormer, op. cit., p. 7-18.

[105]D. Gibbs, "An Experiment as to Economy of Time in Instruction by Use of Motion Pictures," The Educational Screen, IV (November,1925), pp. 520-526.

that the gains of the three groups were roughly in direct proportion to their schooling and ability. What the "illiterate" group learned about American History, when compared with the initial testing of the other groups, was shown to be information normally acquired by persons who attend school up through the middle of the fifth grade.[106]

Terry Study. L. G. Terry (1932) analyzed some of the data from D. C. Knowlton and J. W. Tilton Study (1929) with the Yale Chronicles of America Photoplays. She found that bright pupils responded in teacher-led class discussions more frequently than less bright students with four out of six film studies.[107]

Jones, Conrad, and Horn Study. One of the earliest investigations of intelligence and film learning was that conducted by H. E. Jones and his associates H. Conrad and A. Horn (1928). They found that specific reactions to the content of motion pictures were related to the degree of intelligence possessed by the individuals.[108]

Hovland, Lumsdaine and Sheffield Study. On the adult level, where mental maturation was presumed to have approached its upper limits, C. I. Hovland, A. A. Lumsdaine and F. D. Sheffield (1949) established what they identified as a linear relationship between informational learning from motion pictures and both intelligence and level of education, re-

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[106] J. W. Tilton and Arney R. Childs, "The Use of the Yale Photoplays in an Elementary School for Adults," Educational Method, XIII, (November, 1933), pp. 71-75.

[107] Hoban and Van Ormer, op. cit., p. 7-21.

[108] Jones, Conrad and Horn, loc. cit.

gardless of the difficulty of the material. They also found that misinterpretation decreased among the better educated.[109]

(2) Effects of previous knowledge and training. In the above mentioned Hovland, Lumsdaine and Sheffield study, the effect of educational background on film learning was analyzed. Evidence was introduced to indicate that the percentage of new material learned from the film increased with the percentage of knowledge of the subject prior to the film showing. However, prior knowledge and film learning were correlated with educational level in the analysis, and no data were presented on the effect of prior knowledge, with educational level and learning ability held constant.[110]

Larson Study. L. C. Larson's (1940) study dealing with resistance to propoganda presented in films was concerned with specific attitudes, but introduced general factors of resistance to specific attitudinal change resulting from propoganda presentation. He concluded that the students enrolled in the course on the formation of public opinion are not immune to propoganda.[111]

Vandermeer Study. A. W. Vandermeer (1949) investigated the possibility of learning from films exclusively. One of his conclusions was that film experience aided subsequent film learning.[112]

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[109] Hoban and Van Ormer, op. cit., 7-22.

[110] Ibid., p. 7-23.

[111] Ibid., p. 7-24.

[112] Ibid., p. 7-26.

Principles governing the influence of films. Following is a listing of principles governing the influence of films which have been delineated in preceding paragraphs.

(1) Films have greatest influence when their content reinforces and extends previous knowledge, attitudes and motivations of the audience. They have least influence when previous knowledge is inadequate and when their content is antagonistic or contrary to the existing knowledge, attitudes and motivations of the audience.

(2) The influence of a motion picture is more specific than general.

(3) The influence of a motion picture is greater when the content of the film is directly relevant to the audience reaction that it is intended to influence.

(4) Reactions to a motion picture vary with most or all of the following factors: film literacy; abstract intelligence; formal education; age; sex; previous experience with the subject, and prejudice or predisposition toward the subject.

(5) The influence of a motion picture depends primarily on the strength of its visual presentation, and secondarily, on the value of the narration or commentary that goes with it. It is relatively unaffected by "slickness" of production as long as the meaning is clear.

(6) An audience responds selectively to motion pictures, reacting to those things which it finds familiar and significant in the pictorial context in which the action takes place.

(7) Individuals respond to a motion picture most efficiently when the pictorial content is subjective for them.

(8) Rate of development influences the instructional impact of a motion picture on its audience.

(9) Established instructional techniques, properly built into the film or applied by the instructor, substantially increase the instructional effectiveness of a film.

(10) The leadership qualities of the instructor affect the efficiency with which his class will learn from the film or filmstrip.

Values of instructional films. The values of instructional motion pictures as indicated in the research studies are also given below.

(1) People learn from films. They can learn factual knowledge, concepts, motor skills, attitudes and opinions.

(2) When effective and appropriate films are properly used, people learn more in less time and are better able to retain what they have learned than when less effective and ineffective techniques are used.

(3) Instructional films may stimulate other learning activities.

(4) Certain films may facilitate thinking and problem solving.

(5) Appropriate, well-prepared films are equivalent to at least an average teacher and sometimes even to an excellent instructor insofar as the instructor's function is communicating the facts or demonstrating the procedures presented in the film.

II. FILMSTRIPS AND SLIDES

Filmstrips and slides are among the most economical of visual materials; therefore, their effectiveness as compared with the more expensive motion pictures has frequently been studied. Early studies by Brown (1928), James (1924), McClusky (1924) and McClusky and McClusky (1924), comparing filmstrips and slides with the silent motion picture found in general that the projected still pictures were about as effective in teaching factual information as silent films.[113]

Later studies comparing filmstrips and slides with sound motion pictures supported these earlier findings. Goodman (1942) compared sound and silent filmstrips with sound and silent motion pictures in teaching four safety topics to grades six and seven pupils, finding no significant differences among the four methods when pupils were tested a month after lessons.[114]

Carson (1947) reported a study made by the Scottish Educational Film Association in which long and abbreviated versions of a filmstrip on American Cowboys were compared with a sound film on the same subject. As measured by forty item true-false and multiple choice tests, the two filmstrip groups were greatly superior to the sound film groups in learning information and concepts.[115]

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[113] William H. Allen, op. cit., p. 120.

[114] David J. Goodman, "Comparative Effectiveness of Pictorical Teaching Materials," The Educational Screen, XXI (November, 1942), pp. 358-359 and 371.

[115] Hoban and Van Ormer, op. cit., p. 6-26.

Vernon's (1946) experiment in teaching British Seamen to comprehend and learn facts about taking soundings with a lead line found the filmstrip and film to be about equal in value, with a great advantage enjoyed by the method that combined the two techniques.[116]

Gibson (1947) compared a group instructed through films with a lecture group for which the lectures were organized around a series of nineteen slides and with a group that read a well-written and well-illustrated booklet on the air-trainee subject of position firing. The film group learned significantly more facts, the lecture and the manual groups achieving about the same.[117]

Heidgerken (1948) found no differences among filmstrips, motion pictures and filmstrips combined when compared, with motion pictures in teaching units in a course of nursing arts. Hovland (1949) and others compared the effectiveness of an Army training film on map reading with an Army filmstrip that presented the same content. Army Quartermaster trainees, tested by a thirty-nine item verbal and visualized test, learned slightly but not reliably more from the filmstrip.[118]

Anderson and others (1951) compared three methods of teaching spelling in grades three to five: the Newlon-Hanna method, the pupil-coach method and a so-called multisensory method which used projected slides of the words. As measured by retention tests three months later,

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[116]P. E. Vernon, "An Experiment on the Value of the Film and Filmstrip in the Instruction of Adults," The British Journal of Educational Psychology, XVI (November, 1946), pp. 149-162.

[117]William H. Allen, loc. cit.

[118]Ibid.

the three methods were about equal in effectiveness, with an advantage to the multisensory method in grade three. Abramson (1952) studied the relative effectiveness of two methods of teaching a year course in elementary mechanics to students in a large city high school where various socio-economic factors produced a general lack of interest in school work. He studied the value of the standard method of instruction (which combined recitation, demonstration, film, supervised study, and the laboratory exercises) with a method using the projection of pictorial ideographs as slides, each slide followed by several "thought" questions which focussed on certain elements and relationships in the slides. Achievment was measured by specially prepared tests given immediately and two months later. The slide group achieved significantly more learning than the control group on all three units of instruction on both immediate and the two-month retention tests.[119]

Stampolis and Sewell (1952) compared the use of four filmstrips with lectures in teaching economics concepts to university students, the filmstrip method proving significantly superior to the lecture method in one case. Helliwell (1953) investigated the values of the filmstrip and the field trip in teaching factual knowledge of the Dairy and the Newspaper to fourteen and fifteen year old students in England. The field trip method was found to be greatly superior to the filmstrip, but the combination of the two methods was the most effective of the three.

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[119] Ibid., pp. 120-121.

Slattery (1953) compared the effectiveness of the filmstrips with sound films in the informational and conceptual learning of grade five social studies. She found the filmstrips, both with and without student participation, to be significantly superior to the sound motion pictures. Lasser (1954) tested the effectiveness of a filmstrip versus a film in teaching a simple preformance task of repairing a broken sash cord in a window. No significant differences were found except for one sub-operation on which the film group did much better, presumably because the film had continuity. On several operations neither medium was effective. Torkelson (1954) studied mockups, training-manual illustrations alone, cutaways and projected black and white and colored transparancies as aids in teaching the nomenclature and functioning of certain types of naval ordnance to NROTC students and naval trainee recruits. Although the three-dimensional mockups and cutaways produced superior learning, the differences were so small in proportion to their high cost that their general use appeared to be unjustified. Kale and Grosslight (1955) studied the learning of Russian Vocabulary under several conditions, including pictures plus titles versus titles only, motion versus still pictures, and sound versus silent pictures. They found that: (1) pictures of an object or act were an aid to learning vocabulary; (2) still pictures were as effective as moving pictures, and (3) pronunciation of the words by a narrator seemed to inhibit learning to write the words.[120]

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[120] Ibid., p. 121.

Zuckerman (1954) demonstrated how a reproduction filmstrip of the rough "story-board" for a training film could be used to predict the relative learning that would result on the completed film. In "The Healthy Village" a report on the visual education experiment in West China conducted by UNESCO (1951), the general value of visual and auditory materials in teaching health principles to partially literate rural population was pointed up. Filmstrips and slides were considered the most effective means used in reaching large numbers of people and in making lasting impressions. Vergis (1954) found that addition of the third dimension to colored slides had no significant effect upon grade five students' learning of factual information that was not dependent upon depth cues for understanding. However, the 3-D slides were greatly superior in influencing the interpretation of size and form of objects in space. He concluded that the types of pictures best suited for 3-D projection are those that are specially chosen to communicate certain special spatial concepts. Butts (1956) studied the comparative effectiveness of captions on slides. He found that declarative and imperative captions were significantly superior to interrogative captions in helping students learn and retain information.[121]

On the basis of their review of the research on filmstrips and slides, Hoban and Van Ormer (1950) concluded that the superiority of the motion picture probably resulted from the greater adaptability of movies

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[121] Ibid.

for portraying interacting events, whereas the superiority of the filmstrips was probably due to the slower rate of development used in the actual presentation of the filmstrip to the audience.[122]

Zyve (1932) analyzed the relative effectiveness of lantern slides as a device for teaching arithmetic combinations as compared with the use of the blackboard. Under conditions existing in this experiment, she concluded that: "Two days of teaching arithmetic combinations with the lantern slides gave approximately the same results that three days' teaching gave when using blackboard presentations."[123]

T. H. Parks (1940) studied the value of visual aids as rated by the entomologists in teaching. Phases studied were selection of projects; division of specialists' time, including time given to emergency and long-time projects and to public relations and contacts; cooperating agencies, and methods of instruction. Summary disclosed that entomologists from twelve states placed slidefilms first or second in usefulness, which enabled this form of projection to exceed lantern slides. Motion pictures ranked third. Respondents from six states placed cartoons and blackboard drawing first.[124]

In a study of filmstrips and their effectiveness conducted by the AAF, an effort was made to assess the attitudes of instructors toward this

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[122] Ibid.

[123] Claire T. Zyve, "Experimental Study of Teaching of Arithmetic Combinations," The Educational Method, XII (October, 1932), pp. 16-18.

[124] What Research Shows About Visual Aids, op. cit., pp. 32-33.

type of training aid and to collect information indicative of more efficient means of filmstrip utilization. One questionnaire was given to thirty eight training-aids officers and another questionnaire to 1,500 instructors in thirty eight different training installations. The conclusions may be summarized to include the following: (1) a large percentage of training-aids officers and instructors indicated confidence in filmstrips as a major aid in teaching; (2) practically all instructors and training-aids officers indicated a real desire to use filmstrips more extensively in training; (3) instructors were making only a partial use of available strips, primarily because of improper partices used in selection and integration of filmstrips into courses of instruction; (4) instructors and training-aids officers lacked training and experience in the use of visual aids and in teaching; (5) techniques and practices in selection and integration of filmstrips into the curriculum fell short as judged by generally-accepted practices and criteria, and (6) the nonuse and/or disuse of filmstrips was caused primarily by short-coming and defects in application of filmstrips to training problems. The most significant conclusion of this study was that instructors tend to indicate a belief in the value of filmstrips, and yet do not use them effectively.[125]

Miles and Spain (1947) reported on a study made by the Signal Corps using two types of sound slidefilms designed to teach Signal Corps

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[125]John R. Miles and Charles R. Spain, Audio-Visual Aids In The Armed Services (Washington D. C: American Council on Education, 1947), pp. 63-64.

men the phonetic alphabet. The only difference between the two was that one required the audience to recite aloud at certain points. The audience-participation group proved superior to the non-participation group. Other conclusions were, that audience participation is especially valuable in getting across information if "(1) the material is difficult to grasp, (2) the men have little motivation to learn, or (3) the audience is composed of men on the lower-intelligence levels."[126]

Cannon Hearne (1932) studied the factors that affect the influence of the meeting as a means of extension teaching. Data were obtained by field survey and by questionnaires answered in meetings. The subject was treated under three major headings: (1) factors affecting attendance at meetings, (2) influence of various presentation methods of adoption of practices, and (3) relative effectiveness of day and night meetings. The second most important problem concerned the comparative effectiveness of various methods of presenting subject matter at a meeting. It was concluded that the lecture supplemented by a suitable, well-made slidefilm was the most effective method of the five studied. This method was 1.55 times more effective than the lecture-alone method, thirteen percent better than the chart, twenty-seven percent more effective than the added use of a local leader and thirty-four percent ahead of the discussion type of presentation.[127]

Gerald McKay (1945) extension visual aids specialist in Minnesota, conducted a study of the uses made of visual aids by the agricultural extension service in thirty-eight states. He states that at that time most

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[126] What Research Shows About Visual Aids, op. cit., p. 33.

[127] Ibid., pp. 34-36.

emphasis was being placed on 2" x 2" kodachrome slides. In summarizing the answers to the twenty-two questions, the following conclusions pertinent to alidefilms were drawn: (1) most emphasis is being placed on building 2" x 2" kodachrome sets for distribution to the agents. There is a trend toward making these loan sets flexible enough so that each agent may add his own local picture to the set (2) slidefilms are, to a large exent being displaced by 2" x 2" kodachrome slides, but slidefilms still have their place in such work as photographing charts, graphs and drawings.[128]

A summary of principles of use of filmstrips and slides. The listed below, principles then, have been found to govern the influence and value of filmstrips and slides.

(1) Filmstrips and alides are an effective means of communicating factual information and certain skills. However, a combination of these media with sound films or other materials is usually superior to any one medium alone.

(2) The extent to which filmstrips or slides embody unique pictorial content of good quality has a direct bearing on their effectiveness in teaching.

(3) The filmstrip is easy and convenient to use, takes up little space and is easily stored, is inexpensive, is available either in color or black and white and can be used at any desired place because the pictures can be left on the screen as long as the instructor desires, the last point being of particular significance in many teaching situations.

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[128] Ibid., pp. 30-31.

(4) Other advantages of filmstrips which have a bearing on their usefulness in instruction are: the pictures are in sequence; the room needs to be only slightly darkened, and they are, in most cases, available for a wide range of grade levels and subject areas.

(5) The sequential order and unity of the filmstrip constitute one of its principal instructional characteristics.

(6) To secure effective results, the instructor must first select filmstrips which tell their story primarily through pictures rather than words. Second, the pictures selected must be of such nature and quality as to contribute something at once significant and unique to the learning situation.

(7) Slides and filmstrips are still picture media; they are of great value in visual teaching situations when motion is of little or no importance of comprehension.

(8) They are inherently suited to the convenient presentation of a great variety of visual materials such as pictures, cartoons, charts, graphs, diagrams, maps and tables. Virtually anything that can be photographed can be put on a slide.

(9) Both have attention-focusing power of any projected image.

(10) Both can be made locally, though slides are much more easily prepared than filmstrips.

(11) Rate of development and level of verbalization (as in narration or comments) varies in filmstrip.

(12) Static subject matter can be treated extremely well with slides. Slides allow for an extended discussion of any subject that demands it.

(13) Film and filmstrip comparisons involve many variables, and the content and pictorial techniques vary in both media.

III. EXHIBITS

G. M. Frier and L. M. Busche (1941) studied the interest value of exhibits by counting the number of visitors who stopped to look at them and recording the length of time each visitor spent. A total of 208 visitors was interviewed to discover what features of the exhibits had attracted them, what they had learned and what exhibits they liked best. Animal husbandry, engineering, entomology and soil conservation were the exhibition subjects most preferred.[129]

J. Garland and others (1948) studied the extension work in Winston county. The data were obtained in personal interview with 204 white families in Winston county, a representative sample of all farm people living in the county. The "White Rat Exhibit" had been carried out in each school of the county and in a public store window in Louisville, Mississippi. The questions under study in this experiment were to find out the knowledge that people had of the program and their attitudes as reflected in the acceptance and use of recommended nutritional habits.

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[129]G. M. Frier and L. M. Busche, Indiana State Fair Exhibits in the Purdue University Building, Extension Studies Ciruclar, 6 (La Fayette: Purdue Agricultural Extension Service, 1941), pp. 8 (processed).

It was found that: (1) one half of women and men had heard of the experiment; (2) thirty percent of the women and twenty-five percent of the men knew why the experiment had been conducted; (3) eighteen percent of the women, nine percent of the men and twenty-five percent of the mothers who had children reported changes in their food habits as a result of the experiment, and (4) the greatest number of changes was reported by persons in the higher educational groups. This experiment shows the need for the placing of greater emphasis on the importance of using effective appeals in the creation of proper desires among people. It also indicates that repetition of efforts and a combination of various methods may be needed to produce desirable changes in people.[130]

Frank Reel Elliott (1936) conducted a field study with Indiana State Fair visitors. Prior to the study, Elliott, in September, 1934, undertook a field survey of the relative attention and memory values of an educational exhibit presented under the following conditions: (1) without any accompanying explanatory advertising; (2) with poster advertising; (3) with radio advertising, and (4) with poster and radio advertising simultaneously. The purpose of the investigation was to determine the relative effectiveness of visual, auditory and visual-auditory communication, or to determine eye versus ear appeal in the advertising of material. It was found that visual-auditory ranked first, auditory second and visual third. Competition between radio and posters tended to confuse

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[130] What Research Shows About Visual Aids, op. cit., p. 43.

the observers. A total of 27,000 visitors to the Indiana State Fair at Indianapolis, represented a fair sampling of the Indiana population. They took the test without knowing it. The problem was to get the attention of visitors coming within attention range of the exhibit, under conditions where there was keen competition for the visitors' attention. On the attention effectiveness of the exhibit the following is the ranking: (1) without advertising; (2) with poster advertising; (3) with radio advertising, and (4) with poster-radio advertising.[131]

J. N. Raudabaugh and D. S. Cooke (1948) studied the effectiveness of the farm and home labor-saving show in the Atlantic, Cass County, Iowa trading area. The show was sponsored by the Iowa Extension Service in thirty counties of the state. It consisted of a caravan of thirteen exhibits, showing and demonstrating ninty-nine different recommended practices; 80,000 persons attended the shows in the State. The study was made in seventy-eight sample areas in the Atlantic trading area of Cass County, Iowa. The four exhibits of most interest to farm operators attending were: weed and pest control; water and sewage disposal; good pasture and pasture improvement, and farm safety. The four exhibits of most interest to homemakers were: arrangement of kitchen, home storage of clothes, kitchen and laundry labor savers and farmstead planning and remodeling. Ninety-four percent of the farm families in the study who attended the show planned to adopt some of the recommended practices, homemakers indi-

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[131] Ibid., p. 42.

cated they intended to adopt an average of six new practices, farm operators indicated an average of four intended adoptions of new practices, eighty percent of the farm families who attended the show adopted an average of three new practices per family, sixty-four percent of the families attending the show requested bulletins and additional information regarding new practices, twenty-three percent of these families who ordered bulletins did it for the first time and ninety-one percent of the farm operators and ninety-six percent of the homemakers evaluated the show as being beneficial and indicated they would attend a similar show if one were planned for the next year.[132]

Mayhew Derryberry (1941) studied the effectiveness of the health exhibits at the New York and San Francisco World's Fairs. Measurement was done by devices designed to answer such questions as: (1) Does this exhibit attract attention? (2) Does it sustain interest? (3) Can it be easily understood? and (4) Does the audience get the message? In order to answer the first two questions, the behaviour of a random sampling of 3,000 visitors to the building was observed. In each case a member of the staff followed an individual through the building and recorded each exhibit to which the visitor stopped, together with the length of time (by stop watch) he remained there. Test questions based on the contents of the several exhibits were used to answer the third and fourth questions.

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[132] Ibid., pp. 37-38.

These latter measured whether the public understood the message and whether it learned the message. It was observed that panels of statistical data, graphs, and tables usually fail to attract attention or to get over the message. Twenty-six major health exhibits were studied. The Pneumonia Exhibit was displayed on two walls set at right angles to each other. Out of 950,000 persons who viewed any of the Pneumonia Exhibit, nine out of ten spent some time examining the panel describing the disease, whereas scarcely two out of ten spent any measurable amount of time examining the statistical table. The conclusion here is obvious, namely, any message that might have been conveyed by the statistical panel was totally missed by four-fifth of its possible audience. The same lack of interest in the statistical panel was noted in the Maze of Superstitions and in the exhibit portraying phases of the growth and distribution of the population of the United States. Not only did the statistical panels fail to arouse interest, but they were frequently misunderstood. It was also found that even common professional words like "therapeutic", "placenta" and "nephritis", were misleading to the public. Two other conclusions arrived at were: (1) even expertly designed exhibits may impart misinformation, and (2) tests would serve as a good educational technique.[133]

Summary of exhibits principles of use. In brief summary, the major principles found to govern the influence of exhibits in this review will be listed below.

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[133]Mayhew Derryberry, "Exhibits," The American Journal of Public Health, XXXI (March, 1941), pp. 257-263.

(1) Exhibits attract attention.

(2) They are helpful in creating interest in solutions to farm and home problems and help farm people to make changes.

(3) They can be one of the principal channels through which the extension worker can reach and inform large numbers of people, including nonfarm people.

(4) People prefer simple exhibits so they can comprehend them at a glance.

(5) The language of description of the exhibits should be kept simple.

(6) Exhibits are more effective when reinforced with other media.

(7) Visitors at fairs spend little time looking at exhibits. Therefore it is necessary to use methods for attracting attention, arousing interest and stimulating desire.

(8) People like best the familiar and commonplace.

(9) Exhibits can bring about improvements in habits of living including nutrition.

IV. PICTORICAL ILLUSTRATIONS

The discussion in this part will be limited to flat, still pictures such as photographs, text book illustrations, prints, cut-outs, postcards, magazine and newspaper clippings.

There is a dearth of research on the effectiveness of pictorical illustration or "flat" pictures, most emphasis having been placed on the preferences of children for pictures of different kinds. However, adequate

review of research had been prepared by Dale and others (1949-1950), Ibison (1954), Spaulding (1955) and the Illinois Extension Division of Communication.[134]

One of the early studies was that of Florence Bamberger (1950) which concluded that children like books with brilliant colors and illustrations with little detail and plenty of action. Bamberger indicated that illustrations should cover at least half of the total space of a children's book.[135]

In another choice-type research project, William A. Miller in 1936, found that fifty-five percent of 300 children tested chose illustrations in full color in preference to one-color or black-white illustrations. Red was preferred to blue, although the older children expressed less preference for specific colors and a more pronounced preference for fully-colored illustrations as compared with black and white or partially colored illustrations.[136]

Rodriguez Bou (1950) reported a study which, on the basis of a choice type test procedure, concluded that Puerto Rican children of the second, fourth and sixth grades preferred realistic illustrations to line drawing.[137]

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[134]William H. Allen, op. cit., p. 121.

[135]Seth Spaulding, "Research on Pictorical Illustration," Audio-Visual Communication Review, III (Winter, 1955), p. 36.

[136]William A. Miller, "What Children See in Pictures," The Elementary School Journal, XXXIX (December, 1938), pp. 280-288.

[137]Rodriguez Bou Ismael, Estudio Sobre Preferencias Chromaticas Y de Illustraciones (Rio Piedras, Puerto Rico: Superior Educational Council, 1950), pp. 78-84.

A study by Mabel Redisill (1952) of Duke University attempted to interrelate some of the established findings regarding children's preferences to illustrations. Results of Rudisill's study indicated that realistically colored illustrations are preferred over unrealistically colored ones. If the colors are constant, the realistic style is preferred. A conclusion peculiar to this study is the very significant indication that, if the subject matter is the same, children prefer an uncolored illustration which gives them an impression of reality to a colored one that does not conform to reality. If there is difference in amount of color, children prefer the one with less color if it conforms more to reality.[138]

A study by Marie G. Halbert (1944) considered the effect of illustrations on the interest and comprehension demonstrated by children utilizing reading texts. Halbert concluded that children "get more relevant ideas from reading a story with pictures than from reading a story alone or from the pictures alone." A wider variety of ideas is stimulated by the presentation of illustrations alone, but "the majority of the ideas reported from pictures alone were irrelevant to the story or to the ideas intended in the pictures." Halbert continued "from the standpoint of stimulating ideas which are directed toward some specific goals pictures alone are inferior to reading matter with or without pictures." To the extent that memory of ideas is a measure of comprehension, it was concluded that pictures contribute to the comprehension of reading materials.[139]

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[138]Mabel Rudisill, "Children's Preferences for Color Versus Other Qualities in Illustrations," The Elementary School Journal, LII (April, 1952), pp. 444-451.

[139]Spaulding, op. cit., p. 36.

Other studies with children include those of Williams (1924), Vandermark (1929), Waymac-Henderson (1932), Freeman-Freeman (1933) and Morrison (1935). According to a summary by Rodriguez Bou these studies agree on the point that colored illustrations are preferred by children and that older children prefer softer tones and lines than younger ones who prefer brilliant colors. Several studies indicate that children prefer illustrations that contain action and that tell a story related to previous experiences and that can be associated with places, objects, persons or animals about which they have read or are familiar. As for technical elements, realistic drawings are preferred, while silhouettes and stylized drawings are unpopular. The sex, intelligence and cultural level of students have been found to affect to a degree the preference for color and type of illustrations.[140]

Adult preferences. Very little research has been done to determine the effectiveness of various types of illustrations for adult audiences. However, a study by Malcolm S. Maclean, Jr., and William R. Hazard (1953) suggests a number of factors underlying interest in news pictures. These factors may be similar to those which determine interest in illustrations. The authors concluded that six major appeals, including Idolatry, Social problems, Picturesqueness, War, Blood and Violence and Spectator Sports, proved to account for nearly all measured variation in interest for thirty-one out of fifty-one pictures selected from Time and U. S. News and World

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[140]Malcolm S. Maclean Jr. and William R. Hazard, "A Women's Interest in News Pictures: The Badger Village Study," Journalism Quarterly, XXX (Spring, 1953), pp. 139-162.

Report for 1949 and 1950. According to the data quoted in the study, women expressed less interest than men in machinery, gory pictures and sports. There was tendency for the respondents to lack interest in the pictures when (1) the picture treated with a subject about which the respondent knew nothing or in which he was not interested and (2) the picture was vague as to content or action.[141]

A more general study of newspaper photographs was that published in 1947 by Bert W. Woodburn. Woodburn summarized data as to photograph readership as revealed in the first 100 issues of The Continuing Study of Newspaper Reading. Woodburn suggests that it is to be noted that "when the picture area is increased four times (one column up to two columns) reader interest on the average increases only one third. If maximum effectiveness is desired, regardless of space used, the larger photographs will attract up to forty-two percent more attention". The author also concluded that "newspaper readers seem to read what interests them and what touches upon their daily lives." As regards to categories of interest, Woodburn mentions that people like pictures that relate to their daily living and to daily events that are personally significant. Color and overline (Headlines) according to Woodburn, increase photograph readership. Picture pages attract interest and are read by more people than any other pages in the paper.[142]

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[141] Ibid.

[142] Spaulding, op. cit., pp. 40-41.

From a careful review of the research and an experiment with newly literate adults in Latin America, Spaulding (1950) concluded that an illustration should be presented in terms of the past experience of the intended audience: it should be kept simple; it should be in color; and captions should be used to generalize, modify, relate and extend the meaning of the illustration.[143]

Eye-movement tendency. In their studies of eye-movement tendencies of individuals who looked at pictures, Buswell (1935) concluded that the directions given prior to looking at a picture had a marked effect upon what was seen in the picture.[144] Herman F. Brandt (1945) found that initial fixations of the eyes tended to fall to the left and above the center of the picture, indicating that content of an illustration should be organized so as not to oppose eye-movement tendencies, but rather to place the most significant portions of an illustration in the center or upper left of the picture.[145]

Previous experience and illustration effectiveness. A 1952 study by John E. French shows that younger children consistently prefer simple drawings, while older children and teachers preferred the more complex. Ross L. Mooney (1951) on the basis of his experiments in the perception laboratory at The Ohio State University, found that a person, without consider-

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[143]William H. Allen, loc. cit.

[144]Guy T. Buswell, How People Look At Pictures (Chicago: University of Chicago Press, 1935), 198 pp.

[145]William H. Allen, loc. cit.

able experience in interpreting illustrative materials may have difficulty in doing so when the necessity arises. Study of the illustration is an abstract experience, and meaning exists only to the extent to which the observer has experience with which to interpret the drawing and to relate the lines on the paper to the actual experience which it represents.[146]

George H. Gallup (1947) in his studies of the attention value, of pictures came to the following conclusions: (1) people will not take time or trouble to figure out a picture; therefore, a picture should be taken in all at one glance; (2) modern art, symbolism, or sketches are not as easily understood as actual pictures; (3) photographs, or art that is photographic in detail, will stop twice as many people as an advertisement without photographs or such art; (4) pictures relevant to the story are more effective than those which are not; (5) photographs that picture people in a situation, especially in action, are better than people depicted "alone" or "still"; (6) real or actual backgrounds add materially to interest; (7) pictures that show people expressing some observable emotion, such as woman waving and smiling, are to be preferred to "dead pan" pictures, and (8) reader identification is important. If one desires to stop the maxium number of women of thirty-five years of age, one should use pictures of women of about that same age.[147]

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[146]Ross L. Mooney, Perception, Language, and the Part-Whole Problem (Columbus, Ohio: Bureau of Educational Research, The Ohio State University, 1951), p. 1-21.

[147]What Research Shows About Visual Aids, op. cit., p. 44-45.

A summary of principles of use of pictorial illustrations. The following is a summary of the principles listed above which have been found to govern the influence of pictorial illustration on readers.

(1) Illustrations are an effective interest-getting device.

(2) Illustrations may help the reader interpret and remember the content of the accompanying text-material.

(3) Realistic, colored illustrations are more effective than black and white, but the amount of added effectiveness may not always be significant.

(4) There is some question, as to the effectiveness of the addition of one color to back and white illustrations. Color, in the latter instance, may violate the realistic qualities of the illustration and may result in an end product that is not as effective as black-white illustration.

(5) The larger the illustration, the more probable that it will attract attention. However, attention-getting qualities do not increase in mathematical proportion with the size.

(6) Headlines or captions may help attract attention, but only if they are simple, complete and add something descriptive.

(7) The content of the illustration must be related to the life and interest of the reader to be effective.

(8) Illustrations are a degree of abstraction. They are interpreted according to past experience.

(9) Illustrations preferred by children are not always those that are most attractive to the teacher.

(10) Illustrations help develop attitudes, attract attention and motivate people to action.

(11) People will not take time to figure out a picture; therefore, a picture should be such that it can be taken at a glance.

(12) Action pictures are better than static pictures.

(13) Pictures that show people expressing some observable emotion are more effective than those that do not.

(14) People identify themselves with the subject of a picture.

V. GRAPHIC MATERIALS

Graphic materials, for the purposes of this study, will include graphs, cartoons, comics and posters.

Graphs. J. N. Washburne (1927) studied the effectiveness of graphic presentation in terms of: (1) the arrangement data; (2) the number of items presented; (3) the quantity versus the arrangement of data as factors in the recall of information, and (4) the impact of visual differences as compared with differences in logical arrangement. In concluding, Washburne pointed out that: (1) simple visual patterns with few data tend to produce more specific recall, more general recall resulting from a presentation of more data in more complex visual pattern; (2) bar graphs are best for complex or slightly complex static comparisons; (3) pictographs are best for simple comparisons; (4) line graphs are best for dynamic comparisons; (5) statistical tables are best for specific comparisons; and (6) round numbers, and not too many of them, are best for conveying specific amounts.[148]

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[148] J. N. Washburne, "An Experimental Study of Various Graphs, Tabular and Textual Methods of Presenting Quantitative Materials," The Journal of Educational Psychology, XVIII (1927), pp. 361-376, 465-476.

Lewis Peterson and Wilbur Schramm (1954) tested the relative accuracy with which five parts of a whole can be read from eight different graphic forms: the circle; disc; single bar; multiple bar; multiple cylinder, multiple square colum; multiple area column, and the cosmograph. The specific findings of this study were: (1) the circle graph is read most accurately when used to compare the parts of a whole, while the multiple area column graph is read least accurately; (2) the single bar graph is read more accurately than the other forms that fall between the circle and the multiple area column graphs; (3) in reading parts of a whole, the largest part tends to be underestimated, while the middle-sized parts tend to be overestimated, and (4) the square column graph and the cosmograph tend to be read with more consistent accuracy throughout all of their portions than other graphic forms.

Peterson and Schram (1954) observed that accuracy in reading graphs was directly related to age, education and training or experience in the use of graphs. They also observed that there was relatively less reading accuracy when the graphic presentations contained: (1) more dimensions; (2) more parts, and (3) a wider range of quantities to be presented.[149]

F. E. Croxton and R. E. Stryker (1927) studied the relative accuracy of readings from bar and circle graphs using combinations of percentage. The results of the study indicated that: (1) the circle was best for 50-50

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[149]Lewis Peterson and Wilbur Schramm, "How Accurately Are Different kinds of Graphs Read"? Audio-Visual Communication Review, II (Summer, 1954), pp. 178-189.

comparisons, but bars were best for two-part comparisons of odd amounts; (2) the circle graph was best for three-and four-part comparisons, and (3) a greater number of divisions within a single graphic form tended to increase the errors the reader was apt to make.[150]

A study by W. C. Eels (1926) supports the case for circle graphs as the best method of presenting the component parts of a whole. According to Eel's findings: (1) circle graphs can be read as quickly and as easily as bar graphs; (2) circle graphs can be read more accurately than bar graphs, and the accuracy of judgement increases with the number of sub-divisions in the circles, but correspondingly decreases in bars, and (3) circles are judged by various methods--angles, arcs, chords and areas--but accuracy is not affected.[151]

J. W. Wrightstone (1936) compared the relative value of conventional graphs and pictorial statistics in aiding the reader: (1) to locate specific information accurately; (2) to interpret and pull together the facts presented, and (3) to recall the information immediately and after a period of time. On the basis of the test results, Wrightstone concluded: (1) pictorical statistics were more effective in helping students to locate specific information and to recall it one day later; (2) differences in interpretation and in immediate recall were not significant, and (3) the

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[150] F. E. Croxton and R. E. Stryker, "Bar Charts Versus Circle Diagram," Journal of the American Statistical Association, XXII (1927), pp. 473-482.

[151] W. C. Eels, "The Relative Merits of Circles and Bars for Representing Component Parts," Journal of the American Statistical Association, XXI (1926), pp. 119-132.

students expressed a decided preference for pictorial statistics.[152]

In a review of research on graphic presentation, the National Project in Agricultural Communications at Michigan State University concluded that: (1) simple visual patterns with scant data tend to produce more specific recall; (2) accuracy in reading graphs is related to age, education and training or experience in using them; (3) accuracy of estimates drops when the number of dimensions of the graph increases; (4) accuracy of estimates drops when the number of elements included in a single presentation increases, and (5) a circle graph is probably the best way to illustrate parts of the whole.[153]

Cartoons. Laurence W. Schaffer (1930) studied, children's interpretations of social and political cartoons. He found that, on the average, children begin to interpret such cartoons abstractly at about age thirteen. The range of greatest increase in percentage of abstract response to symbolic drawings occurs between grades six and eight. An analysis of erroneous interpretations, furthermore, showed that the absence of meaning of word elements in cartoon captions (in other words, lack of a background adequate to give correct meaning to the words used) was a particular cause of error. He also reported effective results from the use of cartoons to illustrate scientific concepts in teaching science.[154]

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[152]J. W. Wrightstone, "Conventional Versus Pictorial Graphs," Progressive Education, XIII (1936), pp. 460-462.

[153]National Project in Agricultural Communications, "Say it With Pictures," Agri. Search, I (November, 1955), p. 4.

[154]Laurence W. Schaffer, Children's Interpretation of Cartoons (New York: Bureau of Publications, Teachers College, Columbia University, 1930), pp. 51-52, 66.

Comics. Robert L. Thorndike (1941) analysed the language of the comics. His study indicated several points of interest. The most significant of these is the finding that a child who reads one comic book per month will read approximately twice as many words per year as his reading text books contain. Thorndike concluded that both the amount and the character of the vocabulary provided valuable practice in reading for the young reader.[155]

Sones (1944) investigated the unique contribution of the comics as compared with that of the printed text. In summary Sones say, "In other words the picture groups seemed to have learned almost as much as they were capable of learning from their first reading while the groups reading the printed texts first had not reached saturation point, but did so by a second reading in the picture form."[156]

Estimates in 1953 placed the number of readers of comics in the United States at well over 100,000,000. Between 400 and 500 comic book titles are on sale, and some 95,000,000 copies are sold each month. Translated into more than thirty languages, they are widely read in more than 100 countries. This figure will tend to show that this medium ofe communication has become firmly established in our society.[157]

Posters. The four basic findings made by the United States Office of Facts and Figures Graphics Division were: (1) war posters that make

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[155]Robert L. Thorndike, "Words and the Comics," The Journal of Experimental Education, (December, 1941), pp. 110-113.

[156]Walter Arno Wittich and Charles F. Schuller, Audio-Visual Materials Their Nature and Use (New York: Harper and Brothers, Publishers, 1953), p. 143.

[157]Ibid., p. 139.

purely emotional appeal in picture and text are by far the best, (it was found that such war posters definitely attracted the most attention and made the most favourable impression upon men and women alike, no matter how beautiful the art work, how striking the colors, or how clever the idea); (2) war posters that are symbolic do not attract a great deal of attention, and they fail to arouse enthusiasm (it was found that symbolism is often misunderstood); (3) war posters that make straightforward, factual appeals are much less likely to be effective than those that make emotional appeals, and (4) unlike humorous commercial posters, humorous war posters do not attract so much attention, nor do they make so popular an appeal as emotional or even factual war posters. Moreover, some people definitely were found to dislike humorous war posters.[158]

Graphics in general. Since the early studies on the most effective forms of graphic presentation, comparatively little research has been reported with the exception of Malter's (1947-1948) studies on the ability of children to read graphic materials. Vernon (1953) summarized a series of studies and articles in England on graphic presentation with the general conclusions that: (1) readers require special training to enable them to understand graphic materials, properly; (2) placing information in diagrams does not necessarily insure that the material will be understood and remembered better than when it is presented in a table or figures; (3) certain types of data require certain types of diagrams, and (4) people usually understand diagrams better when they are accompanied by verbal explanations.[159]

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[158] What Research Shows About Visual Aids, op. cit., p. 49.

[159] William H. Allen, loc. cit.

A summary of principles of use of graphic materials. The following principles govern the influence of Graphic Materials.

(1) Accuracy in reading graphs is related to age, education and training or experience in the use of graphs.

(2) Simple visual patterns with few data tend to produce more specific recall.

(3) A circle graph is a superior way of illustrating parts of a whole.

(4) In estimating parts of a whole, the largest part tends to be under-estimated while the middle-sized parts tend to be over-estimated.

(5) Accuracy of estimates drops when the number of dimensions of the graph increases.

(6) Accuracy of estimates drops when the number of elements included in a single presentation increases (excepting in the case of the circle graph where the reverse is true).

(7) Of the two types of graphs, pictorial and conventional, the pictorial graph is more easily understood.

(8) To be easily comprehended, graphs must not be made too complex.

(9) Readers require special training to enable them to understand graphic materials properly.

(10) People usually understand diagrams better when they are accompanied by verbal explanations.

(11) Certain types of data require certain types of diagrams.

(12) Placing information in diagrams does not necessarily insure that the material will be understood and remembered better than when it is presented in a table of figures.

(13) Posters must be designed so as to be understood instantly.

(14) Posters with an emotional appeal are more effective than others.

(15) A poster that shows a realistic picture will be better understood than one showing a symbolic picture.

(16) Humorous cartoons can be used only when they will not offend.

VI. SOME GENERALIZATIONS ABOUT THE USE OF VISUAL AIDS

Proper selection of visuals requires recognition of the fact that there is no one best tool in the visual aids kit. In fact, there is no one best tool of any kind in communication. Each has appropriate applications and each has conditions under which it should not be used. The responsibility of the person who uses visual aids is to get to know the characteristics of the various media and select the best combinations of media for particular situations. There is no one best solution for all situations. We should not try to evaluate the costs and effort necessary for good teaching in monetary terms but in the results it produces. In closing this chapter, some generalizations about the use of visual aids will be given below.

1. Visual aids should be viewed as being merely an aid in the teaching process. They do not teach in and of themselves.

2. Almost anything that has been said about the general teaching process should be seen to apply to the use of visual aids. Among such observations the following might be included:

(a) A visual aid is most effective if it presents one central idea

(b) The more often a visual aid is used and the greater the number of exposures, the greater the number of people that will be reached.

(c) The greater the number of visual aids used (within limits of expense), the greater the likelihood of learning.

3. The more that visual aids are integrated with oral teaching, the more likely they are to be effective.[160]

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[160]What Research Shows About Visual Aids, op. cit., p. 53.

CHAPTER V

ADMINISTRATION OF VISUAL PROGRAMS

Today's educator still has only three basic ways to communicate ideas and information. He can write, he can speak and he can use visual aids. Through the years, the techniques of writing and speaking have been highly developed and extensively used. Until recently, however, little had been done to develop the science of visual communication.

Studies in the field of communications and dramatic teaching experiences during the war years demonstrate the effectiveness and value of visual aids in education. At the same time, surveys indicate that the visual and auditory education idea has been accepted in American education with unprecedented speed within a very short period of time. Evidences of this are available in many forms which include, but are not limited to, the following:

1. A rapidly developing body of research findings which establish with validity and reliability, that the well-planned use of carefully selected visual materials can improve the rate and quality of class room instruction.
2. The appearance of visual and auditory courses in over 500 of the major American universities and state and private colleges. Basic courses have such titles as Methods in Audio-Visual Instruction, Improvement of Instruction Through Audio-Visual Means and Curriculum Enrichment Through Audio-Visual Methods.

3. The rapid growth of the Department of Audio-Visual Instruction of the National Education Association since its establishment in 1946. Both the membership and the budget increased rapidly, the latter 300 percent by 1956.

4. The steady increase in the number of new staff positions in state departments of public instruction, public schools, colleges and universities, entitled director, supervisor, or coordinator of audio-visual instruction or education. In 1955, 993 school districts which responded in a national survey of audio-visual practices reported 346 formally budgeted and staffed departments of audio-visual instruction.[1]

Any area of American educational practice that enjoys such rapid growth and importance merits serious consideration in the planning that is done continuously. For this reason, the following pages are devoted to a discussion of the administration of visual programs.

I. STUDIES MADE IN THE UNITED STATES AND CURRENT TRENDS

A review of the research relating to visual and auditory administration and supervision was made by Allen and by Allen and Malter as reported in the 1954 Year Book of the Department of Audio Visual Instruction of the National Education Association. Consideration of four studies spaced over a period of thirty years trace the growth and development of

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[1]Walter A. Wittich and Charles F. Schuller, The Audio-Visual Materials Their Nature and Use (New York: Harper and Brothers, Publishers, 1957), pp. 508-509.

visual and auditory instructions in the United States. The first study, McCluskey's unpublished National Survey (1923) serves as a baseline from which the growth of audio-visual instruction can be measured. The second study of Koon and Noble's questionnaire survey of 8806 school systems, made for the American council on Education in 1936, revealed the difficulties hindering research progress in audio-visual instruction and on the needs for such services. The third study was undertaken by the National Education Association's Research Division in 1946. It was based upon replies from over 1000 city superintendents and revealed no clear-cut administration plan throughout the country, but rather a variation of policies and practices. Of particular interest were statements of Superintendent's regarding the major barriers which kept their own audio-visual programs from developing. Prominent organizational barriers identified were "lack of a specially trained Director", and "lack of a central audio-visual agency". Administrators rated very low the barriers of "indifference" or of "opposition by the board of education or the administration". The fourth status survey of the audio-visuals in the city school systems was made again by the National Education Association's Research Division (1955) for the school year of 1953-1954. Since that survey, the number of formal, audio-visual departments has increased from sixteen percent of the reporting cities to twenty-seven percent, and about one-half the reporting cities (1960) signified their satifaction with the administrative organization. The 1955 study also indicated that: (1) two thirds of the districts had audio-visual centers, but only one-fourth had central audio-visual departments; (2) audio-visual equip-

ment per 10,000 students had more than tripled; (3) materials such as films and filmstrips had more than tripled, and (4) audio-visual building coordinators, were appointed in about three-fourths of the schools, but one-third of them were given no free time during school hours for the responsibility and over one-half were given less than half time.[2]

Between the years of 1914 and 1920 six university extension divisions created audio-visual departments. During 1920 to 1930, five more such departments were established. Slow but continuous growth took place thereafter until just prior to American entry into World War II in 1941. In the short period from 1941 until 1950, the number of audio-visual departments doubled. From 1951 to the time of this study, only four new departments have been formed. Those extension divisions which had well-organized programs would naturally be members of the National University Extension Association. In 1947, there were sixty-five active member divisions. Ten years later were seventy-six active members.[3]

The need for specially-trained, centralized audio-visual leadership in a recognized administrative department was stressed in studies conducted at Connecticut (1951), Oregon (1952) and Michigan (1951). This same factor was emphasised in the Seaton study (1944), a recommendation being made in that work for employment of a full-time, audio-visual specialist in cities or counties of 25,000 or more population. Brumbaugh (1952), studying certain aspects of selected 16 mm film-lending libraries

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[2]William H. Allen, "Audio-Visual Communication," Encyclopedia of Educational Research, 3rd edition (New York: The Macmillan Co., 1960), pp. 128-129.

[3]Robert E. De Kieffer, "Audio-visual activities of Extension Divisions in Teacher Education," Audio-Visual Communication Review, VII (Winter, 1959), pp. 38-40.

in eighty-three colleges and universities, concluded that the most important growth factor was that of the personal leadership characteristics of the personnel. A need for state leadership also was shown in studies by Wait (1953). Other studies by De Kieffer (1948) and Taylor (1951) show the need for state leadership. Meierhenry (1952), in a questionnaire survey of state audio-visual directors, found uniformity of opinion on the characteristics of an optimal, state audio-visual program.[4]

The type and number of personnel in any organization usually indicates the magnitude of its operation. The total number of full time persons employed in extension divisions has increased from 228 in 1947 to 484.5 in 1957, and part-time personnel from 268 to 586.[5]

A 1946 survey of over 1000 school districts found that the 1945-1946 median expenditure on audio-visual education for all cities reporting was 35 cents per pupil. This varied from thirty-two cents, in cities over 100,000 population, to $1.68, in cities between 2500 and 5000. A 1955 survey showed that financial support for audio-visual education had about doubled since the earlier (1946) survey. There is a tendency for audio-visual specialists to favour suppor of audio-visual programs a per-teacher rather than on a per-pupil basis,thus assuring a more stable basis of support.[6]

Few studies have been made of the functions of audio-visual supervisory personnel in school systems, the principles and procedures being typically derived from surveys in other fields of supervision. The

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[4]William H. Allen, op. cit., p. 129.

[5]Robert E. de Kieffer, op. cit., p. 40.

[6]William H. Allen, loc. cit.

DeBernardis and Brown study (1946) is one of the objective attempts to obtain information on skills and knowledge needed by teachers using visual and auditory materials. Reed (1950) in a survey found that only one-third of the teachers were ordering three-fourths of the films used and that most teachers ordered few or none at all. However, he found that teachers who used films were making wise use of them. Hoban (1946) reported similar findings from a U. S. Army Pictorial Service Study. When an Army film library had a coordinator who was able to keep officers informed of appropriate films, arrange previews and operate the library efficiently, the use of films increased considerably. Such libraries provided more services for men, more often, and with fewer prints than did libraries without coordinators.[7]

White (1953) studied the problem of teacher competence in the use of visual and auditory materials, and found that teachers who had instructions in the visual and auditory techniques used more materials in their teaching and used them better. Hyer (1952), studying possible deterrents to film use in Rochester, New York, high schools reported that the audio-visual coordinator played an important role in the audio-visual program and that teacher inertia was one of the outstanding deterrents to film use.[8]

One of the primary services which the audio-visual departments of various university extension divisions render is the distribution of materials and in some cases equipment to schools, churches, their own academic

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[7] Ibid.

[8] Ibid., pp. 129-130.

departments and other agencies. While in 1947 ninety-seven percent of the departments distributed materials, by 1957, one hundred percent of the audio-visual departments were engaged in such distribution. While 16 mm sound motion pictures headed the list of materials distributed in 1957, the prerecorded magnetic tapes were second most often mentioned. Thirty-six institutions were distributing 3-1/4" x 4" slides, 35 mm filmstrips and transcriptions. It is interesting to note that 2" x 2" slides were taking precedence over the older 3-1/4" x 4" slides. This again shows that extension divisions are changing the types of materials they distribute in keeping with the latest developments in the field and based on the needs of extension worker for such materials. Other types of materials which were mentioned as being distributed were: books and bulletins; study prints; exhibits; flannel boards; photographs; radio scripts; charts and phonographs.[9]

The university extension divisions have been in a unique situation to assist with the pre-service and in-service education of teachers in audio-visual methods and techniques. With reference to pre-service education, extension divisions have a large amount of visual and auditory materials and equipment and well trained staffs who have a first hand knowledge of how these materials and techniques can be used most effectively in improving instruction. The number of extension divisions offering these services increased from twenty-eight in 1947 to thirty-seven in 1957. It is significant to note that extension divisions have seemingly impressed colleges of education with the importance of audio-visual

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[9]Robert E. de Kieffer, op. cit., pp. 40-41.

preparation for pre-service teachers and pointed out the need for these colleges to provide necessary equipment, facilities and staff for such teaching. In the area of in-service education, university extension divisions are committed to assisting teachers in the field to make the most effective use of audio-visual materials. One of the basic functions of university extension divisions is to serve the people of an area or state as an educative body outside the walls of the land-grant institution. The percentage of extension divisions which offer assistance to in-service teachers remained constant at seventy-two percent from 1947 to 1957, although the total number of divisions offering such services rose from 39 to 41. Among divisions in the remaining twenty-eight percent in 1957 are those which stated that this area of service was completely lacking in their program because of the nature of their organization and administration. Types of in-service activities cluster around five areas, namely: (1) short courses; (2) correspondence courses; (3) off-campus classes; (4) conferences and institutes, and (5) publications.[10]

Certain trends such as those given below are also be apparent from a consideration of the background and development of visual and auditory education.

1. A trend toward decentralization of the centers of distribution of materials.
2. A trend toward the appointment of an audio-visual coordinator for individual institutions.

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[10] Ibid., pp. 41-44.

3. A trend toward increased and improved teacher education in the use of visual and auditory materials.
4. A trend toward the production of materials specifically planned for each area of curriculum.
5. A trend toward increased use in adult education classes.
6. A trend toward the expanded use of all of the various visual and auditory materials.
7. A trend toward the preparation of teachers' manuals to accompany each aid.
8. A trend toward the production of lighter equipment.
9. A trend toward the incorporation of utilization techniques into the projected and recorded aids.
10. A trend toward new research on how to produce better materials and how to use them more effectively.
11. A trend toward the selection of professional, audio-visual educational personnel who are also qualified either in the field of curriculum, administration and/or supervision.[11]

II. STEPS IN ESTABLISHING AN AGRICULTURAL INFORMATION OFFICE AND SOME GUIDEPOSTS

Obviously the system of transmitting agricultural information that has proved successful in the United States cannot be adopted intact

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[11] Elizabeth G. Noel and Paul J. Leonard, Foundations for Teacher Education in Audio-Visual Instruction (Washington, D. C.: American Council on Education, 1947), pp. 39-40.

in every other country. Modifications must be made on the basis of literacy and the special problems and needs of the audience faced, as well as available resources and facilities. The basic concept remains the same, however; the job of the agricultural information office is to gather accurate and useful information, package it in the proper form and transmit it to the appropriate people so that they will understand. In establishing such an office, six steps listed below might be considered.

1. Determine and appraise the sources of knowledge.

Identify all possible sources of accurate, up-to-date agricultural, home economics and related information. Which institutions are doing research? How can the results of such research be made available to the information office?

2. Determine and analyze the audience.

It should be known who the audience will be, what help and information they will need the most, and how they can be reached.

Will the audience include city people as well as farmers and land owners? Do all the people speak a common language or are there several languages or dialects? Are there religious customs and beliefs that must be considered? How many of the farm families can read news stories, magazine articles or publications? What about radio? Do they have radio sets in their homes or in their villages? Can they be reached with motion pictures, slides or posters?

3. Appraise available facilities.

Study should be made of the availability of such facilities as printing radio, making and using movies. If leaflets and other publications are to be prepared, how can they be produced? Are there facilities

for letter-press printing? Mimeographing? Offset reproduction? What kinds of newspapers are there? Does your target audience read them? Would these newspapers carry agricultural news? What kinds of agricultural magazines and trade papers are published? What is their circulation? Who reads them? How many radio stations are there? Does radio reach the audience you want? Would radio stations carry the agricultural programs? Are there facilities for making and using motion pictures? Posters? Exhibits?

4. Decide which services are best for the situation.

As far as writing and editing are concerned, publications may range from single leaflets and bulletins to detailed reference materials. Releases for newspapers and magazines or circular letters and other direct mail materials may be needed.

Photographic services might start with providing simple black and white pictures to post on bulletin boards and proceed to use of colored films for exhibits. These could also be used as teaching aids for extension workers and as illustrations for bulletins and leaflets or for newspapers and magazine features. Motion pictures and slide sets could be produced for extension meetings.

With regard to art and exhibits, illustrations might be prepared for publications and for flannelgraphs, posters and other teaching aids. Displays and exhibits could be designed and produced.

Local extension workers should be trained to reach people effectively through tours, demonstrations, meetings, exhibits and posters, as well as through mass media. This should be viewed as one of the most important jobs of the information office. The only way of reaching people in some areas may be through the local extension worker.

5. Develop an information staff.

The size of the information staff will, of course, depend upon the kinds and numbers of services required and the funds available. At first, the staff might consist of only one person to do the various tasks such as editing publications, writing news stories, taking pictures and preparing exhibits. As the demand for services increases, other staff members could be added, including specialists in news writing, photography, radio and other communications media. If it is not possible to build an adequate staff at once, specialized help may be obtained from existing government department or agencies.

Information workers should be well qualified. The information specialist serves in a lisison role between the scientist, the county extension worker and the public. He must strive to win the confidence of all three through accurate, careful and perceptive writing and editing. Research workers and extension specialists welcome competent information specialists as team members for improving agriculture and the conditions of rural people.

Ideally, a member of the agricultural information staff should have the following qualifications:

He should <u>have an understanding of farm people</u> and be able to "speak their language." Preferably he should have been born and reared on a farm, or have lived on one for some time.

He should <u>know the science of agriculture</u>. He should be a graduate of an agricultural college or have had agricultural courses in college. This will help him to understand the new knowledge being developed by agricultural scientists. In addition to speaking the language of the

farmer, he should understand the "language of the scientist."

He should know communication techniques. An information worker who writes farm news stories must write the kinds of stories that newspaper editors want. A publications editor must know how to organize materials and write in clear, simple language. He must also be familiar with printing and with layout and design. A visual aids specialist should be skilled in one or more of the areas of photograph, art and exhibits.

The information worker should also be able to teach others to use his methods.

Qualified people must be found for the job. Agricultural college students often show aptitude for journalism or an interest in photography or visual aids. These young people might be considered for positions as beginners. Or capable newspaper reporters, artists or photographers might be found whose background and training would qualify them as potential agricultural information specialists.

Some countries have started courses in information methods for prospective extension workers. Students who do well in such courses often develop into able information specialists.

6. Obtain needed equipment.

An agricultural information office must have certain equipment and materials to function effectively. For example, one type of camera might be needed for black and white pictures--another for color slides--a third for motion pictures.

Other photographic equipment may be necessary, such as a tripod, light meter, special lenses, carrying cases, projectors and dark room equipment.

For writing and editing services such equipment as typewriters, a mimeograph machine, and possibly an offset duplicator will be needed.

Equipment for exhibit production might range from a few simple hand tools to a completely equipped shop.[12]

In 1954, agricultural administrators and editors of U.S. land-grant colleges and universities attended a conference on agricultural communications. The purpose of this conference was to reappraise the role of agricultural information work as part of agricultural education in the United States. The following are some of the guideposts that were listed.

1. The agricultural information office should be responsible to the agricultural administration and should be housed with this administration.
2. All agricultural information workers should be responsible to the head of the agricultural information office.
3. Agricultural information should be corrdinated with other institutional or agency facilities, but should not be under the control of non-agricultural officials.
4. The head of the agricultural information office should participate in the administration's development of programs and policies.
5. Agricultural information staffs should be composed of specialists, each assigned to do a particular type of job.

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[12]Bryant Kearl and Hadley Read, Agricultural Communications Services, Number 1 in a series (East Lansing: The National Project in Agricultural communications , 1960), pp. 14-22.

6. There is need for evaluation and research into the effectiveness of all methods of communication to determine the best combinations to use.
7. Communication training involves two areas: training of professional communication workers, and training of those who use communication skills as a tool in research and extension work.[13]

It goes almost without saying that the program of a visual-aids service, soundly conceived and organized must be efficiently executed.

To be of maximum value, the services provided by the information department must aid personnel at all levels of extension work. A listing of the needs of personnel in the main categories of extension work is given below.

1. County workers need assistance and training in the production and utilization of visual materials and equipment to bring information to farm and city people.
2. Extension specialists need assistance and training in the utilization of visual aids in programs of county workers, as well as in those directly reaching farm and city people.
3. Extension administration needs visual aids to help train its staff, to broaden the scope of extension programs and to increase staff efficiency, as well as to help explain and promote the overall extension program and its objectives.

To be most effective, the visual-aids service must constantly demonstrate the place and value of visual aids. At the same time, the

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[13] Ibid., p. 24.

visual aids staff must keep informed on the needs and problems of extension workers. The extension director may wish to consider the appointment of a consulting committee of the information head, the visual aids specialist, a supervisor and representatives from agriculture, home-economics and 4-H. The primary functions of this committee would be to:

1. Advise the Director on all matters of policy relating to the visual aids program.
2. Maintain a proper balance of visual aids service for the entire extension staff.
3. Determine where additional resources should be placed to meet special situations and programs that need particular emphasis.

Increased emphasis must be placed also on the advantages of advance planning of extension programs at the state and county levels and of advance consideration of the visual aids and other information tools that can assist in accomplishing the objectives of the programs. A well-considered, flexible plan of work should include visual aids properly integrated with other media.

While the first responsibility of the visual aids service is to the extension staff, consideration must be given to making the materials of the service available to other departments of the college and to other colleges of the university. Close contacts and associations also must be maintained with all branches of the Department of Agriculture and with other State agricultural extension services to insure efficient utilization of all new visual developments.

A system should be developed within each State to encourage and facilitate the exchange among extension workers, state and country, of

information on both the kind and variety of visual aids being utilized in their programs and on the results of their use. This serves to report on the extent and effectiveness of visual methods used by the extension staff and to extension administration.[14]

III. MAKING OPTIMUM USE OF EXISTING MATERIALS OR RESOURCES

Individuals who must develop a program in the use of visual communication can rely on two key points useful as guideposts to progress. First, many effective visual materials do not always require a large budget and often can be constructed or improvised from materials already available. Second, the artistic skill or talent of the person who plans to use visuals is much less important than his common sense, alertness to new possibilities and sincere interest in helping others learn.[14]

Few County extension offices or other field offices are so remote as to have no available resources for preparation of simple visuals. Few offices could exist without a visual program of one kind or another. The question then lies in the degree of organization and in the degree of planned, intensive and successful use of materials already available. Therefore, even an office with already established plans, containing excellent equipment and staff, might wish to reexamine its efforts for possible changes. One method of going about this would be to first analyze the needs. Included would be a survey of the subject-

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[14] Nell B. Leonard (ed.), "Planning and Organizing a State Visual Program and Office," Report of the National Visual Aids Workshop at Cornell University (Ithaca, New York: Cornell University, 1949), pp. 7-9.

[15] Hal. R. Taylor, "Administration: Visual Communication Programs," Research, Principles and Practices in Visual Communication (East Lansing: National Project in Agricultural Communications, 1960), p. 139.

matter program area to determine what equipment and materials are already on hand, the extent of their use and the possible restrictions on their use. Once known, services may be improved through an organized, systematic plan for operating -- as formal or as informal as needs may suggest.

To make provisions for services presupposes that the functions of the program call for such services. Whether such needs are immediately evident or not, there should be a continuous study of the program to keep personnel informed and up-to-date on program policies and changes and any technical and specialized assistance available from others. If possible, the study should include a plan of detailed action research about short-term and long-term needs, based on the original survey of visual equipment and materials. Thus, it becomes possible to balance materials in terms of adequate coverage of the subject-matter program and in terms of the different types of visual materials on hand. It also is possible to plan a budget and time schedule for obtaining new materials that are unavailable from resources within or outside the organization. Most important, an organized study can include provisions for production of effective, yet inexpensive materials.

Problems of budget, of course, may create from the outset a serious limitation on how broad a visual program shall be. If plans include obtaining various pieces of projection equipment, probably it would be best to gain support from the central administration funds, at least in part. Then, rentals can work as a library with or without a charge for each service or loan. Production services requiring minimum materials and supplies might be chargeable and payable to a revolving fund from which payments for replacements of supplies and materials could be made.

County offices, whether or not they are serviced by a state visual specialist, often cooperate with adjoining offices on loan and exchange of equipment and various specialized services. Even if funds for materials are plentiful, such a practice can help avoid duplication of materials and equipment and create more efficient use of expensive items.

But, regardless of the size, budget, or staff of a visual program operation, whether that of a centralized state office or of a county office, the major purpose should be that of improving instruction. Each office can improve its instruction and self-services, by means of the below mentioned five ways.

1. Collect and distribute information to staff members about the availability and use of visual materials.
2. Stimulate and sponsor production of home-made visual materials.
3. Develop a collection of teaching materials for distribution to staff members and cooperating individuals or groups.
4. Encourage practical research on the use of visual communication techniques for the improvement of the instructional program.
5. Design and promote an organization-wide program for the use of visual teaching materials.

The above mentioned five points will offer a substantial beginning point or reorganization point, for any center.[16]

Innumerable authorities have discussed making and using visual materials. Authoratative authors like Dale, Wittich and Schuller, and others list possible sources of materials of special value to county

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[16] Ibid., p. 140.

workers. They include commercial sources, government agencies, industrial concerns, airlines, railroads and steamship lines.

Francis W. Noel, in the 48th Yearbook of the National Society for the Study of Education, presents six suggested functions of a visual unit applicable to extension programs. They have special value for relation to a state-wide organization or large county or field office.

Providing Materials and Professional Services so Instructors (Agents) Can Use Visual Materials Under the Best Possible Conditions.

For example, the best means of darkening rooms or controlling light, ventilating rooms, placing electrical outlets and improving accoustics should be suggested. Guidance and counsel should be given on proper room conditioning when new construction is being planned. Suficient copies of various materials to meet additional requests that arise from use must be obtained. Procurement of enough portable equipment to meet demands must be urged. The equipment must be serviced and standby equipment must be provided for use when other equipment is being repaired. Others must be trained in the operation and care of equipment and in proper handling of materials.

Providing Those Services Which Make it Possible for Instructors to Have Materials and Equipment When They Need Them.

For instance, catalogs, bibliographies and special bulletins giving accurate, up-to-date information on available materials should be issued. A filing system so that materials will be readily accessible should be

worked out. A distribution system to make it easy to obtain materials, should be established, considering convenience to the person who will use them rather than convenience to the supplying sources. The equipment should be kept as close to the point of use as possible -- if necessary, equipment may be assigned to individuals on a long-term basis to avoid costs of maintenance and transportation damages. The equipment should be regularly inspected and serviced-- through a minor maintenance operation, at least, such as oiling and replacing of lamps.

Providing Materials and Services Which Allow Specialists or Agents to Select and Use Materials Which Fit Their Teaching-Learning Situations.

For example, there should be cooperation with supervisors and other workers in selecting materials. Materials should be bought on the basis of program needs. The supervisors, agents and specialists should be assisted in the choice and use of materials. Production should be planned and simple materials should be produced to meet specific needs, but production should be limited to those materials not available from commercial sources.

Providing Facilities and Professional Services Which Assure that Materials Will be Used as an Integral Part of the Total Extension Program.

For example, whenever possible materials should be purchased that meet the needs of all age groups contained in the program. There should be cooperation with other organizations on continuous program revision. Evaluation of materials in terms of program objectives should be done continually, and, if possible, research should be conducted which may contribute to revision. The use of materials at all levels should be supervised, by working directly with co-workers, by working indirectly

through in-service training activities, and by keeping supervisors and administrators informed of progress.

Providing Those Services Which Will Help Instructors Make Full Use of Local Resources Already Available.

Possibilities would be to assist in locating materials, places of local interest, professional designers and other people who can contribute information and experience to particular operations. There should be cooperation with instructors to survey and appraise local resources preliminary to the development of a list of suitable resources.

Providing Those Services That Will Assure Instructor Competency in Use of Visuals as Well as Supervisor-Administrator Competency.

For instance, we should be concerned with a continuous program of in-service growth to help personnel gain knowledge and understanding , skills and abilities essential to effective visual use. Included would be training in the following: the philosophical and psychological factors underlying use of visuals; results of research studies; types of visuals available in specific areas; local and nationally available sources of materials and equipment; values and limitations of visuals, methods of obtaining, storing, filing and maintaining kinds of materials and equipment; principles of good teaching that affect selection and use; processes involved in the production of simpler materials, and the service procedures and policies available within the organization and the responsibilities of others necessary for best services to all.

In other words, the person or persons administering a visual program must provide professional leadership to help create competency in the use of materials. Many states already do this, in part, by preparing teacher's guides and manuals, lists of resources and suggestions for use, by urging appointment of preview and selection committees, by planning and/or conducting meetings and workshops, or through individual conferences.

Such activities soon develop the necessity to provide materials and services which will help administrators interpret the total extension program to professional and lay groups. Noel suggests two ways to help: (1) produce visual materials which help explain the organizations program to its own personnel and to the public, and (2) provide equipment and materials to outside groups when their use is related to the organization's program and might help in the formulation of regulations or interpretations of it.[17]

IV. PRODUCTION

The question of production really hinges on three things -- availability, cost and the learning value of the material to be produced. Each producer will have to consider and weigh these three points before he can decide whether he should produce or buy. There are always times when materials of local interest will have to be produced, since such materials are not available through commercial companies; and there are times when the production process will give the audience an appreciation and understanding of a topic that will never be gained from a commercial

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[17] Ibid., pp. 139-141.

production. The following questions should be asked before production is started on any material:

1. Is the material necessary in the learning situation?
2. Is the material already available in a form that can be used or easily adapted?
3. Will the finished production assist in communicating desired concepts?
4. Will it shorten the learning time?
5. Will the cost in both time and energy be less than the cost of comparable purchased material?[18]

Production Principles. There are six generally accepted principles which should be followed in the production of visual aids. They are listed below.

Principle Number One-Cooperation. In creating visual materials, the technician and the subject matter specialists or the County agents must work hand in hand from the beginning if effective teaching material is to be produced. This will permit attainment of high standards of materials as well as subject matter. The systematic production of teaching material should follow a plan based on fundamental principles rather than on the whims of chance.

Principle Number Two-Flexibility. No two teachers teach the same topic in exactly the same way, nor does a teacher teach a topic twice in the same manner. Visual materials should be so constructed as to permit

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[18] James S. Kinder and F. Dean McClusky, The Audio-Visual Reader (Dubuque, Iowa: William C. Brown Company, 1954), p. 300.

flexibility of use to conform to the varying needs of the audience and teachers. Canned instruction is certain to result in stagnation. Other points concerning flexibility include the following:

1. The motion picture is, in particular, the visual device to which the principle of flexibility needs to be carefully applied. Much film footage has been wasted in the attempt to make teaching films self-sufficient.
2. Slide sets and exhibits with written lectures to accompany them are also open to the criticism of inflexibility
3. County agents or others who use them should be trained to adapt visual materials to a variety of situations.

Principle Number Three-Quality. Only material of the finest quality should be used. Therefore:

1. The subject matter specialists and/or the county agents should insist that a high standard of excellence be maintained.
2. The technical quality must be superior as to clarity, freedom from blemishes and balance.

Principle Number Four-Accuracy. Above all else, visual materials must be accurate and authentic. The facts shown should be authenticated and true. The picture or object must illustrate the particular topic under discussion.

Principle Number Five-Visibility. Attention must be directed to the significant points of interest unobscured by unimportant details. This is particularly applicable in exhibits, displays and tours.

Principle Number Six-Relativity. The relative size of subjects must be made clar. Scenes or models should include elements known to the observer which knowledge enables him to judge the unknown element or elements correctly as to size and position.[19]

Many bureaus, museums and schools produce their own visual materials. Wherever this is done, the principles listed above apply, as well as to commercial producers. Professional production of the highest quality may be rendered by adherence to these principles.

The information offices attached to the extension divisions of the land-grant colleges maintain motion picture machines, slides and opaque projectors, motion and still cameras, public address systems and other equipment needed by the state extension staffs. The Extension Editor is the leader of the Extension Information department, and is assisted by associates and assistant editors, and a staff photographer, to serve all extension staff members and county extension agents in a given state.

The principal line of work of the Editor and his staff is in the field of editing and printing informational and service materials for both the extension service and experiment station, such as: bulletins; publications; circulars; record books; report forms; record cards; visual aids, and similar materials. With the help of the subject-matter specialists, the editorial staff under the direction of the Editor: (1) prepares the weekly agricultural news released by extension, which includes news from the experiment station, the college of agriculture

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[19] F. Dean McClusky, Audio-Visual Teaching Techniques (DUBUQUE, Iowa: William C. Brown Company, 1949), pp. 99-100.

and the USDA; (2) prepares stories for county agent use, and (3) writes special feature stories mailed to daily newspapers and stories for the wire services. The staff cooperates fully with the farm journals and farm page editors and other newsmen who come to the camp for interviews and conferences. It also writes numerous articles for the farm journals. In addition, an Assistant or Associate Editor in charge of News, Features and Publications works with administrators, department heads, specialists and other information office personnel in planning, writing and disseminating special news and feature stories on various phases of extension work, and also carries out information coverage of special extension events and programs.

An assistant or associate Editor --Visual Aids, called the Visual aids Specialist in some states, takes the leadership in providing photographs for news releases, special feature stories, bulletins and publications. This includes taking the original pictures or finding suitable pictures for such uses, maintaining file of photographs and negatives, and determining the best possible use of such photographs. Photography includes also making movies, and preparing color slides whenever these are needed for any extension, experiment station or other college instructional purpose. He also works with the subject matter specialists to prepare suitable slides on subjects determined by the specialists. He plans layouts for all types of art work including charts, posters, covers for publications, and picture layouts in publications for preparation in finished form either by commercial artists or in the visual aids section itself whereever facilities exist. He plans for exhibits for

fairs and special events in cooperation with specialists. Once the exhibit has passed the planning stage, the visual editor attends to matters of production of art work, equipment and other details of actual production. He also produces a limited number of movies and numerous news-type motion pictures for use on TV.[20]

To sum it up, production consists of the making of educational motion pictures for use by the county extension personnel. Slide sets on various subjects relative to agriculture, home economics, and 4-H club work, are also produced in cooperation with specialists of the State staff. Other visuals such as exhibits, magnetic boards and flannel boards are produced for use of the state staff. This material includes various types of art work (eg. charts, graphs and posters) as well as models. Photographs in most states are actually taken by members of the State and County staff.[21]

V. PROBLEMS OF STORING, FILING AND ADAPTING MATERIALS

One of the frustrating tasks of any educational office is that of keeping up with visual materials. Tasks of keeping records, filing poster and chart materials and performing routine tasks of handling should require a minimum of effort and operate in their simplest form. The degree to which such office procedure is organized depends on the particular needs and upon amount of space available, number of people who will use the

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[20] Job Description of the Associate Editor-Visual Aids (Knoxville: Agricultural Extension Service, University of Tennessee, 1960), pp. 1-2. (mimeographed)

[21] Letter to the author from J. Aubrey Smith, In charge Visual Education, College of Agriculture, University of Georgia, Athens, dated June 19, 1961.

materials, whether the office receives or distributes materials in packets and individual preferences or office policies. If an office distributes and loans visual equipment, as in a state visual operation, there should be some method for determining who has what on loan, when it shall be returned, when and who has requested it for loan next and when each item was last serviced. Films and filmstrips must be inspected after each booking, and some definite procedure becomes essential for booking these too.

Simple clerical forms work most satisfactorily. Some state offices keep film and equipment records on cards; others use a large sheet of paper for each item showing a year's record at a glance. Size or form of records would depend upon the number of films to be rented and various types of machines owned and loaned by the office. A constant re-examination of routine operations helps to see which steps might be eliminated or improved.[22]

Storage of materials--flannelboards, chalkboards, charts, posters, exhibit panels and models--obviously requires special treatment if the materials are not to become dog-eared and worn. Some offices keep flannelboard symbols, posters and charts on edge in storage bins seperated by vertical dividers, much like music houses store records. Each bin or section within bins is labeled according to content. Access to materials then becomes much more convenient than if items are stacked on top of each other. Such an arrangement also facilitates storage of unused poster board and similar supplies. It may be possible to store flannelboards,

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[22]Hal R. Taylor, op. cit., p. 141.

chalkboards, exhibit panels and models in similar bins constructed to fit each item. Some offices keep projectors, cameras and other equipment near such storage areas, while others store projection equipment in separate rooms. In either case, the main objective is to have specific place for each item of equipment and to assure that after loan or use, a machine is returned to its assigned storage spot. Such a system is helpful both in large, state offices or in the smallest county office.

Movie films, tapes and kinescopes generally fit most conveniently in storage shelves manufactured for such materials. Films, generally packaged in metal cans, may be filed by subject-matter or alphabetically by title. Again, a checkout form of some nature provides a record of inspection, location and length of loan, among other items.

One of the most convenient methods of storing and filing slides is to keep them in large cabinets holding vertical carriers in which slides may be fitted. Carriers hold from fifty to a hundred slides or more, and a cabinet may contain twenty-five to a hundred carriers, depending upon its size. Carriers may be pulled out from the cabinet for viewing and selecting slides without removal until time of use. Smaller number of slides are more economically stored in homemade cases or manufactured boxes. Many county agents, with small collections, merely use empty cigar boxes in which to store slides with the slides numbered for index reference. Photographic supply houses provide a variety of boxes made to hold from twenty-five to several hundred slides in separate grooves for easy access.

Filmstrips generally are packaged in metal cans. Storage and filing becomes a rather simple matter if one keeps all filmstrips in a central location, clean and free from dust and clutter.

Storage of flat photographs can be troublesome for anyone, especially if the supply includes several different sizes. Large photographs -- larger than 8" x 10" - probably would best be stored on edge the same as charts and posters, particularly if they are mounted on display boards. Those photographs which are 8" x 10" in size fit easily into ordinary metal letter-file cabinets. Smaller prints probably keep more conveniently in envelopes. Generally it works best to store photographs of like subjects in the same envelope.

Filing systems, whether for black and white negatives, colored slides, or acetates for overhead projection, should serve at least two purposes: (1) to hold the negatives or slides themselves together with relevant data regarding subject-matter, and (2) to allow each picture to be found at a moment's notice. Of these, perhaps the second purpose is most important. A contact print for identification of black and white pictures attached to a card and a system whereby cards contain negative numbers, dates of exposure, and information regarding the subjects will permit indefinite expansion of the system. Negative files might take the form of albums, containing transparent or translucent envelopes. Commercial sources have these available for purchase. It is easy to make home-made albums from ordinary letter-size envelopes similar to the negative size. Holes may be punched in envelopes along one side so as to

insert them into a loose-leaf binder. Small strips of film of a length of four to six exposures are easier to handle than individual frames or negatives. Photographers place them in envelopes of suitable size and shape, then number the envelopes consecutively. The negative frames themselves contain the number and a letter suffix to the number of each picture. It may be desirable to prepare separate files or albums to handle several different negative sizes-one for each size of negative. Or, providing that a file or album will hold all sizes satisfactorily, one may wish to continue consecutive numbering, regardless of size.

Many state extension services have standard filing systems which might be duplicated as topic subjects for filing negatives. Another popular system for classifying, indexing and filing agricultural publications is the Agdex system developed by the National Project in Agricultural communications. Subjects are grouped under major headings and separated by topics or phases. It provides subject breakdowns and combinations of various subject areas, although the central core of the system is built around farm products.[23]

Photographs of people might be indexed alphabetically by their names. Sections of a county or state or region also might be arranged alphabetically by name of place. Thus, indexing can be independent of the storage system. It may be desirable to index other visuals in the same file with photographic prints of negatives. Cards ideally might contain simple sketches or photographs of such visuals as charts and

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[23] Ibid., p. 143.

posters. Polaroid copies are easy to make, at little expense, and may be mounted on cards or put into a loose-leaf notebook index form. Even small operations will find a filing system valuable, especially as new visuals are added to the office. But, once started, it is vital that a filing system be kept up-to-date. There should be no half measures. It should be either kept complete and accurate or not kept at all.

VI. DISTRIBUTION

There are two general methods which have been adopted for the distribution of films. The first may be called the "special order" method and the second the "circuit" method. Each of these two methods, while quite distinct in purpose and operation, are varied in practice, and in certain cases both methods are used in the same department in the city schools. The "special order" method is usually followed in the distribution of films to the extension workers. The special-order method is simple in operation. A list of films available with the University Extension Film library is circulated among county agents and other state staff members. The county extension agents order a film to be sent to them on a certain day for showing. This is done by filling in the "order blank" and sending it in duplicate to the visual aids specialist, who will arrange for their circulation from the University Extension Film library. Orders are filled, in-so-far as possible, on the "first come-first served" basis. The rentals charged for films are paid for from the budget of the visual aids specialist.

The circuit method of distribution which is followed by many school systems may be described in this fashion. A department places a number of schools on a "circuit". The film is then taken from school to school on the circuit. This service is continued so that each school receives regular service at regular intervals throughout the school year. The special-order method of distribution serves a larger percent of schools in cities than does the circuit method.[24]

It is a common practice to distribute slides in sets. Stereographs are also sent out in sets, very frequently accompanying exhibits. The slides are also distributed by the special-order method, to the field force and to staff members at headquarters. The slides and films are circulated by a reservation system which is kept on a card file suitable for this purpose.[25]

All materials other than films are distributed by the special-order method. There are three methods used to distribute materials as far as transportation is concerned; the first is by the departmental truck; the second by messenger sent out by the department, and the third is by a messenger from the county office.[26]

VII. TRAINING

Extension specialists and agents today generally agree that to use visuals is to improve their teaching. They have the problems of how to

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[24]Dean McClusky, op. cit., pp. 102-103.

[25]Standard of Performance of the Associate Editor-Visual Aids (Knoxville: University of Tennessee Agricultural Extension Service, 1960), pp. 4. (Mimeographed)

[26]Dean McClusky, op. cit., p. 103.

prepare materials, how to use materials effectively and how to use visuals without disrupting other activities. Educators once were concerned with where to find visual material. They now face the more staggering problem of evaluating the tremendous amount of material available in order to decide which type best suits particular purposes. At any rate, before anyone can develop a training program he should learn all he can of the strong and weak areas in which training is necessary --just as he determines needs for a visual program. Through such efforts, it is possible to establish some rather important principles of democratic action while also creating objectives for the training program. These may be stated as follows:

1. To facilitate the continuous growth of individual and social personalities by providing all persons with opportunities to participate actively in all enterprises that concern them
2. To recognize that leadership is a function of every individual, and to encourage the exercise of leadership by each person in accordance with his interests, needs and abilities
3. To provide means by which persons can plan together, share their experiences and cooperatively evaluate their achievements
4. To place the responsibility for making decisions that affect the total enterprise with the group rather than with one or a few individuals

5. To achieve flexibility of organization to the end that necessary adjustments can readily be made.[27]

There are some suggested steps which might help in the development of a visual training program including:

1. Review Pertinent Literature. The latest books and brochures relating to visual instruction, planning, preparation and use of all visual aids, should be looked into. Items which might be of value to the training program itself should be abstracted.

2. Survey the needs and interests of individuals or groups who will participate in the program. The old requests for information, previous training of individuals, the skills and knowledge they already have, the equipment and facilities they have available for ready use should be re-examined. The individuals and their resources should be compared to see how to enlist their aid as legitimizers and discussion leaders.

3. Catalogue existing visual materials and equipment used in the organization. Such a listing might be helpful as an indication of available materials and experience. It might also provide reminders to trainees of items they might wish to re-use.

4. Establish an advisory group for training sessions. People should be included who have been exposed to other training programs, who are familiar with communication theory, who have successfully used visual materials, and who are professionals in the visual field as it relates

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[27]Hal R. Taylor, op. cit., p. 144.

to education, industry, church groups and others having state and national organizations. The groups must be asked to pool individual ideas and experiences relating to the problem of in-service training; to training in visual communication.

5. Prepare examples of multiple-use visuals. It should be shown how materials for one purpose have been adapted for another--how magazine and bulletin illustrations can be made into visuals for talks and exhibits, how slides may be converted to black-and-white enlargements and how actual objects (realia) may be substituted for experiences related to several different things.

6. Prepare a list of local sources of supply. Individuals in rural areas often may not realize that their nearby newspaper offices, hardware stores, grocery stores, stationery stores, dime stores, drug stores and lumber yards handle many of the items helpful in and necessary for making simple visuals. Included might be newsprint, posterboard, brushes and felt pens, India ink, poster paints, and peg boards. Local prices may be prohibitive, so the situation must be investigated and, if possible, a list of sources where quantity orders might lower prices, must be provided. Many times office closets, attics at home, even the local junk-yard may contain materials that will stimulate the imagination. Similarly, a list might provide names and addresses of suppliers of materials which are not available locally.[28]

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[28] Ibid., p. 145.

The National Visual Aids Workshop held at Cornell University, Ithaca, New York, in 1949 reported plans for in-service and pre-service visual training for present and prospective extension workers. The plans are being or have been adopted at present in most of the states. The plans reported by the workshop are detailed below.

A Plan for In-Service Visual Training

1. Interest must be maintained throughout the teaching program. This may be done through:

   a. district schools or workshops

   b. tip sheets

   c. the use of visual aids to present new results of research in the field of visual aids.

2. The production and proper use of visual aids must be taught. Specific recommendations include the following:

   a. It is recommended that a series of how-to-do-it leaflets be prepared by the Federal Extension Service, or cooperatively with the States, on the following subjects:

      1. Flannel graphs
      2. Flash cards
      3. Charts
      4. Slides
      5. Circular letters
      6. Floats
      7. Others

These can be prepared to fit into a looseleaf notebook so that each may be easily revised or replaced as conditions require.

b. It is also recommended that the following additional materials be prepared:

1. A slide set that shows the preparation, proper use and adaptations of the more important aids from the list in 2a above.

2. A one-or two-reel black and white, 16 mm sound motion picture on the proper utilization of the above aids, as well as the use of motion pictures (suggestions for the movie were to open with a picture of a county agent dropping into a visual aids specialist's office and asking for help with a special program he has to get across to his farmers, to have the specialist explain and show him the various methods that he could use in his work, to have the agent decide to use all possible methods, including radio and newspapers, and to have the specialist go with the agent and show him on actual location how to use the various methods).

3. Portable exhibits that illustrate the preparation and use of the aids listed in 2a above (the material mentioned in a and b should be coordinated so as to be complementary).

c. Conduct functional training schools to show small groups of agents how to prepare and use all visual aids. It must be emphasised that these schools are only a starting point in the training process. The training program should include every other teaching device available.

d. Various commercial companies have excellent training material. This is particularly true of companies manufacturing photographic materials and equipment. It is recommended that maximum use be made of these helps in the teaching of extension personnel.

e. Extension workers need continuous help and motivation to produce and use visual aids. Therefore, use:

1. individual conferences
2. tip sheets
3. exhibits
4. contests
5. periodic training schools.[29]

Special efforts to provide staff members with information and training in the various phases of production and use of illustrative materials are commonly made in most states. Several states have found the district-school for-a-day plan most successful. This involves, planning and conducting meetings covering the entire state and usually includes from three to eight counties in each meeting. Other states accomplish

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[29] Nell B. Leonard (ed.), "Training Extension Agents and Specialists," Report of The National Visual Aids Workshop at Cornell University (Ithaca, New York: Cornell University, 1949), pp. 11-12.

the training work by having the visual aids specialist appear frequently before conferences of "new" workers, at annual conference of all workers, at summer camps, in individual conferences and through use and distribution of visual aids tip sheets, and similar guides. Another approach used most successfully in states where visual work has been underway for some years (and where "schools" and conferences have been held in the past) is to expend considerable effort on the individual basis giving direct help until the worker shows proficiency in photography and visual work in general.[30]

A Plan to Encourage Pre-Service Training for Future Extension Workers.

1. The extension worker is essentially a teacher and consequently, in preparation for extension work needs to be trained not only in agricultural and home-economics subject matter, but also in the principles and practices of good teaching, including the use of visual aids, because:

   a. Visual aids play an important part in the teaching of all subject matter in extension work. It is just as essential that future extension workers be trained in visual aids as in any subject-matter field. Visual aids should receive emphasis as a separate course in the extension teaching methods syllabus.

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[30]George F. Johnson, Observation Relating to Visual Instruction Developments in 15 State Extension Services (Pennsylvania: Pennsylvania State College, 1950), pp. 7-8.

b. Modern techniques of communication have accustomed people to being reached with a wide variety of effective visual aids. Extension work should also use this approach to be up-to-date and to meet the intensive competition for people's attention and time. As extension work broadens its educational base with greater responsibilities, it needs to make use of visual techniques for reaching additional and larger segments of the population.

c. Basic pre-service training in visual aids for extension workers will save time and money by allowing in-service emphasis to be put on advanced and new techniques, which is always necessary with developments.

2. College administrators should be encouraged to recognize the need for pre-service training in visual aids for extension workers and to incorporate such training as a separate course in curricula for agricultural and home-economics students who plan to enter extension or some other public or commercial education work. The need for such training:

a. Should be pointed out to the appropriate committees of the American Association of Land Grant Colleges and Universities so that they can make suitable recommendations.

b. Should be pointed out to the national associations of county agents, home demonstration agents, 4-H club agents, and agricultural college editors.

c. Should demand the enlistment of the cooperation of other groups and professional societies in agriculture and home economics to support it.

3. A standard course in visual aids for future extension workers should include instruction in the creation and effective use of a variety of the common visual aids employed in good extension teaching. The following is a suggested outline for the content of such a course, not necessarily in chronological order:

a. orientation, background psychology, relation of visual aids to all teaching.

b. visual aids and their roles in meetings, demonstrations and the like

c. making visual aids

d. using visual aids effectively

e. practical student experience in the operation and use of equipment.

4. A functional course in general photography should be included in the curriculum of all students planning to enter extension work. The main objective of this course should be to demonstrate the wide potentialities of a camera in extension work. The secondary objective should be to develop skill in the use of various cameras.

5. A pre-service training course in visual aids, as well as agricultural and home-economics subject-matter courses, should be taught incorporating the wise use of appropriate visual aids so that the students will have the advantage of witnessing use of the best teaching methods and learn by example as well as by rule, because:

a. visual aids are tools to be used in many different teaching situations, and in undergraduate work they should not be restricted to special courses.

b. prospective extension workers who complete such a course in visual aids will be equipped to transmit their subject-matter information by the most attractive and interesting means so that more people will be reached more rapidly and effectively.[31]

VIII. FUNCTIONS OF A VISUAL AIDS SPECIALIST

There is no complete agreement among the States regarding the functions of a visual aids specialist and their designations. The following specific functions, however, seem to have crystallized: (1) following lines of authority; (2) assuming leadership responsibility; (3) developing and projecting program; (4) making annual plans of work; (5) conducting program operations; (6) using appropriate teaching methods and procedures; (7) assisting organizations; (8) performing special assignments and assisting with public affairs; (9) servicing the extension organization; (a) darkroom; (b) pool of equipment; (c) slides and films; (d) photographic file; (e) continuing professional improvement; (10) maintaining desirable public relations; (11) making reports and (12) using evaluation. Brief discusaion will be made below to clarify the meaning of each function.

1. Following lines of authority. The visual aids specialist works under the immediate supervision of the Editor, who is the head of the Information division, and in accordance with Memorandum of Understanding between the University and the U. S. Department of Agriculture, and the provisions of the Smith-Lever Act of 1914 as amended, and in accordance

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[31]Nell B. Leonard (ed.), op. cit., pp. 12-14.

with the project agreement for this work, gives leadership in visual aids and is the recognized authority in his field.

2. Assuming leadership responsibility. The Visual aids specialist represents the Director of the Extension Service in this whole subject matter field as it relates to Visual Information; acts in a liaison capacity between state and federal agencies in this field of Visual aids; and the state and county extension workers who serve the people of the counties and who represent the educational arm of the USDA and the University. He keeps himself informed on state and federal research findings and keeps work current by studying, analyzing and organizing information from all sources and preparing appropriate and adequate teaching and demonstration materials for the use of extension agents and others. He gives leadership in preparing special subject matter for and correlates Visual aids work with special intensive approaches such as Farm and Home Development, Rural Area Development, Weigh-a-Day-a-Month Milk Plan and Community Development and motivates acceptance of these methods among state and county workers.

3. Developing and projecting program. The visual aids specialist will have to recognize photographic and visual talents among workers and encourage development of these talents. He has also got to sense good ideas for visual aids that come from workers, and nurture and develop these ideas, provide the necessary follow through to successful production, then promote the widest possible use of the material during the period of its timeliness. Long-range planning, execution and evaluation are implicit here.

4. Making annual plans of work. He develops annual plans of work based on current trends of information established by administrative staff, specialists and agents and using long-range project program objectives for guidance. He selects visual materials supplied as aids to specialists, agents and administrators so that public meetings and published statements regarding subject matter and policy can be more clearly understood by intended audiences. After becoming informed concerning the purposes of programs, campaigns and policy aims, the Visual aids specialist attempts, as he plans, to (a) anticipate needs for visuals, (b) work with specialists in preparing copy, making photos, and producing same in quantities and qualities needed, (c) establish practical and adequate methods of distribution of visuals to county agents and to the press, and television.

5. Conducting program operations. (a) The visual aids specialist counsels with subject matter specialists and guides specialists in the preparation of visuals with high standards of legibility, clarity and interest to rural people. (b) Having determined the type of visual needed, the Visual aids specialist follows through to successful production of the needed art work, photographs, motion pictures, slides or charts. He also works to produce visuals of acceptable quality at the lowest possible cost by acquiring a broad working knowledge of, and acquaintance with, local and state artist, sign painters, photographers, printers, advertising agencies and others in the visual profession.

6. Using appropriate teaching methods and procedures. He works with the Information Office staff in all training activities relating to (a) photography; (b) use of projection equipment; (c) exhibits; (d) production of charts and graphs; (e) slides; (f) movies, and (g) communica-

tions--basic, written and visual. He also teaches individual members of the extension staff at headquarters in group-training meetings and individuals in counties, and supplies information to individuals through correspondence regarding "how to do it" or "what equipment to buy" for use by county and headquarters staff members.

7. Assisting organizations. He provides assistance to organizations such as community clubs, home demonstration clubs, 4-H clubs, Farm Bureau and other rural groups in the selecting and purchasing of visual aids equipment and in training someone to operate such equipment.

8. Performing special assignments and assisting with public affairs. He serves as a committee member, by virtue of appointment by the Dean, representing the College of Agriculture and the Extension Service on important civic bodies in the states.

9. Serving the extension organization

a. Dark room. He maintains and supervises a photographic darkroom equipped to develop and print photos and slides and supervises one full-time photographer-darkroom technician. All photo orders for three branches of the College of Agriculture are handled through this darkroom. All work is authorized by the preparation of a written order which is made by the department requesting service. Orders are filled, in-so-far as possible, on the "first come-first served" basis. Emergency services are performed when necessary. He keeps film, paper and chemicals in supply without waste, and maintains the equipment in the darkroom so as to assure the photographic quality demanded by the College of Agriculture for all its use.

b. Pool of Equipment. He secures and maintains projection equipment, easels, flannel boards, and other pieces of visual equipment used by teaching staff, extension specialists, and administrators.

c. Slides and films. He develops and maintains a library of slide sets for the use of county and headquarters staffs, ciruclates slides and films by a reservation system which is kept on a card file suitable for this purpose.

d. Photographic file. He files photographs and negatives for use by all departments in publications, magazines, articles, news releases and exhibits. New photographs and slides are made continually for news, technical and teaching purposes. Such visuals must be of high quality to meet the demands of the mass media outlets such as newspapers,, magazines and television.

e. Continuing professional improvement. He attends such training events as the National visual aids workshops, and visual workshops at the USDA, Washington.

10. Maintaining desirable public relations. He has to maintain public relations contacts with cooperating and related organizations by attending numerous meetings for the purpose of making pictures and providing news releases to press and radio. He has to give leadership to the visual phases of certain cooperative undertakings and encourage continued improvement in the proper use of visual aids by such organizations as Fair Associations, Farm Bureau, State Department of Agriculture, and other branches of the United States Department of Agriculture.

11. Making reports. He reports on the monthly report forms and it is combined into the annual report of the Office of Information. Special reports of field activities and training in the counties are made at least once each year. He keeps up with visual equipment in the counties and the use of this equipment in promoting the extension program, and uses his knowledge of visual method competency of agents as a basis for helping determine the needs for additional training for county staff members.

12. Using evaluation. He has to compare year to year reports and study special survey reports as a guide to future plans. He must also work to attain complete understanding of progress made by staff members as to their varying abilities to produce and to use good visual materials to strengthen the visual program year by year. Such continuing evaluation helps the visual specialist create interest in and guide the continuation of a visual program that should ultimately bring rural people and rural workers to better understand and use visual teaching to further extension's fundamental objectives.[32]

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[32]Standard of Performance of the Associate Editor-Visual Aids, op. cit., pp. 1-6.

CHAPTER VII

SUMMARY AND SUGGESTIONS

I. SUMMARY

It is hardly necessary to go outside the realm of daily experience to bring to mind the importance of visual communication in helping us form lasting impressions. Most educators find it more difficult to do an effective job of teaching without the aid of pictures and other visual materials. In studies of the comparative effectiveness of the various teaching methods commonly used by educators, experimental evidence has continued to favor the use of visual and audio-visual materials over other methods. Knowledge of these findings has caused educators to give more careful and increasing consideration to the use of such materials for training. An even larger number of schools and colleges are organizing audio-visual departments for the purpose of co-ordinating, testing and directing the acquistion and utilization of appropriate teaching materials. Today the use of visual and audio-visual materials is not regarded as mere use of instructional aids, but rather as an integral and important part of the curriculum.

People in many newly independent nations of the world are currently engaged in heroic efforts to try to increase both the quantity and quality of the food and fiber produced on their farms. One of the problems with which they are faced is how to make desired changes in a relatively short period of time. One way is through an active program of extension education. The extension worker is the "bridge," "the highway," the "link," between scientist and farmer.

of the educational system when the post-war Educational Development Plan was formulated in 1947. Its actual implementation on any considerable scale took place only during the first Five Year Plan (1951-1956).

India, indeed, has a fairly rich heritage of traditional forms of visual and auditory education, namely religious dances, dramas, puppet plays, story-telling groups, poetic symposia, mural paintings, cave drawings, and sculptures. Stage plays from ancient times are now being adapted to awaken the interest of children and the masses in the workings of democratic forms of government. Such aids have roots in ancient, but living, traditions.

The Raison d'etre of an Audio-Visual Policy for India.

Since the beginning of this century, many new techniques of teaching have been developed in response to the world-wide demand for education. It is a part of the Indian heritage, tradition, and legacy that in matters of education, as in other spheres, she has not clung to the past nor has she been dazzled by everything modern in visual and auditory equipments. A sense of balance and perspective has been maintained, so that the cumulative creative traditional visual and auditory media developed over the centuries have not been allowed to go into obscurity but are effectively harnessed for use to-day. It is necessary to state clearly the raison d'etre of an audio-visual policy for India. Although constitutionally education is the responsibility of the individual state governments, yet, in order not to waste the limited financial resources allocated to audio-visual educa-

tion, the Central Government has outlined a broad plan for audio-visual education in the states. Many problems in modern India could be solved only through the co-operation of the Central Government and the state administrations in the use of audio-visual aids to educate the masses as well as school children.

Background History of the Audio-Visual Aids Section

The Central Government of India Audio-Visual Aids Section had its early beginnings in 1942 as an adjunct to the library of the Central Advisory Board of Education, now known as the Central Education Library. It consisted of forty-four silent films and four silent film projectors put to occasional use in arranging film shows at Delhi and Simla. To investigate fully the problems of visual education in the field of primary, secondary, university and adult education, and ad hoc committee on visual education was formed and the committee held its first meeting in July, 1948. The main recommendations of the committee related to the planning, production and distribution of educational films, so that, in time, visual education might become an integral part of teaching. In 1950 the film unit was renamed the Audio-Visual Aids Section, and it undertook a systematic collection of filmstrips, charts, posters, maps and so on. In October, 1951, an All-India conference on audio-visual education was organized by the Central Ministry in which the state governments and some other representatives participated. Professor T. L. Green was invited by the government to advise on the development of audio-visual education in India.

The conference drew up the following eleven "action points" for implementation:

1. A Board of Visual Education representing educationists, teachers, technicians and other interested in this field, should be established to consider general policy programs
2. A full-time officer in each state education department should be appointed to develop audio-visual education
3. Exhibitions should be organized in different centres to popularize the use of, and to clarify ideas about, visual education
4. Teachers should be trained in visual education through training colleges and refresher courses, special stress being placed on how to use aids
5. Co-operation between teachers, educationists and commercial concerns for the production of visual aids should be encouraged
6. Training colleges and schools--both staff members and students--should be used for the production of suitable audio-visual aids.
7. Intelligent guidance should be provided in order to improve the standard, quality and variety of production
8. In each state some type of educational museum where children's books, journals and all types of visual aids--national and foreign--may be available for consultation and study by all concerned should be set up.

9. Methods of making projecting instruments as well as visual aids economically and encouragement of inter-state co-operation for the purpose should be explored
10. There should be effective co-ordination and use of educational broadcasing.
11. Audio-visual aids imported for educational institutions should be exempted from duty.

These recommendations were brought to the notice of the state governments for their consideration and necessary action. It was in accordance with the first recommendation that the National Board of Audio-Visual Education was formed. This is the co-ordinating agency for audio-visual activities in India. Under the first Five-Year Plan, 1951-56, the training of audio-visual experts was the only central scheme. Under the second Five-Year Plan, 1956-61, with the limited resources available, practical systematic development plans for audio-visual education were worked out. The multiple-purpose program covered three main aspects of audio-visual education: 1) administrative organization; 2) training, and 3) supply and production of material.[2]

Assistance to State Governments

There are various schemes proposed for implementation jointly by the central and state governments. The details are furnished below:

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[2] Ibid., pp. 333-335.

1. Audio-visual sections will be established on a state-wide basis. They will guide and direct audio-visual policy in the states and implement the recommendations of the National Board of Audio-Visual Education.
2. State audio-visual boards or committees will be set up. They will provide a link between the teachers in India and the National Board.
3. Training courses for audio-visual personnel at various levels will be organized.
4. Audio-visual aids libraries will be established on a state-wide basis. On account of the vastness and the diversity of the country, it is desirable that regional or state audio-visual libraries should be formed.
5. Equipment pools will be set up in district libraries.
6. Audio-visual education will be introduced into teacher training institutes.
7. Radio sets will be supplied to high and higher secondary schools.
8. Workshops for the production of non-projected visual aids will be set up and mobile audio-visual units established.

Thus, various schemes at the central and state levels are being implemented. The center meets fifty percent of the cost of the state government schemes. Through the concerted effort of the state and central governments audio-visual education for schools in India has been on a firm foundation from the very inception of the program.

In the Central Library there are at present 4,068 films, 1,558 filmstrips and 442 books. The films and filmstrips are acquired by the Central Film Library on the recommendations of a review committee. School teachers are also nominated to this committee. The library has 1,212 member institutions spread all over India. Films and filmstrips are loaned directly to schools and other educational institutions. The annual circulation of films is about 11,000. There are: 1) educational and instructional films; 2) children's entertainment films, and 3) full-length feature films, both Indian and foreign. The load on the Central Film Library is reduced because, in most of the states, audio-visual libraries have been established by now, and the state libraries loan films and other visual equipment to schools.[3]

The mobile cinema unit of the Central Ministry of Education and similar units in the states render unique help to schools by bringing to them the modern methods of teaching with projected and non-projected aids. It also carries out research and evaluation on a modest scale.

The Unit for the Production of Visual Aids (UPVA), attached to the Central Ministry of Education, carries out the following main duties:

1) the evaluation of existing non-projected material available in India;
2) the evaluation and research in technical and pedagogical matters;

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[3] Ibid., pp. 336-337.

3) the publication of brochures, monographs and leaflets on various aspects of audio-visual education, and

4) the advice and encouragement of present and prospective producers of non-projected aids. It will, therefore, be seen that the UPVA has been set up by the Central Government for the systematic production and guidance in the use of non-projected visual aids.

Latest Developments.

The National Advisory Board of Audio-visual Education which met in New Delhi in May, 1961 has recommended that the possibility of providing visual and auditory aids to all schools in the country by collecting small contributions from students be explored. The board also set up a sub-committee consisting of eminent educationists, specialists and administrators to advise the National Institute in the production of audio-visual aids, including class room instructional films. The board decided that candidates should be deputed if necessary to the Film Institute in Poona to receive training in script writing. Members of the board also suggested that educational films and filmstrips should be treated on a par with textbooks in so far as the sales tax was concerned.[4]

The National Institute of Audio-Visual Education

India, like other nations, has its quota of far-sighted educators who are convinced that visual and auditory education, given recognition, support and leadership can contribute significantly to

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[4]News item in The Hindu Weekly Review, May 22, 1961, p. 12.

the improvement and acceleration of India's educational program.

Therefore, in 1959--under India's second Five-Year Plan--the Ministry of Education, in co-operation with the Technical Co-operation Mission of United States in India, established a National Institute for Audio-Visual Education. The latest in audio-visual equipment, costing $195,000 will be provided by the Technical co-operation Mission. In addition the Americans agreed to provide one continuing consultant for a period of two years, supported by short-term consultants selected from leaders in the American audio-visual education movement, who will be invited to serve on the Institute's staff for a period of two or three months. The institute started its work in January 1959, with G. K. Athalye as the newly appointed Director, and Francis W. Noel as the U. S. Technical Advisor representing the Technical co-operation Mission. As presently concerned the functions of the Institute group themselves into six categories briefly described below:

Leadership. At the national level this implies leadership in ideas, in technical information and know-how in educational methods for the use of varied materials, in technical and educational research, in experimentation in some phases of production and in training personnel for this specialized field. This implies working with and through others, individuals, organizations, institutions and agencies of government.

Teacher Education. Training instructors and lecturers of teacher training institutions in the selection, preparation and use

of audio-visual instructional material and the organization and administration of audio-visual problems connected with education.

Research. Conducting research in the use and evaluation of various instructional aids. Among anticipated areas, survey investigations, curriculum research, utilization research, production and technical research and radio and television applications to education.

Production. A long-range, carefully planned, but flexible production program is needed in the fields of non-projected aids, teaching helps, and projected aids. The program will likely consider which visual and audio aids can be made by state or local units and which can be best produced by the Institute. It will also consider ways to assist private industry and other public agencies in the production of needed materials, particularly the materials and devices that can be produced with indigenous materials by village craftsmen and in village schools by both teacher and pupils.

Film Library and Distribution Service. The present film library will provide progressive leadership in the development of similar but independent libraries in state , City and Regional centres. It may also be expanded to handle distribution of non-circulating materials.

Consultation and Information Services. These are implicit in every function of the Institute-group meetings, individual communications, regional and national conferences and perhaps field workers.[5]

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[5]G. K. Athalye and Francis W. Noel, "Giant Stride in India," Audio-Visual Instruction, V (April, 1960), p. 106.

Its facilities for training personnel and for the production of instructional materials include: 1) a workshop; 2) a print shop; 3) a photo laboratory; 4) mobile audio-visual units; 5) a large auditorium; 6) a specialist library, and 7) a museum room. It will run a short-term course of two-and-a-half months' duration and a long-term course running for thirty six weeks.

Journals. Audio-Visual Education is published quarterly in English. This includes a Hindi section for the benefit of Hindi-reading teachers. It aims at fostering among teachers and social education workers interest in the use of audio-visual techniques in education, besides giving latest information about the Central Film Library of the Ministry of Education.

Instructional and Teaching Films. Under its various programs, the Ministry of Education sponsors classroom films every year. They are produced in English and Hindi at the Films Division, Bombay, of the Ministry of Information and Broadcasting. Negotations with the Ordnance Factory, Dehra Dun, will result in manufacture of 35 mm, filmstrip projectors on a mass scale. Every effort will be made to produce the projectors cheaply enough so as to be available for educational institutions. The communicty development centres have been supplied with film projectors for use in their areas.[6]

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[6]Narendra Kumar, "The Use of Radio in Education in India," Communication Media and The School, The Year Book of Education, 1960, George Z. F. Bereday and Joseph A. Lauwerys, editors (Tarrytown-on-Hudson, New York: World Book Company, 1960), p. 529.

II. THE PRESENT SITUATION IN THE MADRAS STATE AGRICULTURAL DEPARTMENT

"The prosperity of those who till the soil," it has been said "lies at the basis of India's prosperity." But the truth of this statement was realized by the British administrators only slowly and overtime. A series of famines with their tragic results gradually opened the eyes of the administrators to the shortcomings of a policy of absolute laissez faire and forced the Government to take a more positive attitude with regard to agriculture.[7]

By 1904, far-reaching changes of policy were made in the organization of agricultural departments all over India. The new policy laid a rightful emphasis on the inter-dependence of research, education and demonstration in all schemes designed for the uplift of the farming population, and the agricultural departments all over India were reorganized on this basis.[8] The various provincial departments are even today working on the lines laid down in 1904. But in rural education in India, Madras led the way by having the first agricultural institution of its kind as early as 1876.

Agricultural Research and Education

Paradoxically enough, the Agricultural College and Research Institute at Coimbatore has its origin in Saidpet, a suburb of Madras

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[7] B. V. Narayanaswamy and P. S. Narasimhan, The Economics of Indian Agriculture (Madras, RocHouse and Sons Limited, 1944), p. 454.

[8] Golden Jubilee Souvenir (Coimbatore: Agricultural College and Research Institute, July, 1957), p. 1.

city. A "model farm" was started in 1868 at Saidapet, and the first agricultural school was opened in 1876 near the site of the experimental "model farm." After a period of many vicissitudes, the Saidapet school was reorganized into a college for technical agriculture instruction with Mr. Walter Kees as the Principal. After the reorganization of the agricultural department in 1904, the existing facilities at Saidapet were felt wholly inadequate to meet the requirements of scientific work and so the venue was shifted in 1907 from Saidapet to Coimbatore.

The foundation stone of the present Research Institute at Coimbatore, was laid in January 1907, by Sir Arthur Lawley, the then Governor of Madras, who declared that the objective of the institution was the "culture of the land and the culture of people who cultivate the land." The same Governor opened the building when it was completed, on the 14th day of July, 1909. In the course of his opening address he emphasized the need for research and demonstration to go side by side with agricultural education, and foresaw the day when the very limited staff existing then, of one Agriculturist, one Botanist and a Chemist would expand to cover a much larger but as yet unknown field of agricultural science. In the course of the past fifty years, agricultural research as well as education has passed through many trying times in terms of both policy and finance, but in spite of these, it has built a fine tradition of earnest work for which due credit should be given to the sound foundations laid in the early years by

eminent British scientists like Drs. Barber, Harrison, Norris, Sampson, Parnell and Hilson.[9]

Starting from very small beginnings, with just three divisions, including Agriculture, Economic Botany and Chemistry, there are in the Institute now, full-fledged research sections for most of the important crops, as well as for plant pathology, and further divisions have been added in recent years to tackle problems relating to cytogenetics, plant physiology and agricultural meteoreology. In addition, the Institute is also the venue for various research schemes financed by the Indian Council of Agricultural Research, and Commodity Committees like the Indian Central Cotton Committee and Indian Oilseeds Committee. Besides this, there are numbers of regional research stations dotted over the state. Also, there is a separate section for research in agricultural engineering with the aim of devising improved agricultural implements suitable for local South Indian conditions.

By 1920, the Agricultural college was affiliated with the University of Madras, and the Diploma Course which was till then offered was replaced by the Degree of B. Sc. in Agriculture, with Intermediate in Science fixed as the minimum entrance qualification. The first batch of agricultural graduates was awarded their degree in 1923. In 1926, the number of admissions was raised to forty-eight and a separate building, the Freeman Building, was opened to provide greater accomodations and laboratory facilities for the students. The original building was retained as a research Institute.

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[9]Golden Jubliee Souvenir, op. cit., p. 5.

The two World Wars brought in many changes, and World War II, in particular, created not only very acute problems of food shortage but also a shortage of trained personnel, so that the admissions to the Agricultural College at Coimbatore were raised from forty-eight to ninety-six in 1944, to 108 in 1954,and to 162 in 1956, in order to provide trained hands to man the numerous projects and schemes programmed under the second Five Year Plan.

Post-graduate courses leading to M. Sc. in Agriculture and the Ph. D. were started in the year 1957, and a separate building was opened for graduate purposes in the year 1960. Since, 1953, a refresher course in agriculture has been conducted for young farmers. Similarly, gardeners are given intensive practical training in all items pertaining to selection and maintenance of gardens and orchard.

Extension

The whole Agricultural Department of Madras State is under the administrative control of a Director, with headquarters at Madras. He is usually a senior member of the Indian Administrative Service, or the old Indian Civil Service. He is the administrative head for all the three branches, namely: research; education, and extension. Directly under him is the Dean and Additional Director of Agriculture with headquarters at Coimbatore. The Dean and Additional Director of Agriculture is the head of the entire research and education wings of the department besides controlling all of the Research Stations in the State. All the departmental heads of research sections, teaching staff of both the Agricultural College and Post Graduate Institute at Coimbatore

and the Superintendents of regional research stations are responsible to him.

On the Extension side, the Director of Agriculture is assised by five Joint Directors of Agriculture, all having their headquarters at Madras. In addition one more Joint Director is working with headquarters at Tanjore, and is in charge of the Ford Package Scheme. For the purpose of propoganda, the State has been divided into four circles, each comprising three to four districts and each circle is placed under the charge of one Deputy Director of Agriculture. Under the control of the Deputy Director, there are District Agricultural Officers, each in charge of a District. To assist the District Agricultural Officers in the Extension Work there are a number of Taluk officers designated as Agricultural Demonstrators each in charge of a Taluk or specified jurisdiction. The Deputy Directors, District Agricultural officers and the Taluk Agricultural Demonstrators are responsible for the extension work in their respective jurisdictions. In addition, there is a staff for Plant protection at the Headquarters of the Districts. Also there are separate officers with adequate staffs designated as the Cotton Extension Officer, the Sugarcane Development Officer and the Oilseeds Development officer, whose main function is to spread improved varieties of seeds and improved methods of cultivation.

The specialists stationed at Coimbatore are in charge of research work only, controlling research work in their respective research stations.

Their contact with the extension wing is not as close as it is found in United States. In order to close the existing gap between research and extension wings, a new Extension Section wing was created at the suggestion of Professor Fay, of the Wisconsin University, who was working as Extension Advisor in the Agricultural College and Research Institute at Coimbatore. The newly created extension section consists of one Extension Specialist, two Assistant Extension Specialists, and one Assistant Extension Specialist (Survey Officer), five assistants, and seven artists, and one photographer.

The Extension Specialist is in charge of teaching of extension methods, maintenance of the central exhibition hall at the Research Institute, the collection of current research verified information to be tranfered to the farmers, suggesting new problems of farmers to specialists, organizing extension schemes and setting up objectives throughout the state, evaluation of extension methods and training undergraduates in extension methods.

Out of the two Assistant Extension Specialists, one is in charge of teaching undergraduates and also in charge of Central Exhibition in the Research Institute. The other Assistant Extension Specialist's job is to organize sample studies into the effective use of different methods of extension, which are being implemented.

The Assistant Extension Specialist (Survey Officer) is focussing attention on the spread of improved strains, utilization of improved implements and adoption of improved agricultural practices. He issues questionnaires periodically on the above subjects and evaluates progress made. The five assistants in the extension wing assist the officers' in carrying out the above mentioned duties.

There are nine artists in the Department, two in the Office of the Director of Agriculture and seven in Coimbatore and the latter are under the control of the Extension Specialist, along with one Photographer. The artists are now being employed to make posters, charts, exhibits, and graphs for exhibiting in important places. Each specialist section has prepared charts, posters and exhibits and has made exhibitions in the World Agricultural Fair in New Delhi, at the Exhibitions conducted yearly in various cities, as well as at the permanent Central Exhibition hall at the Agricultural College and Research Institute, Coimbatore, and also in their own sections. The photographer is being utilized for taking photographs for the research sections, student demonstrations and also for the exhibitions and important events in the college.

In addition to these officers, one Information Officer and a Campaign officer are attached to the Office of the Director of Agriculture, Madras. The duties of the Information Officer include arranging for the exhibitions conducted at the regional and all India levels, getting ideas for the same from the specialists, publishing the Villager's Calendar once in a year and "Mezhichelvam" a magazine issued by the department monthly, arranging for the preparation of posters and films on improved methods such as the Japanese method of paddy cultivation, tree planting, demonstration plots and balanced diet. The Journal Assistants attached to his office assist in the publication of the monthly magazine. The Information Officer is also provided with a projector for departmental use. The Campaign Officer at Madras, associated with the Information Officer, actually tours the state and implements the above ideas, arranges exhibitions and shows films on

improved methods. In fact the actual propoganda work is done by the Campaign Officer.

Community Development

After the attainment of independence, important changes have been effected in the extension side by the creation of National Extension Service and Community Development blocks. The main basis of the Community Development organization is a complete integration of all development activities at the village and block levels in a single agency. Community Development is a program of aided self-help to be planned and implemented by the villagers themselves, the Government offering only technical guidance and financial assistance. Its objectives are to develop self-reliance in the individual and initiative in the village community. Agriculture receives the highest priority in the program it being the mainstay of about seventy percent of the rural population. Among other activities included are provision of better communications, improvement in health and sanitation, better housing, wider education, measures for women's and children's welfare, and development of cottage and small scale industries.

In 1959, the Government decided to delegate the responsibility, power and resources for planning and execution of development programs to the people's institutions in accordance with the recommendations of the Study Team set up by the Committee on Plan Projects. In pursuance of this decision the states have enacted legislation with the result that Panchayat Raj will be ushered in with the introduction of statutory

Zila Parishads, Block Samitis and panchayats at the district, block and village levels, respectively. The panchayat, the co-operative and village school are the basic institutions for carrying out the program. Under the revised pattern, the whole country and including all of Madras State will be covered by the program by October, 1963.[10]

The role of the extension organization at the block and village level is two-fold. It carries proved knowledge or research of practical utility to the villages. It transmits the problems of the villagers back to research organizations for special study and solution.

With the expansion of the Community Development Program, the extension wing of the Agricultural Department has had to channel all its activities through the Community Development organization. The District Agricultural Officers now assist and guide the Agricultural Extension staff in the blocks, apart from their regular duties.

The grama sevaks are the ultimate points of contact with the villager. The grama sevaks who are multipurpose workers, are normally expected to attend to all agricultural work in the block. It has, however, been found in practice that the grama sevaks are not able to cope with a type of work which is of a technical nature and requires full-time attention. Hence, one extra fieldman had to be employed in each block headquarters to assist the Extension Officer (Agriculture). The grama sevaks receive two years training in the six Basic Training Schools dotted over the state, of which an Agricultural Department Officer is the Principal.

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[10] The Research and Reference Division, Ministry of Information and Broadcasting, Government of India, India, A Reference Manual 1960 (New Delhi: The Publications Division, Ministry of Information and Broadcasting, 1960), p. 210.

The National Extension Service and the Community Development programs are under a single combined separate department, called the "Community Development Organization". The efficacy of the working of this machinery and the close cooperation between the officers of the Community Development organization and the Agricultural Department is, therefore, one of the most important functions on which ultimate success depends.[11]

Madras State consists of thirteen districts, covering an area of 50,132 square miles with a population of 29,974, 936 people. There are 18,351 villages and 295 towns in the state. The regional language is Tamil. 238 tamil newspapers and periodicals are in existence with a circulation of 1,928,000.[12] The percentage of literacy in Madras State is 30.12.[13]

The Department of Agriculture as previously mentioned issues a monthly magazine in the regional language depicting the improved methods in Agriculture. Apart from this few publications are available for sale. Some respectable newspapers and other periodicals in English, as well as in Tamil, publish articles of interest to the farmers written by reputable persons. Wall newspapers have not been developed for organized use in the villages. Preparation and distribution of leaflets, pamphlets, circular letters and bulletins are done occasionally. The Agricultural Demonstrator contacts the farmers through farm and home visits, but

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[11] P. P. I. Vaidayanathan, A Critical Survey of the Food Production Programme in Madras State (Madras: Government Printing Press, 1958), p. 86.

[12] India, A. Reference Manual 1960, op. cit., pp. 15, 46, and 175.

[13] A. Mitra, "Population Trends and Literacy Rates in India, 1951-1961," The Hindu Weekly Review, (April 3, 1961), p. 11.

it is almost impossible to hope that each extension worker can contact all farmers in his juridiction. Farmer's Days and Field Days are arranged at Agricultural Research Stations once each year where farmers are addressed by the Departmental Officials. Apart from this, special meetings are convened for distribution of prizes for the winners in the crop competition, during tree planting week, compost week and other occasions when farmers are addressed by extension workers. These is a radio program for farmers every evening broadcasted by the All-India Radio Stations located in Madras and Trichinopoly.

One of the most important functions of the agricultural department is propoganda in favour of improved varieties, judicious manuring and improved cultural practices. In a state where illiteracy is so widespread as it is in Madras, ocular demonstration is found to be the best method of convincing the farmers of the advantages of agricultural improvement. Demonstration and observation plots as well as trial plots are laid out by the extension workers in representative villages to teach approved cultural, manurial and varietal methods. Posters are not exhibited in every village. There is a permanent Central Exhibition at the Agricultural College and Research Institute, Coimbatore, where posters and exhibits are displayed by all divisions of the Agricultural Department. Apart from this study ar also exhibited in the exhibitions conducted in regional and All-India levels. The farmers of the community Development areas taken on field trips to see things on actual farms and Research stations. Examples of specimens like seeds, fertilizers and livestock feed in glass bottles, weeds and crops dried and mounted on cards are kept in a few extension offices. Slides, filmstrips and motion pictures are used in a few places but there are few

facilities for making the same at present. The printing of the magazines and other publications are now made in the Government Press and the departments do not have any printing press. From the above mentioned details, it can be seen that no concentrated attempt has been made toward the liberal use of mass media which perform two principle functions--disseminating information to a wider audience and selling advertising.

As previously indicated the present rate of literacy in Madras state is 30.2 percent. This percentage for the rural population is known to be much lower. The vast majority of farmers are low in socio-economic status. Further, the situation is still more aggravated because extension workers are not reaching farmers who are relatively low in economic status. An Etawah study has shown that village level extension workers frequently contact only farmers of the middle or upper middle classes.[14] This in fact is verified by similar research in the U. S. Suitable action by extension workers toward reaching and teaching low income farmers is not only necessary but mandatory since the Community Development Program in India is meant for the entire rural segment of the population. Apart from this, extension and farm organizations have not yet developed in the villages to help in adoption of farm practices. There are different caste and religious groups and their customs and beliefs vary. So, in order to encourage greater farm practice adoption, the extension worker in India needs to

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[14]Albert Mayer, McKim Marriott and Richard L. Park, Pilot Project. India (California: University of California, 1959), p. 111.

reorient his methods of approach to reaching and teaching farmers who are predominantly illiterate, conservative, ignorant and victim of superstitious beliefs. If in the stagnant villages of the state is to be created a thirst for improvement, the results of research conducted by the research wing of the department must be communicated to the farmers, quickly and effectively, who then should be encouraged to put more information to practical use at a more rapid rate. Research indicates that visuals can help best in this communication process, particularly where literacy rates are low. Madras, at present like other states is striving hard to increase both the quality and quantity of food produced on its farms. To speed up this vital process the results of research must be communicated to the farmers in a shorter span of time than previously and more effectively.

Indian national leaders are emphasising the need for development of an educational system capable of carrying information to millions of people. In this matter, they are mindful of the implications for their nation of H. G. Well's famous words, "civilization is a race between education and catastrophe." As a result of this, various schemes at the central and state levels are being implemented.

Without depreciating the magnitude of the tasks ahead, observation and statistics reveal that startling progress has been made toward modernising Madras State agriculture through applications of science and technology. Within this atmosphere of technological change, and especially when crores of rupees are being spent for the development of agriculture, there must emerge a visual aids program in the Department of Agriculture which is effective enough to rapidly carry research

information to the millions of people living predominantly in villages -- to help more the tillers of the soil, the custodians of India's natural wealth whose conditions have not yet become completely satisfactory.

CHAPTER VII

SUMMARY AND SUGGESTIONS

I. SUMMARY

It is hardly necessary to go outside the realm of daily experience to bring to mind the importance of visual communication in helping us form lasting impressions. Most educators find it more difficult to do an effective job of teaching without the aid of pictures and other visual materials. In studies of the comparative effectiveness of the various teaching methods commonly used by educators, experimental evidence has continued to favor the use of visual and audio-visual materials over other methods. Knowledge of these findings has caused educators to give more careful and increasing consideration to the use of such materials for training. An even larger number of schools and colleges are organizing audio-visual departments for the purpose of co-ordinating, testing and directing the acquistion and utilization of appropriate teaching materials. Today the use of visual and audio-visual materials is not regarded as mere use of instructional aids, but rather as an integral and important part of the curriculum.

People in many newly independent nations of the world are currently engaged in heroic efforts to try to increase both the quantity and quality of the food and fiber produced on their farms. One of the problems with which they are faced is how to make desired changes in a relatively short period of time. One way is through an active program of extension education. The extension worker is the "bridge," "the highway," the "link," between scientist and farmer.

To a large measure the success of an extension worker as a teacher and the degree of progress made by his clientele will be determined by his ability to communicate ideas. If he is to be successful, the extension teacher should first recognize that accurate communication is probably one of his most difficult tasks. It is obvious that the effective teacher must train himself to be conscious of the differences found in his audiences, and to provide enough range and flexibility in his teaching methods to meet various audience situations. Visuals can help bridge the wide gaps in experience among individuals and provide a common background for all. Research indicates that if the teacher has an adequate understanding of the communication process, and if he makes proper use of visual materials and methods, the job can be done more successfully and more rapidly.

Below are listed some of the many reasons given by educational theorists explaining why they believe visual aids help in teaching.

1. They help to give correct initial concepts.

   One of the chief functions of visual instruction is to give the learner true mental impressions, or concepts, at the time he learns about a subject or process.

2. They intensify impressions.
3. They vitalize instructions.
4. They give different pictures of experiences in activities outside the persons environment (or realm of experience).
5. They give pictures of experiences with concrete things. Visual aids, such as photographs, give definite meanings to many words and thereby combat verbalism, or the use of words without attention to thought.

6. They arouse interest by attracting the attention of the learner.
7. They build and sustain interest.
8. They motivate.
9. They develop and change attitudes.
10. They supplement other learning.
11. They vary teaching.
12. They clarify.
13. They serve as reminders.
14. They save teaching time.

The visual aid movement has long passed its initial stages, and become a potent factor in many training situations in the United States. The phenomenal increases in the amount and efficiency of agricultural production that have taken place in the span of only two generations since the establishment of organized extension work in the United States, are adequate testimony to the soundness of extension teaching methods, and overall communication processes used.

The Cooperative Extension Service in each state in the United States is served by an Information Department which either forms part of the extension service itself, or is a section of a separate Publicity Department of the land grant college. The Information Department contributes to the speedy flow of results in a popular form, from research stations to county agents and farmers, through the provision of printed matter and visual aids. Relatively speaking Extension Departments or Services, in India, are nor so adequately equipped with trained personnel, visual aids,

technical material, propoganda releases or publicity. The provisions for adequate and suitable Information Services, in Indian States where they are not already available, is overdue. They should be made available so as to contribute to the further development of Indian agriculture at a more rapid rate.

India, at present, is striving hard to increase both the quality and abundance of food produced on its farms. To speed up this vital effort, the results of agricultural research must be communicated to the farmers, who in turn, should be encouraged to put more of the information to practical use at a more rapid rate. Where teaching aids are concerned, research indicates that visuals can help best in this communication process, particularly where literacy rates are low. With the present rate of literacy in India being 26.2 percent, it was believed that the present study would be valuable and beneficial to the Indian Extension teachers. At the same time, the apparent dearth of research-verified principles of visual communication (and learning), and the traditional resort to trial and error as the main basis for improvement of visual techniques in the United States and elsewhere make obvious the importance of such a study to extension workers everywhere.

The primary purposes of this study were: 1) to gather historical information about the development of visual aids used in extension work in the United States; 2) to review the generally accepted theories of visual communication, and 3) to study and summarize the research done on the effectiveness of various individual visual aids. A

secondary purpose was to utilize these findings as a basis for formulating a working plan for the development of a visual aids program in the Extension section at the Agricultural College at Coimbatore in Madras State, India. By such study and adaptation, it is hoped that extension teaching may be made richer and more meaningful both to extension workers as well as to those they educationally serve.

The library method of research was utilized. An investigation was made of available literature, published and unpublished, to gather general information about communication, and the types of visual aids used in extension work in the United States and elsewhere. Special efforts were made to collect and utilize literature authored by leaders in the field of visual aids research. After the data were gathered, they were analyzed and summarized and suggestions were made for their application to the development of the visual aids program for the extension section at the Agricultural College at Coimbatore in Madras State, India.

In order to serve as a useful guideline for the study, a short historical review of the development of visual aids in the United States was made under three headings namely: 1) Prior to 17th Century; 2) 17th Century to Early 20th Century, and 3) Recent Developments. Starting from its origin, which dates back at least to a time considerably prior to the 17th century, the visual aids movement has continued to grow steadily. Since World War II, there has been a tremendous expansion in efforts in visual and auditory fields. Signs of rapid growth have appeared in the upsurge of local, state, national and

international organizations, in textbooks and periodicals, in audio-visual departments in local school systems, and in research studies related to this area. The auditory and visual movement in education has grown to a point where an estimated 20 million dollars per year is spent on materials, equipment and services, exclusive of salaries. The accelerating rate of research in visual and auditory instructions in the past decade is seen in the 320 references given on this subject in the 1960 edition of the ENCYCLOPEDIA OF EDUCATIONAL RESEARCH; the 1950 edition contained only 120 references. There are about 104 public libraries which provide audio-visual aid services, and 305 agencies, mainly colleges, Universities, and State agencies that maintain audio-visual aid libraries.

A review of the generally accepted theories of visual communication was conducted, a communication model was developed and the goals of visual communication along with the principles involved were identified so as to assist in the organization of the study and to make it meaningful.

To a large degree, the success of an extension worker is determined by his ability to communicate good ideas to others. To those who would go out and work effectively in the field of extension education, the central challenge is to help rural people put useful knowledge to work for them. This requires effective communication. Extension educators as communicators, scientists as discoverers of truth and administrators as managers of programs, form a team that must be cast in the forefront of all developmental schemes in Extension work.

The scientist uncovers basic knowledge, the extension educator creates methods for communicating it to people and the administrator provides conditions that enable both the scientist and the communicator to play their roles effectively. In a broad sense, the extension educator derives from his knowledge of technology and extension processes, the principles and content from which he synthesizes a system of communication to achieve educational objectives. Hence, the extension worker as a communicator is the member of the team who creatively adapts the findings of science to the needs of people and devises communication schemes that enable them to understand technology and to put it to work.

Communication is the process of transfer of ideas, facts, feelings, or impressions between two or more people in ways that each gains a common understanding of the meaning, intent and use of the messages. Effective communication, therefore, is the essence of effective extension teaching. One cannot teach if he cannot communicate. Good communication does not consist merely of giving orders, but also of creating understanding. It does not consist merely of imparting knowledge, but also of helping people gain a clear view of the meaning of the knowledge. What is needed is more people saying the right things, at the right time, in the right way, to the right people. This is the formula for effective communication. Each episode of communication has at least three phases: 1) expression, 2) interpretation, and 3) response. What these <u>are</u> is the crucial point in communication.

Successful communication in extension education requires a skillful communicator sending a useful message, through proper channels, effectively presented to an appropriate audience that responds as desired. The communication task thus consists of skillful handling of these six key elements.

The concern with communication has produced many attempts over the years to develop models of the process, including descriptions and statements of elements. The Source-Message-Channel-Receiver (S.M.C.R.) model used in training programs of the National Project in Agricultural Communications, emphasizes the psychological nature of communication as it affects both the source and receiver in any communication situation. It has the special characteristics of providing an analysis of messages and on sensory channels in communication.

A research classification scheme is needed because, in planning a particular piece of visual communication, the kind of learning that is involved has got to be identified so that the psychological principles applicable to a particular problem which is dealt with can be known. While remaining consistent with the usual research categories, the classification scheme should at the same time be usable by those who are interested primarily in visual communication, and not in psychological research. In accordance with these criteria, the goals of visual communication may be classified under the following four headings:

1) to motivate people

2) to convey facts.

3) to explain something

4) to teach a perceptual motor skill.

These communication tasks need to be coordinated in a meaningful fashion with the categories that the psychologist uses in studying behaviour, particularly learning behaviour, since all these four communication problems are included in the psychology of learning.

In order to be useful in the future planning, production and use of visual aids for rural educational programs, a summary of research done on different visual aids was presented, with a series of principles which appear to govern the influence of each them. Following is the listing of principles governing the influence of different visual aids considered in the study.

Motion Pictures

1) Films have greatest influence when their content reinforces and extends previous knowledge; attitudes and motivation of the audience. They have least influence when previous knowledge is inadequate and when their content is antagonistic or contrary to the existing knowledge, attitudes and motivations of the audience.
2) The influence of a motion picture is more specific than general.
3) The influence of a motion picture is greater when the content of the film is directly relevant to the audience reaction that it is intended to influence.
4) Reactions to a motion picture vary with most or all of the following factors: film literacy; abstract intelligence; formal education; age; sex; previous experience with the subject, and prejudice or predisposition toward the subject.

5) The influence of a motion picture depends primarily on the strength of the visual presentation, and secondarily, on the value of the narration or commentary that goes with it. It is relatively unaffected by "slickness" of production as long as the meaning is clear.

6) An audience responds selectively to motion pictures, reacting to those things which it finds familiar and significant in the pictorial context in which the action takes place.

7) Individuals respond to a motion picture most effectively when the pictorial content is subjective for them.

8) Rate of development of the subject matter involved influences the instructional impact of a motion picture on its audience.

9) Established instructional techniques, properly built into the film or applied by the instructor, substantially increase the instructional effectiveness of a film.

10) The leadership qualities of the instructor affect the efficiency with which his class will learn from the film or filmstrip.

Filmstrips and slides.

1) Filmstrips and slides are effective means of communicating factual information and certain skills. However, a combination of these media with sound films or other materials is usually superior to any one medium alone.

2) The extent to which filmstrips or slides embody unique pictorial content of good quality has a direct bearing on their effectiveness in teaching.

3) The filmstrip is easy and convenient to use, takes up little space and is easily stored, is relatively inexpensive, is available either in color or black and white and can be used at any desired place because the pictures can be left on the screen as long as the instructor desires, the last point being of significance in many teaching situations.

4) Other advantages of filmstrips which have a bearing on their usefulness in instruction are: the pictures are in sequence; the room needs to be only slightly darkened, and they are, in most cases, available for a wide range of grade levels and subject areas.

5) The sequential order and unity of the filmstrip constitute one of its principal instructional characteristics.

6) To secure effective results, the instructor must first select filmstrips which tell their story primarily through pictures rather than words. Second, the pictures selected must be of such nature and quality as to contribute something at once significant and unique to the learning situation.

7) Slides and filmstrips are still picture media; they are of great value in visual teaching situations when motion is of little or no importance for comprehension.

8) They are inherently suited to the convenient presentation of a great variety of visual materials such as pictures, cartoons, charts, graphs, diagrams, maps and tables. Virtually anything that can be photographed can be put on a slide.

9) Both have attention-focussing power of any projected image.

10) Both can be made locally, though slides are much more easily prepared than filmstrips.

11) Rate of development and level of verbalization (as in narration or comments) varies in value in filmstrips.

12) Static subject matter can be treated extremely well with slides. Slides allow for an extended discussion of any subject that demands it.

13) Film and filmstrip comparisons involve many variables, and the content and pictorial techniques vary in both media.

Exhibits

1) Exhibits attract attention.

2) They are helpful in creating interest in solutions to farm and home problems and help farm people to make decisions to make changes.

3) They can be one of the principal channels through which the extension worker can reach and inform large numbers of people, including non-farm people.

4) People prefer simple exhibits so they can comprehend them at a glance.

5) The language of description of the exhibits should be kept simple.

6) Exhibits are more effective when reinforced with other media.

7) Visitors at fairs spend little time looking at exhibits. Therefore, it is necessary to use special methods for attracting attention, arousing interest and stimulating desire.

8) People like best the familiar and commonplace.

9) Exhibits can bring about improvements in habits of living including nutrition.

Pictorial Illustrations

1) Illustrations are an effective interest-getting device.

2) Illustrations may help the reader interpret and remember the content of the accompanying text-material.

3) Realistic, colored illustrations are more effective than black and white, but the amount of added effectiveness may not always be significant.

4) There is some question, as to the effectiveness of the addition of one color to black and white illustrations. Color, in the latter instance, may violate the realistic qualities of the illustration and may result in an end product that is not as effective as black-white illustration.

5) The larger the illustration, the more probable that it will attract attention. However, attention-getting qualities do not increase in mathematical proportion with the size.

6) Headlines or captions may help attract attention, but only if they are simple, complete and add something descriptive.

7) The content of the illustration must be related to the life and interest of the reader to be effective.

8) Illustrations are a degree of abstraction. They are interpreted according to past experience.

9) Illustrations preferred by children are not always those that are most attractive to the teacher.

10) Illustrations help develop attitudes, attract attention and motivate people to action.

11) People will not take time to figure out a picture; therefore, a picture should be such that it can be taken at a glance.

12) Action pictures are better than static pictures.

13) Pictures that show people expressing some observable emotion are more effective than those that do not.

14) People identify themselves with the subject of a picture.

Graphic Materials.

1) Accuracy in reading graphs is related to age, education and training or experience in the use of graphs.

2) Simple visual patterns with relatively few data tend to produce more specific recall.

3) A circle graph is a superior way of illustrating parts of a whole.

4) In estimating parts of a whole, the largest part tends to be under-estimated while the middle-sized parts tend to be over-estimated.

5) Accuracy of estimates drops when the number of dimensions of the graph increases.

6) Accuracy of estimates drops when the number of elements included in a single presentation increases, excepting in the case of the circle graph where the reverse is true.

7) Of the two types of graphs, pictorial and conventional, the pictorial graph is more easily understood.

8) To be easily comprehended, graphs must not be made too complex.

9) Readers require special training to enable them to understand graphic materials properly.

10) People usually understand diagrams better when they are accompanied by verbal explanations.

11) Certain types of data require certain types of diagrams.

12) Placing information in diagrams does not necessarily insure that the material will be understood and remembered better than when it is presented in a table of figures.

13) Posters must be designed so as to be understood instantly.

14) Posters with an emotional appeal are more effective than others.

15) A poster that shows a realistic picture will be better understood than one showing a symbolic picture.

16) Humorous cartoons can be used only when they will not offend.

Proper selection of visuals requires recognition of the fact that there is no one best tool in the visual aids kit. In fact, there is

no one best tool of any kind in communication. Each has appropriate applications and each has conditions under which it should not be used. The responsibility of the person who uses visual aids is to get to know the characteristics of the various media and select the best combinations of media for particular situations. There is no one best solution for all problem situations. A summary of selected generalizations about the use of visual aids will be given below.

1. Visual aids should be viewed as being merely an aid in the teaching process. They do not teach in and of themselves.
2. Almost anything that has been said about the general teaching process should be seen to apply to the use of visual aids. Among such observations the following might be included:
   a. A visual aid is most effective if it presents one central idea.
   b. The more often a visual aid is used and the greater the number of exposures, the greater the number of people that will be reached.
   c. The greater the number of visual aids used (within limits of expense) the greater the likelihood of learning.
3. The more that visual aids are integrated with oral teaching, the more likely they are to be effective.

Surveys indicate that the visual and auditory education idea, has been accepted in American education with unprecedented speed within a very short space of time. Any area of American educational

practice that enjoys such a rapid growth and importance merits serious consideration in the planning that is done continuously. For this reason a chapter was devoted to a discussion of the administration of visual programs.

The job of the agricultural information office is to gather accurate and useful information, package it and provide for its transmission to the people in ways that they will understand. In establishing such an office, the six generally-stated steps given below should be considered.

1. Determine and appraise the sources of knowledge.
2. Determine and analyse the audience.
3. Appraise available facilities.
4. Decide what services are best for the situation.
5. Develop an information staff.
6. Obtain needed equipment.

Some of guideposts that should be followed in the establishment of an information office are listed below by way of summary.

1. The agricultural information office should be responsible to agricultural administration and should be housed with this administration
2. All agricultural information workers should be responsible to the head of the agricultural information office
3. Agricultural information should be coordinated with other institutional or agency facilities, but should not be under the control of non-agricultural officials.

4. The head of the agricultural information office should participate in the administration's development of programs and policies.
5. Agricultural information staffs should be composed of specialists, each assigned to do a particular type of job.
6. There is need for evaluation and research into the effectiveness of all methods of communication to determine the best combinations to use.
7. Communication training involves two areas: training of professional communication workers, and training of those who use communication skills as tools in research and extension teaching.

While the first responsibility of the visual aids service is to the extension staff, consideration must be given to making the materials of the service available to other departments of the colleges and to other colleges of the university. Close contacts and associations must also be maintained with all branches of agricultural departments and with other state services to insure efficient utilization of all new visual developments.

Individuals who must develop a program in the use of visual communication can rely on two key points useful as guideposts to progress. First, many effective visual materials do not always require a large budget and often can be constructed or improvised from materials already available. Second, the artistic skill or talent of the person who plans to use visuals is much less important than his common sense, alertness to new possibilities and sincere interest in helping others learn.

Functions of a visual unit are summarized below.

1. Providing materials and professional services so instructors can use visual materials under the best possible conditions.
2. Providing those services which make it possible for instructors to have materials and equipment when they need them.
3. Providing materials and services which allow specialists or agents to select and use materials which fit their teaching-learning situations.
4. Providing those services which will help instructors make full use of local resources already available.
5. Providing those services that will assure development of instructor competency in use of visuals as well as supervisor-administrator competency.

The administration of visual aids program consists of: 1) production; 2) service and 3) training. The question of production really hinges on the availability, cost and the learning value of the material to be produced. Each producer will have to consider and weigh these three points before he can decide whether he should produce or not.

Problems of filing, storing and adapting visuals should be solved by routine and simple methods. Storage spaces should be located for charts, posters, exhibit panels and equipment close together so that each item has an assigned spot. If possible, an indexing system for photographic negatives should be arranged to include other materials and equipment. The Agdex system of filing, developed by the National Project in Agricultural Communications for agricultural publications

should be adapted to filing visual materials just as should many of the other filing systems already in use by the state extension services.

There are two general methods which have been adopted for the distribution of filsm. The first may be called the "circuit" method and the second, the "special-order" method. All materials other than films are distributed by the special-order method.

Training in visual communication is necessary if specialists, agents, and administrators are to become competent in the preparation and use of visual materials. A variety of methods for training are possible. Following is a list of suggestions that have been found to be of help in this regard.

1. Review literature in order to be able to discuss questions which may arise; catalog existing materials and equipment now used.
2. Establish an advisory group for training sessions. They may be asked to help survey the individuals or groups to be trained.
3. Prepare examples of multiple-use visuals; keep workshop problems localized; use homemade materials when possible; and distribute pertinent information about sources of supply.

In-service training for the staff may be done through use of: 1) individual conferences; 2) tip sheets; 3) district schools or workshops; 4) exhibits; 5) contests; 6) periodic training schools and 7) annual-state wide conferences.

College administrators should be encouraged to recognize the need for pre-service training in visual aids for extension workers and to incorporate such training as a separate course in the curricula for agricultural students who plan to enter extension education as a life's work.

There are certain specific functions which a visual aids specialist has to perform, including: 1. assuming leadership responsibility for the visual program; 2. developing the visual program; 3. making annual plans of work; 4. conducting program operations; 5. studying and selecting appropriate teaching methods and procedures; 6. assisting appropriate organizations; 7. performing special assignments and assisting in public affairs; 8. serving the extension organization with: a. dark room, b. a pool of equipment, c. slides and films, d. a photographic file, e. continuing professional improvement, 9. establishing and maintaining effective public relations; 10. making reports, and 11. using evaluation. The key to successful administration is a focus on the people to be served and on personnel. Certainly if a communication point-of-view is to have value, it should be put to use by communication specialists in their own administrative practices.

Growth in the use of mass media in India and the present situation in the Agricultural Department, Madras State, India, were considered to substantiate the necessity for developing a visual aids program and for applying research findings reviewed for the present study.

In its strictest modern sense, visual and auditory education is comparatively new in India. Although constitutionally education is the responsibility of the individual state governments, yet, in

order not to waste the limited financial resources allocated to audio-visual education, the Central Government has outlined a broad plan for audio-visual education. Many problems in modern India can be solved only through the co-operation of the central government and the state administrations in the use of audio-visual aids to educate the masses as well as school children.

The central government of India Audio-Visual aids section had its early beginnings in 1942. To investigate fully the problems of visual education in the field of primary, secondary, university and adult education, an ad hoc committee on visual education was formed in the year 1948. The main recommendations of the committee related to the planning, production and distribution of educational films so that, in time, visual education might become an integral part of teaching. In 1950 the film unit was renamed the Audio-Visual Aids Section, and it undertook a systematic collection of different visual aids. An All-India conference on audio-visual education, convened in October, 1951, drew up eleven "action points" for implementation. In addition, various schemes have been proposed for implementation jointly by the central and state governments. The National Advisory Board of Audio-Visual Education which recently met at Delhi has recommended that the possibility of providing visual and auditory aids to schools in the country by collecting small contributions from students be explored.

In 1959, under India's second Five Year Plan, the Ministry of Education, in co-operation with the Technical Co-operation Mission of

the United States in India, established a National Institute for Audio-Visual Education. The latest in audio-visual equipment, costing $195,000 was provided for through the Technical Co-operation Mission. America has also agreed to provide one continuing consultant for a period of two years, supported by short-term consultants provided for periods of from two to three months each. As presently outlined, the functions of the Institute group themselves into the following six categories: 1) Leader-ship; 2) Teacher Education; 3) Research; 4) Production; 5) Film Library and Distribution Service, and 6) Consultation and Information service.

Under the first Five-Year Plan, 1951-56, the training of audio-visual experts was the only central scheme. Under the second Five-Year Plan, 1956-61, with the limited resources available, practical systematic development plans for audio-visual education were worked out. The multiple purpose program covered three main aspects of audio-visual education: 1) administrative organization; 2) training, and 3) supply and production of material. Schemes were also formulated for inclusion in the third Five-Year Plan, which started in 1961, for the further development of audio-visual education. They fall into three main categories, including: 1) the central audio-visual schemes; 2) the centrally sponsored schemes, and 3) the centrally aided schemes.

The Research Institute at Coimbatore was opened in 1909 and is still in operation. Starting from a very small beginning with one agriculturist, one botanist and a chemist, there are in the Institute now full-fledged research sections for most of the important crops as well as plant pathology, and further divisions have been added in recent

years to tackle problems relating to cytogenetics, plant physiology and agricultural meteorology, besides being the venue of research schemes financed by the Indian Council of Agricultural Research and various commodity committees.

By 1920, the Agricultural College was affiliated with the University of Madras, and since that time the B. Sc. Degree course in Agriculture has been offered. In addition, post graduate courses leading to the M. Sc. and the Ph. D. degrees in Agriculture were started in 1957.

The Agricultural Department in Madras State is under the control of a Director, who is the administrative head of research, teaching and extension wings of the department. On the extension side, he is assisted by six joint directors, four deputy directors, besides a number of District and Taluk officers. On the research and teaching side he is assisted by the Dean and Additional Director of Agriculture.

A new extension section was created in 1959, consisting of one Extension Specialist, two Assistant Extension Specialists, and one Assistant Extension Specialist (Survey Officer), five assistants, seven artists and one photographer. The overall functions of the extension wing are to provide for: liaison between research and extension wings of the department; teaching of undergraduates; organizing of extension schemes and setting up of purposeful objectives; evaluation of extension methods; maintenance of a central exhibition in the Research Institute, and organizing of appropriate sample studies. The artists are employed to make posters, charts, exhibits, and graphs for the research and

teaching sections, as well as to plan and produce exhibitions in which the department takes part. The photographer is utilized for taking photographs for the research and teaching sections and student demonstrations, as well as for exhibitions and other important events, at the college.

In addition, an Information Officer and a Campaign Officer are stationed at Madras, assisted by two journal assistants and two artists. The duties of the Information Officer include: arranging for exhibitions conducted at the regional and all India levels; getting ideas for the same from specialists; publishing "Mezhichelvam," a monthly departmental magazine, and an annual Villager's Calendar, and arranging for the preparation of posters and films on improved farming methods. The Campaign Officer at Madras, associated with the Information Officer, actually tours the state and implements the above ideas, arranges for exhibitions and shows films on improved farming methods.

After the attainment of Indian independence in 1947, a new organization, called the Community Development organization, was created with the idea of complete integration of all development activities, at the village and block levels into a single agency. The grama sevaks of this department are the primary points of contact with the villagers and constitute the "spearpoint" of the Agricultural Extension work. Based on the recommendations made by the study team set up by the Committee on Planning Projects in 1959, the states have enacted legislation with the result that a Panchayat Raj will be

introduced with the inclusion of statutory Zilla Parishads, Block Panchayat Samitis and panchayats (legally appointed committees at the district, block and village levels, respectively). The panchayat, the co-operative and village school are the basic institutions in the village for carrying out the program. Under the revised program, the whole state of Madras, will be covered by the program before October, 1963. With the expansion of the Community Development Program, the extension wing of the Agricultural Department has to channel all its activities through the Community Development organization , since the entire community development program is under the control of a separate department.

In addition to the use of visuals already mentioned, extension teaching is being carried out in Madras State by means of individual contacts, group methods, including field trips and meetings, and by providing for observation, demonstration and trial plots in representative villages. Besides Farmers' days, Field days are conducted by the Agricultural Research Stations. Few publications are available for sale. Preparation and distribution of leaflets, pamphlets, circular letters and bulletins are done on occasion. Some respectable newspapers and periodicals in English, as well as in regional languages., feature articles of interest to the farmers.

Research in India has indicated that extension workers are not reaching farmers who are relatively low in economic status, but frequently contact only farmers of the middle or upper middle classes. Apart from this, extension and farm organizations have not yet developed sufficiently

enough in the villages to help in the adoption of farm practices. So, in order to encourage greater farm practice adoption, the extension worker in India needs to reorient his methods of approach to reaching and teaching farmers who are predominantly illiterate, conservative; ignorant and victims of superstitious beliefs. If in the stagnant villages of the state a thirst for improvement is to be created, the results of research conducted by the research wing must be communicated to the farmers quickly and effectively. They should be encouraged to put more information to practical use at a more rapid rate. Research indicates that visuals can help best in this communication process, particularly where literacy is low.

Observation and statistics reveal that startling progress has been made toward modernizing Madras State through applications of science and technology. Within this atmosphere of technological change, and especially when crores of rupees are being spent for the development of Agriculture, there must emerge a visual aids section in the Department of Agriculture which can effectively carry research information to the teeming millions living predominantly in villages. Thus will the tillers of the soil be motivated to make efforts to ameliorate their conditions.

II. SUGGESTIONS FOR THE ESTABLISHMENT OF A VISUAL AIDS SECTION AT THE AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE AT COIMBATORE, MADRAS STATE INDIA

With these ideas in mind, the suggestions listed below are made for the establishment of a visual aids section at the Agricultural

College and Research Institute at Coimbatore, Madras State, India.

1) With the financial assistance and technical assistance of the National Government of India, the Government of Madras State should provide for the creation of a visual aids section in the Department of Agriculture, including necessary staff and funds for the same.

2) The visual aids section should be housed in the Agricultural College and Research Institute, Coimbatore, and should be responsible to the agricultural administration of Madras State.

3) The visual aids section should be under the direct control of the Dean and Additional Director of Agriculture, Coimbatore, for the present and should work in close co-operation with the Extension section of the college.

4) After the post graduate degree course in extension is introduced, the present post of Extension Specialist should be upgraded and the position designated as Extension Specialist and Professor of Extension. The visual aids section should then be brought under his control and made a part of the Extension section so as to insure complete coordination of functions.

5) The newly created visual aids section, apart from ministering to the needs of the Research and Teaching Wings of the department of Agriculture, should channel a major portion of its activities through the Agricultural Extension Wing of the Community Development Organization, which is expected to cover the entire state of Madras by October, 1963.

6) The effective existing extension teaching methods of individual contacts, such as farm and home visits and result demonstrations, and group contacts like method demonstrations and field-trips, should be continued to be used as bases for year-round extension teaching. The visual aids should be used in addition to the above methods and should not be considered as a substitute for the above techniques.

7) The funds needed for the operation of the visual aids section at Coimbatore should be provided for from the budget of the Agricultural Department. This will include the salary of the staff, travelling allowances, cost of materials and equipment , postage, preparation and purchase of materials for Agricultural Research and Teaching sections. However, the section should recover cost of materials supplied to the Blocks and other agencies through rental and sale of copies.

8) Each block each year should be allotted separate funds for the development of visual aids teaching in that area. This expenditure should be met with from the budget of the Community Development Organization. Expenditure incurred by each block towards the purchase and preparation of materials and equipment should be in accordance with the instructions of the Visual Aids Specialist.

9) It is also essential that the expense of buying and handling visual materials circulated by the visual aids center be recognized as a definite obligation of each block.

10) Since the Department of Agriculture and the Community Development Organization are two separate departments, but both are jointly responsible for agricultural extension work within the State of Madras, the efficacy of the working of the visual aids section depends on the kind of co-operation existing between the officers of the two departments and is, therefore, one of the most important functions on which the ultimate success of the visual aids section depends.

11) The Government of Madras may wish to consider the appointment of a State Consulting Committee consisting of the Director of Agriculture, Dean and Additional Director of Agriculture, Coimbatore, Extension Specialist, Visual Aids Specialist, Director of the Community Development Organization and three representatives of the Community Development Organization chosen by its Director. The functions of the committee should be to:

a. Advice the government on all matters of policy relating to the visual aids program throughout the state of Madras.

b. Maintain a proper balance of visual aids services for the entire extension staff.

c. Determine where additional resources should be placed to meet special situations and programs that need particular emphasis.

d. Undertake such actions as are necessary to insure co-ordination and cooperation between the Agricultural Department and Community Development organization.

e. Determine the funds required each year to meet the growing needs of the visual aids service and making recommendations for their allocation.

f. Invite the Technical Cooperation Mission experts at Delhi and group leader at Bangalore to give suggestions for the improvement of visual aids program in Madras State, and explore possibilities for getting help toward the purchase of equipment, books and materials from the International Cooperation Administration Equipment Aid Fund.

g. Select and depute persons for further training at The National Institute of Audio-Visual Education at Delhi and the Film Institute at Poona.

h. Take necessary action to maintain close contact with the National Institute of Audio-Visual Education, Delhi, state audio-visual department, and institutions and bodies in other states, as well as in other countries, so that there may be free exchange of information, ideas and materials.

i. Advance planning of extension programs at state and block levels, and advance consideration of the visual aids and other information tools that can assist in accomplishing the objectives of extension programs.

12) The work of the visual aids section should be that of rendering on-campus and off-campus services involving selection, production, distribution, teaching, assistance

in the utilization of more important types of visual materials, and the preparation of visual aids from the locally available materials.

13) The visual aids section should be headed by an officer equal in rank to the Deputy Director's cadre of the Madras Agricultural Service, and he should be designated as the Visual Aids Specialist.

14) The Visual Aids Specialist should be selected by the Madras Public Service Commission either by direct recruitment or by promotion from the department on the basis of the ad hoc rules framed by the Government of Madras.

15) The minimum qualifications of a Visual Aids Specialist, as prescribed by the ad hoc rules, might include, though not be limited to, the following:

a. must have completed a B. Sc. degree in agriculture

b. should have had special training in several fields of visual presentation

c. should have had training in journalism (preferably)

d. should have completed a Masters degree (desirable but not necessary)

e. must have had not less than five years of experience in extension work or a combination of extension and other educational work of a similar nature.

f. must have had experience in training others in production and use of visuals.

g. should have had technical experience in one or more areas of visual production or presentation, such as photography, production of slides, movies, exhibits or art work.

h. should have knowledge of the organization, objectives and scope of the Agricultural Extension Service

i. must have a knowledge of visual equipment used, or to be used, in extension program, of appropriate educational use to be made of visual aids, and should be able to teach others how to use them in the extension program

j. should have the ability to recognize social and economic conditions and to plan and direct informational programs to correct undesirable conditions'

k. must have the personality and ability to work effectively and harmoniously with research, teaching, state, block and village level extension workers, representatives of other agencies, farm people, representatives of various mass media, and the public in general

l. must have the ability to train members of the staff in techniques of visual presentation and to train extension staff members individually and in groups

m. must have the ability to demonstrate constantly the place and value of visual aids and must keep informed on the needs and problems of extension workers.

16) The Director of Agricultural needs to prepare a job description of the Visual Aids Specialist, pertaining to his functions. They may be designated as follows:

a. Working under the immediate supervision of the Dean and Additional Director of Agriculture, Coimbatore, and in close cooperation with the Extension Specialist and his staff.

b. Having responsibility for the selection, production and distribution of visual aids such as photos, slides and movies, for use by extension staff members, as well as the staff members of the teaching and research sections of the college

c. Taking leadership in providing photographs for bulletins and publications. This includes taking original pictures, finding suitable pictures for such uses, maintaining a file of photographs and negatives and determining the best possible use of such photographs. Photography includes also taking slides and making filmstrips, as per the requirement of the extension, research and teaching section purposes.

d. Working with the Extension Specialist and the Heads of research sections in planning and producing slides, filmstrips and other visual aids on subjects determined by the specialists.

e. Consulting with the Extension Specialist in circulating slides, filmstrips and other visual aids

f. Maintaining a library of slides, filmstrips, motion pictures and other visual aids, and circulating them to the field force and to staff members at headquarters.

g. Planning layouts for all types of art work including charts, posters, wall newspapers and picture layouts for publications

h. Planning exhibits for state and All-India exhibitions in cooperation with Extension Specialist and research and teaching staff members. Once the exhibit has passed the planning stage, the Visual Aids Specialist should attend to matters of production of art work, equipment and other details of actual production with the help of artists and other staff members under him

i. Circulating films housed in the mobile vans to the blocks in a systematic way and maintaining them properly

j. Equipping the extension service with appropriate projectors, flannel boards, charts, posters, wall newspapers and other visual aids, and small useful articles and tools for producing visual materials locally

k. Training extension personnel in the production and use of visual aids, and in the handling of visual aids equipment

l. Making contacts and promoting cooperation with all other agencies that deal with the use of mass media, and keeping informed on developments in the visual communication field

m. Taking part in regular departmental staff meetings, departmental seminars, study group meetings and farmers' and field days at Research Stations, and making appropriate use of visual aids wherever possible. Attending other state and All-India conferences relating to visual aids.

17) The Visual Aids Specialist needs to have the following staff, and he should prepare job descriptions for each of them detailing the definite functions and responsibilities they will have:

a. Two Assistant Visual Aids Specialists

b. Two Journal Assistants

c. Two Research Assistants

d. Two Photographers

e. All the artists now working in the Department

f. Three technicians

g. One trained person to work offset duplication and mimeograph machines

h. Two stenographers, two clerks and one store keeper.

18) The minimum equipment required should include:

a. Two mobile vans fitted with dynamos, and provided with projectors, microphones, a set of portable exhibits and other equipment

b. Three 35 mm automatic cameras

c. One film projector for use on-campus

d. Two Filmstrips and 2" x 2" Slide projectors

e. Two mimeograph machines and one offset duplicator

f. A projector for 3 1/4" x 4" slides

g. Two typewriting machines

h. Storage facilities for films, filmstrips, slides and other visual aids

i. Three portable screens

j. One public address system

k. One paper-cutter and two stapling-machines

l. Other necessary accessories and equipment.

19) A long range, carefully-planned but flexible production program should be followed. The program must consider: a) which visual aids can be made by the staff in the blocks locally; b) which can be produced by the visual centre, and c) ways to assist private industry and other public agencies in the production of needed materials, particularly the materials and devices that can be produced with indigenous materials by village craftsmen.

20) The work of the visual section on the extension side should first start at the block level and then should be extended to the village in course of time. To start with, each block extension staff should be assisted to prepare and keep the visual aids listed below (they should be properly labelled and should be portable to be carried to villages).

a. Examples of specimens like seeds, fertilizers and insecticides, kept in capped transparent glass jars.

b. A glass-covered insect box in which common insects affecting the important crops are pinned and mounted.

c. Dried specimens of crops, grasses and legumes mounted on sheets of card-board or woven matting.

d. A series of crop specimens, showing different stages of growth, chlorosis and diseases at a glance, mounted on on thin boards of the sizes required to hold them. The possibility of using clear liquid plastic for mounted specimens may be considered at a later date.

e. Roll-up chalkboard made by heavy cloth, canvas or oil-cloth coated with chalk board paint slating.

f. Paper pads made from unused newspaper stock, white butcher paper or brown wrapping paper.

g. A flannel graph. The material for the surface may be cotton, flannel, felt, or any rough-textured cloth or khadi, and the symbols backed with rough-textured cloth, sandpaper or flocking.

h. Models or dioramas may be constructed (as per ideas given by the Visual Aids Specialist) wherever facilities and talents are available, using such materials as clay, sawdust and shredded rubber.

i. A glass-covered bulletin board should be mounted on a wall in a prominent place in each village. Items like labelled specimens, posters, wall newspapers, leaflets and illustrated bulletins should be used in the bulletin boards.

21) Though research has indicated that the motion picture is the best of all visuals, consideration must be given to the exhorbitant cost that will be involved in their production and maintenance due to non-availability of the materials at present. Therefore, it will be well for the visual aids section to enter into contractual arrangements with the State Visual Aids Department, National Institute of Audio-Visual Education at Delhi, TCM, commercial producers and other sources for the production or supply of films for use in the department.

22) Each of the two mobile cinema units provided with a technician should be located in a centrally-located place, and should be made to tour the villages on a circuit, so that each block will receive service at regular intervals.

23) With the expected mass production of filmstrip projectors by the Ordnance Factory at Dehradun, it should be the long-range goal of the visual aids section to provide each block with one filmstrip and 2" x 2" slide projector with provision for fitting 5" and 7" lenses adjustable to single or double-frame projection.

24) In view of the fact they they are economical, compact, easy to maintain, file and store, simple to project and valuable for prolonged study and discussion, it should be the aim of the visual aids section to concentrate on the production of filmstrips and slides made with the 35 mm camera on every subject, development scheme and campaign. The preparation

of filmstrips and slides should be done in consultation with the Extension Specialist and Heads of research departments.

25) In addition, filmstrips can also be obtained on loan and circulated from the: a) Development Commissioners, b) Education Department, c) Health Department, d) Indian Council of Agricultural Research and e) United States TCM office.

26) It is desirable that each block should have one projector for 3 1/4" x 4" slides. This will facilitate preparing hand-made slides locally on etched glass, translucent plastic, cellophane or clear glass, after sufficient training has been given to the extension workers.

27) The visual aids section should aim at producing and supplying (at cost) combinations of visuals that can be used for various purposes. The following suggestions are made in this regard:

a. Produce flipbooks which combine some of the advantages of paper pad, chalkboard, flannelgraph and flashcards. Flipbooks for such items like Japanese Method of Paddy Cultivation may be prepared showing the different steps involved.

b. In order to cut time and cost of art production, and to produce more effective extension teaching materials, the visual aids section, in consultation with the specialists, should design a kit of basic extension teaching materials, produce them in adequate quantities and supply them to

the Grama sevaks. Each campaign kit should include a key leaflet designed to acquaint the extension worker with the subject matter of the campaign, an illustrated circular letter to acquaint the village leaders with the proposed campaign, a set of flash cards designed as presentation aids for the village level worker, a set of folders to be given to each cultivator who attends the first meeting and a wall newspaper to be posted in the village. Providing such kits for each campaign planned will encourage the consideration of different possibilities in teaching materials. Posters produced in quantity by offset printing should also be supplied to "spearhead" or introduce a campaign or to reinforce it after it has been launched.

28) The visual aids section should prepare and produce wall newspapers in local language with illustrations in different colors, and mail them to each block to be pasted on the walls of buildings at busy intersections in the villages, bulletin boards, in reading rooms, at schools, public buildings and other appropriate places.

29) The responsibility for preparing exhibits needs to be shared jointly with the "craftmen" at the Research Engineers' Workshop in addition to utilization of the existing facilities and the help of the artists. Increasing thought should be given to exhibit items, such as turntables and poster board set-ups using standard visual aids, all of which can be mailed or transported easily.

30) The services of the photographic laboratory should include the photographing, in either black and white or color (if possible) of persons, performances, events and objects both on the campus and in the districts. Other services should include: copying of photographs, illustrations, and other flat copy; making black and white prints or filmstrips or 2" x 2" slides. Increasing thought should be given to including more and better photographs in publications like "Mezhichelvam."

31) In order to speed up intra-staff communication of subject matter from specialist's office to the block level worker, and to provide current subject matter to them so that they can be up-to-date in the needed technical information, consideration needs to be given to the periodic production and use of "fact sheets" which are "boiled down" versions, of subject matter informational documents illustrated with drawings or photographs or both. Fact sheets should be prepared by the Extension Specialist in consultation with the research sections and passed on to the visual aids section for preparation and distribution. Fact sheets should be prepared in the regional language, namely Tamil.

32) The following steps should be considered in the development of a visual training program:

a. Reviewing of literature inorder to discuss questions which may arise

b. Cataloging existing visual materials and equipment used in the organization.

c. Cataloging existing visual materials and equipment used in the organization

d. Preparing examples of multiple-use visuals, keeping workshop problem localized, using homemade materials when possible and distributing pertinent information about sources of supply.

33) The Visual Aids Specialist should divide the entire state into two zones and place each zone under the jurisdiction of one Assistant Visual Aids Specialist, who will tour the entire area and attend to teaching work of the extension workers in the blocks, besides attending other items of work assigned to him by the specialist.

34) It is suggested that the training of extension, teaching and research staff members needs to be accomplished by the following ways:

a. Arranging demonstration of visuals at annual conferences, regional meetings and seminars

b. District schools or workshops

c. Tip sheets

d. Individual conferences

e. Contests

f. Preparing a series of mimeographed "how-to-do-it" booklets showing how to make and use visual aids with good illustrations and distributing them

35) It is also suggested that a standard course in visual aids should be introduced and given to the grama sevaks, who are being trained in the Basic training schools.

36) Similar courses should be given in the training centres for Block Development Officers and in the study camps of Members of Parliment and Members of the State Legislative Assembly, and Council.

37) The University of Madras should be made to recognize the need for pre-service training in use of visual aids for extension workers, and to incorporate such training as a separate course in the curriculum for B. Sc. Agriculture students.

38) The auditorium now under construction in the Agricultural College and Research Institute at Coimbatore should be wired for projection apparatus, provided with a screen for projection on the stage and provision made to darken the room with dark curtains. Evening classes twice in a week may be conducted to teach research and teaching staffs about the use of visuals.

39) It should be the aim of visual aids section to identify some of the research needs within each of the four broad areas of the communication process--the communicator, the message, the channels and the audiences, and consider specific questions to be asked and answered through research studies. Specific questions about the communicator that may merit consideration in research studies are suggested below:

a. What is the relationship between extensive use of visual aids by extension workers and their success as extension teachers?

b. How much time do extension workers, or the staff of a visual aids section, spend in preparing various visual materials?

c. What factors are associated with the size of the visual communication budget?

d. How do extension workers appraise the relative values of the various visual communication methods?

e. Do the extension workers in the block feel qualified to make use of visual communications?

f. What is the relationship between extension workers' qualifications and the visual communications efforts they make?

40) Specific questions about the message that may merit consideration in research studies are suggested below:

a. To what extent can the technical terms be used in visually communicating effectively with a farm audience?

b. What is the relative effectiveness of movies, filmstrips, slides, graphs, charts and illustrations?

c. What are the effects of making the following changes in handling the same bit of information

i. change in organization

ii. change in appeals

iii. change in channels.

d. Which medium is most effective for imparting factual knowledge about people, places, conditions and interrelationships?

e. How much detail can be effectively used in filmstrips, slides, exhibits, posters, charts and other visual materials?

f. Is there a "best" treatment for different specific groups--illiterates, educated, lower class, middle class, upper middle class, upper class and religious groups?

g. Teaching given by which visual aids in remembered longest?

41) Some selected specific questions about the channels that may merit consideration in research studies are suggested below:

a. What criteria can be used to determine the most effective media or combination of media to use in a given situation?

b. What is the comparative cost-effect ratio of visual communication media -- movies, filmstrips, slides, publications, news services, exhibits, posters, graphs and other visuals?

c. How does farmer choice of media differ in situations where few media are available from those in which many media are available?

d. Is there a better way to distribute the monthly magazine "Mezhichelvam" and the Villagers' calendar than the present method?

42) Some selected specific questions about audiences that may merit consideration in research studies are suggested below:

a. Why are some recommended farm practices adopted more quickly by certain audiences than by others?

b. How does socio-economic status in terms of age, sex, religion and grade level affect audience attitude toward channels?

c. What are the effects of intelligence, educational level, previous knowledge and training on learning by exposure to different visual aids?

d. What effect does charging for publications have on distribution and use?

e. What is the level of farm audience comprehension of technical terms?

f. How do specific factors affect credibility of source and channel?

g. What influence does each visual aid have in modifying specific and general opinions?

h. What are the possibilities of modifying motivation and attitudes by the use of films, filmstrips and slides?

i. What influence does each visual aid shown in the village have in bringing about improvements in practices and habits?

43) The research staff, before starting research work, should collect bibliographies and collations of research in the

field of visual education and should prepare summaries of experiments wherever available. Apart from this, they should also keep an up-to-date evaluation file of the educational worth and technical quality of various visual aids.

44) The Visual Aids Section should also develop a printed or mimeographed guide or handbook which should include the description, use and limitations of various visual aids, with suggestions for effective use of materials and equipment according to situations, and also complete instructions to the extension staff for ordering, handling and returning materials and equipment to the visual centre. Copies of the publication should be supplied to all blocks.

45) The Director of Agriculture also needs to prepare a standard of performance for the Visual Aids Specialist and a performance review based on the job description and standard of performance. The performance review should be held annually by the Dean and Additional Director of Agriculture, and needs to cover the past extension year and be made as soon as possible after the beginning of the year. A copy of the completed form should be given to the Visual Aids Specialist at the conclusion of the performance review. A similar procedure should be followed by the Visual Aids Specialist with regard to his subordinates.

46) The Visual aids section should also prepare a list of sources of materials and equipment--local, National and International. The following types of informational sources will be helpful:

a. Standard catalogs

b. List of producers and distributors of films, slides, filmstrips.

c. Government sources

d. Manufacturers of equipment

e. Local sources of material and equipment

f. Leading organizations in visual education

g. Current periodicals and bulletins.

47) The Visual Aids Specialist needs to make a thorough review of the working of the newly created machinery at the end of the first year of working of the section and place the report before the Director of Agriculture, together with suggestions for modifications and improvements. This kind of thorough search will help to fill up the gaps left and enable the functioning of the machinery on a more efficient and useful line.

III. RECOMMENDATIONS FOR FURTHER RESEARCH IN THE UNITED STATES

The following recommendations are suggested for the consideration of those conducting research in agricultural communications in the United States:

1. Conduct studies of the comparative value of the motion picture, filmstrip, slide, exhibit and other visual aids, in promoting personal and social understanding
2. Carry out research to determine which visual techniques of formulating and presenting ideas in the field are most effective for specific situations
3. Conduct studies to find out the best order in which to use visual techniques in specific learning situations
4. Carry out research to determine the relative effectiveness of various visual aids when used with different specific audiences.

All these problems merit intensive study designed and conducted through the cooperative efforts of specialists in each area of communication.

In addition to the major research areas suggested above, there are some specific questions which should be asked and answered through carefully designed and conducted research studies, including:

a. What is the relationship between extensive use of visual aids by extension workers and the success of those workers as extension teachers?
b. What factors are associated with the size of the visual communication budget?
c. How do extension workers appraise the relative values of the various visual communication methods?

d. What is the relationship between extension workers' qualifications and visual communications efforts they make?

e. Is there a "best" treatment for different specific groups, such as illiterates, educated, lower class, middle class, upper middle class, upper class and religious groups?

f. What is the comparative cost-effect ratio of various visual communication media--movies, filmstrips, slides, publications, news services, exhibits, posters, graphs and other visuals?

g. What is the relative effectiveness of visual aids in the actual transfer of knowledge (i.e. how much faster do people learn through use of visuals, like slides, motion pictures, exhibits and demonstrations, than without it) and how much more or less do they retain?

h. How far can the equipment being used at present be simplified without reducing its effectiveness?

i. How can the various visual aids be made to apply to specific audiences, rather than general audiences as it is at present?

j. What factors contribute to making television an effective teaching aid in transmitting agricultural information to farm people as well as urban people?

k. Since the advent of television, and its whole-hearted acceptance by the american people, certain excellent educational motion pictures are practically "going to waste." How best might these films be used?

l. How does socio-economic status in terms of age, sex, religion and grade levels affect audience attitude toward selected visual communication channels?

m. What are the effects of intelligence, educational level, previous knowledge and training on learning by exposure to different visual aids?

n. What are the possibilities of modifying motivation and attitude by the use of films, filmstrips and slides?

o. What are the effective ways by which people can be trained in the use of visual aids, and what is the comparative effectiveness of each individual teaching method used at present?

p. Why are some recommended farm practices adopted more quickly following certain visual presentation than others?

q. How well do people understand the visual techniques used in a motion picture to express passage of time and change of location?

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