GUIDELINES FOR DEVELOPMENT AND USE OF SELECTED TYPES OF AUDIOVISUAL MATERIALS IN HOME ECONOMICS

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CHAPTER I

INTRODUCTION

The combined effects of the knowledge explosion and the population explosion have created communication problems in the classroom. The knowledge explosion has caused traditional methods of classroom communication to become outmoded and inadequate, while the population explosion has created a necessity for discovering more effective methods for teaching large groups yet at the same time meeting individual needs of the students.

Audiovisual instruction is increasingly being incorporated into the classroom in an effort to teach more information in less time and to teach it effectively so that it will be better understood and retained longer. As teachers become more familiar with audiovisual instruction and as more facilities are provided, the newer media will increasingly be used to serve many instructional purposes--not as enrichment devices to be used if time permits, but rather as carefully planned and integrated parts of the teaching-learning environment. (27).

An ever-increasing variety of audiovisual media is available, and teachers need to familiarize themselves with new developments in order to use them constructively in their teaching. Often there is a scarcity of up-to-date equipment in the schools, but even when equipment is provided, possibly through use of federal funds which are available at this time, teachers may not use it unless they feel confident in their

knowledge of audiovisual instruction.

The field of audiovisual instruction is not without research. There have been surveys to discover kinds of equipment owned by a school district or used within a state, studies of whether a particular audiovisual instrument will teach a particular concept, and attempts to discover types of commercial audiovisual materials available in specified fields. Many studies, however, are comparative studies, comparing traditional methods of teaching with newer methods in an attempt to prove the necessity for audiovisual instruction.

Stolurow (46) hopes that in the future the comparative study will not be with us. He believes that "currently in (audiovisual) research there is blind repetition, if not stubborn persistence in the use of the comparative methods of research design." It seems more appropriate to study carefully the various aspects of the complex field to determine their potential contributions to education than to continually compare a new method with a traditional one.

Research is lacking in audiovisual instruction specifically directed toward home economics. This study should help to meet the needs of home economics teachers for up-to-date information on the development and use of audiovisual materials in the teaching-learning process.

Statement of the Problem

The present study, which was developmental in nature, was designed to acquaint home economics teachers with selected types of audiovisual materials and to provide information which would assist the teachers in developing audiovisual materials of their own.

The major problem of the study was to establish guidelines for the

development and use of four types of audiovisual materials in home economics classes based on the needs of a selected group of secondary home economics teachers in Oklahoma.

Objectives of the study were:

To determine types of audiovisual materials and equipment currently being used by selected teachers of home economics in Oklahoma and to locate areas in which assistance is needed and desired.

To set up tentative guidelines for development and use of audiovisual materials and to develop sample audiovisual materials illustrating ideas presented in the guidelines.

To evaluate the tentative guidelines and audiovisual materials used in the study.

To make recommendations for revision of the guidelines and audiovisual materials in accordance with the evaluation of the tentative materials.

Limitations of the Study

The study was limited to four types of audiovisual materials: (1) 35mm slides, (2) overhead transparencies, (3) programed instruction, and (4) 8mm silent motion pictures. These four types of materials were selected because they are appropriate for mass instruction and/or individual instruction, and because the materials may be either purchased commercially or developed by the teacher.

The subject matter areas of home economics in which the sample materials were developed were foods, child care, and clothing because these are the three areas which are common to both homemaking and gainful employment programs in Oklahoma.

The study was limited to the development and use of audiovisual materials in the classroom and did not include specific instructions on how to operate equipment. Since each different piece of equipment has a unique set of instructions, it was believed that operating instructions could be acquired most efficiently by reading the information furnished by the manufacturer of the equipment.

The entire study was conducted during one academic year. This limited the time available for allowing teachers to use and evaluate the materials.

Definitions of Terms

Audiovisual instruction (sometimes written audio-visual or audio visual) includes all types of instruction which utilize materials or devices employing the use of sight and/or sound. Programed instruction is not always included as a part of audiovisual instruction, but it will be included in this study.

Guidelines as used in the study will refer to a sixty-five page handbook developed by the writer containing a collection of basic ideas underlying the development and use of audiovisual materials in home economics.

Slides will refer to 2x2-inch photographic transparencies in cardboard mounts which may be arranged in sequence to show a step-by-step process, or grouped to illustrate a specific concept. These groups or sequences of slides will be referred to as slide sets or as a slide series.

Transparencies will refer to sheets of transparency film, slightly smaller than a sheet of notebook paper, containing an image which may

be projected on a screen from the front of a lighted room by means of an overhead projector.

Programed instruction refers to a type of learning experience wherein a student is led through a carefully planned sequence of material to a desired type of behavior. The materials are designed in such a way that the student responds frequently to stimuli and his responses are immediately reinforced through a knowledge of results. The entire sequence of material is referred to as a program.

8mm motion pictures are short movies made with 8mm film. Super 8 refers to 8mm film which allows space for a larger picture image. Frequently 8mm motion pictures are referred to as continuous loop films, single concept films, or film loops.

Procedure

The following procedure was used in the developmental study. A questionnaire was developed to determine types of audiovisual materials currently being used by home economics teachers, equipment available for their use, and areas in which assistance was needed or desired. The questionnaire was sent to all home economics teachers in Oklahoma who teach gainful employment classes or who cooperate with Oklahoma State University in the student teaching program.

On the basis of the information received in the questionnaire, guidelines were developed to acquaint teachers with techniques in audiovisual instruction involving slides, transparencies, programed instruction, and 8mm motion pictures. The guidelines were organized into six sections; an introduction to audiovisual instruction, a section devoted to each medium, and a section on commercial materials available in the

areas of foods, child care, and clothing.

Early in the fall semester, the guidelines were sent to the sixty-seven teachers who had indicated their desire to participate in the study by returning the questionnaire. Sample materials illustrating the principles stated in the guidelines were developed and sent to teachers who indicated a desire to use them in their classes. Evaluation sheets were included with the samples for teacher evaluation of the materials.

In April, a final questionnaire was sent to the teachers to determine whether the guidelines had been effective in helping them use more audiovisual materials in their classes. The questionnaire gave teachers an opportunity to evaluate the guidelines and the project as a whole. Recommendations were made for revision of the guidelines on the basis of information given on the evaluation sheets.

Organization of the Study

The report of this study is organized into five chapters.

Chapter I has presented the problem, objectives, limitations of the study, definition of terms, procedure, and organization of the study.

In Chapter II a review of the literature relevant to the study is presented.

The results of the questionnaire used to determine needs of teachers and a discussion of the development and use of guidelines and sample audiovisual materials based on those needs are presented in Chapter III.

Chapter IV includes the evaluation of the guidelines and of the project as a whole.

The summary, conclusions, recommendations for revision of the guidelines and sample audiovisual materials, and implications for further study are presented in Chapter V.

CHAPTER II

REVIEW OF RELATED LITERATURE

Communication is a vital factor in the process of education. The teacher can no longer attempt to be the sole communicator of information in the classroom. The knowledge explosion has made it impossible for one teacher to know all the facts about any one field. Many teachers are expected to teach information which is so current that it is not yet in the textbooks. New facts are continually being discovered so that what one learns today may be obsolete tomorrow. This calls for a new type of teaching.

The number of students in school has been continually increasing. This is partly because of the expanding population, resulting in greater numbers of school-age youth, and partly because a larger proportion of the school-age population is attending school--from kindergarten to college. Because of the increase in the number of students without a proportionate increase in the number of teachers available, teachers are having to find methods of teaching large groups of students in a limited amount of time. There is also more diversity in abilities and interests of students, and this creates additional problems.

The technological revolution has greatly influenced the lives of children in the United States. By the time children enter the first grade, they are well-acquainted with movies, radio, and television. For every hour the students are exposed to classroom information and media,

they spend more than four hours under the influence of non-school mass communication media. (51). When teachers attempt to hold the attention of these students with words and books alone, it frequently becomes a lost cause.

According to Wittich (51), the problem is three-fold. First, teachers must acknowledge the explosion of knowledge. Next, this knowledge must be incorporated into the curriculum. Finally, teachers must find and select meaningful ways of communicating all of this to the student. If the holding power of the school is to be strengthened, the attractive attention-getting communiction techniques used outside the schools must be incorporated into the classroom.

History of Audiovisual Instruction

Audiovisual instruction is not new. For longer than there has been teaching in organized schools it has been observed that people learn most readily from actual experiences involving their senses, particularly their senses of sight and hearing. As early as the first years of the seventeenth century such writers as Andrea and Campanella were advising readers of the importance of sensory experience to teaching. Pestalozzi, in the late eighteenth century, advised that experience was the only base of meaning in word symbols. In the early nineteenth century, Friedrich Froebel and Johann Herbart insisted that the child's organized learning be based upon controlled sensory experiences rather than word symbols. (8).

It is difficult to establish a date for the beginning of audiovisual instruction in the United States, but in 1905, St. Louis set up the first audiovisual center connected with the schools. By the early

twenties, about a dozen centers were scattered throughout the country. Today all cities of 100,000 and over have audiovisual centers, and many well-equipped, well-staffed centers can be found in districts as small as twenty thousand. (28).

Research in audiovisual instruction began in the nineteen-twenties, and more than one hundred doctoral dissertations have been completed since 1923. The first educational journal to be devoted exclusively to audiovisual instruction was The Educational Screen, first published in 1922. Today there are more than a half dozen journals in the field. Various organizations have been established for the promotion of audio-visual instruction. The most widely known of these is DAVI, the Department of Audio-Visual Instruction. DAVI, a department of the National Education Association, is a "national professional organization for persons and organizations interested in improving education at all levels and in all subject areas through the use of audio-visual and other instructional materials." (28).

Audiovisual instruction gained impetus during and immediately after World War II. Faced with training large numbers of raw recruits in a short time, the armed forces found audiovisual methods and equipment invaluable. (8). As industry lost trained personnel to the armed forces, new personnel had to be trained quickly. Training directors rapidly adopted techniques of audiovisual instruction and found that these techniques increased the efficiency of workers, provided interest and incentive, resulted in greater comprehension, and improved the quality of workmanship. (28). Even today industry and the armed forces are two of the largest users of audiovisual instruction.

During the immediate postwar period, colleges and universities

showed a growing interest and a steep increase in research in audio-visual instruction. By 1950, the acceptance and general use of audio-visual instruction in education was evidenced by the adaptation of classrooms for use of the materials. Since 1958, the amount of audio-visual equipment and materials used in the schools has been steadily increasing, primarily as a result of Title III of the National Defense Education Act.

During the sixties, the availability of new and novel educational media is mushrooming. Not only are specific devices being invented or improved, but computerized instruction and complete instructional systems are being developed. The task of sorting out the best materials for each teaching purpose becomes increasingly more difficult. (51). The new media make it more important than ever for teachers to know what educational ends they seek. Until these objectives are clearly determined, the means of reaching them cannot be effectively selected.

Audiovisual Instruction Today

During the past thirty years, according to Allen (2), a vast amount of research has accumulated "demonstrating conclusively that audio-visual instructional materials, properly used, can make significant contributions to learning over a wide range of conditions and subject matter content." New media and learning materials can help students accommodate increased amounts of factual learning and sustain greater retention. (51).

If audiovisual instruction is to reach its potential today, it must be adapted to meet two concomitant developments: one, a technology associated with mass instruction; the other, a technology associated

with individual instruction. (40). Some types of audiovisual techniques, such as the overhead system, are particularly suited to mass instruction. With the increasing numbers of students and the shortage of teachers, it seems inevitable that some classes will have to be extra large. In one study, however, teachers found that the fastest learners in a group can learn eight times as much as the slowest. (4). It has been said that there is nothing so unequal as the equal treatment of unequals. Recognition of this principle is essential when designing mass education programs for a complex, progressive society. (35).

Because of the diversity in abilities and interests of the large groups of students, individual instruction has become the concern of many educators. Suppes (40) stated that improvement in learning of subject matter can best be achieved through research concentrated upon individual differences. Newsom (35) supports the idea of individual instruction with the statement,

> . . . each individual must develop for himself, as a result of active involvement in many and diverse experiences, his own laws of adaptation to his environment, his own methods of analysis and utilization of facts, and his own rules and objectives.

As students are given more responsibility for their own education, they should also learn to test themselves in order to diagnose what they have learned or failed to learn. (12). Thus, they can guide themselves in independent study. Fleck (15) states, "Independent study provides an excellent experience for instilling the desire for continuous learning, which is a desirable lifelong value."

"Psychology is providing us with better information about teaching, and technology is providing the tools to capitalize on this new

knowledge." (35). It is only by taking advantage of the very newest instructional materials that adequate experience with the modern world may be provided. (51).

Four types of instructional materials which technology has contributed to education seems to be of particular significance today. These are slides, transparencies, programed instruction, and 8mm motion pictures. With a little training and experience teachers can develop these materials themselves. They can also purchase the materials commercially. These four are well-suited to mass instruction and/or individual instruction. Transparencies used with the overhead projector are particularly useful for mass instruction, while 8mm motion pictures and programed instruction are designed for individual instruction. Slides are not really new to education, but refinements in projectors and film have made them even more useful in the past few years. Slides are appropriate for either mass or individual instruction, depending on the purpose for which they were designed. A discussion of each of these four materials follows.

Slides

As early as 1646, Athanasius Kirchner developed the first projector. Although projectors as they are known today had to await advancements in electricity and photography, his invention paved the way for development of a number of different types of projectors now used for both entertainment and education. The twentieth century has seen refinements and improvements in projection equipment and materials, and, as a result, projected images have become commonplace in classrooms throughout the nation. (14).

One popular form of projection used in classrooms today utilizes slides. When motion is not important, a slide is an effective instructional device. (28). A slide can be projected on the screen for an indefinite period of time without damage. This enables the teacher and class to point out and discuss in detail items appearing on the screen. (7). A survey made by the U. S. Department of Health, Education and Welfare indicated that school districts own 1,286,300 slides, and that 718,800 more are necessary to meet instructional needs. (14).

Slides are one of the most versatile of all projected materials. They have been successfully used with both large and small groups, and they are frequently being used today for individual instruction. Good quality, remotely controllable projectors, and daylight rear-projection screens have increased the effectiveness of slide presentation to large groups. (49). Audio-tutorial carrels with individual slide projectors utilizing trays which eliminate the necessity for student handling of the individual slides have encouraged the use of slides for individual instruction.

The flexibility of slides is one of their principal advantages for teaching. Slide sets may be tailored to fit individual school situations. Slides may be projected in sequence, shown individually, or used in combination with slides from other sets. Slide sets may be revised by simply replacing outdated pictures with newer ones. Locally produced slides are often added to commercial sets to "round out and localize the content of commercially produced slide sets." (5).

Slides may have a public relations function in assisting persons with interpretation of the school to the community. (7). They may also be used to interpret new educational programs to prospective students

and to administrators. Slides may be used to record field trips, class projects, or daily school experiences for use at a later date.

Slides are valuable to the classroom teacher. Excellent commercial sets are available at all levels, and a teacher with a 35mm camera can easily make his own. It is up to the teacher to select and/or produce those slides which can best complement his instruction. (14).

Transparencies

The overhead system is rapidly becoming one of the most widely used teaching techniques in the United States. "A study conducted by the Bureau of Social Science Research showed that in 238 sampled school districts the number of overhead projectors increased 175.5% from 1961 to 1964. This was higher than for any other piece of audiovisual equipment." (54).

Teaching with an overhead projector is not really a new idea. The armed forces have used it since World War II in training military personnel. The earliest projectors, however, were very expensive and were heavy and inconvenient to use. This slowed their acceptance in educational institutions. (44). During the past few years, relatively inexpensive projectors have been developed which are light-weight and may be easily carried from room to room. The projectors are mechanically simple to operate; the teacher controls the material, eliminating the necessity for a projectionist. (14). The overhead projector is used from the front of a lighted classroom. This allows the teacher to face the class at all times and the students have light available for note-taking.

Various equipment and processes for making transparencies have

also been developed and improved during the past decade. According to Wyman (53), the most common method of making transparencies from paper is the thermal copying process. In this process, sometimes called the heat transfer process, a sheet of specially prepared plastic is placed over the material to be copied and exposed to intense radiant heat for a short time. The image is thus transferred to the plastic for projection. This method results in usable transparencies in a few seconds at low cost.

The diazo process is frequently used for production of colored transparencies from transparent or translucent masters. This is a chemical process requiring an intermediate step, but the teacher needs little technical knowledge to prepare effective color transparencies by this process. (5).

A number of photographic machines and processes are available for making copies from books or from continuous tone images, but the equipment is more expensive and more difficult to operate. Colored materials may be copied by this process, but the copies are always black and white. (53).

Full-color transparencies can be prepared from most pictures in popular magazines by the color-lift process. This is a method of actually transferring the ink from a sheet of clay-coated paper to a sheet of transparency film. This process results in a full-color transparency not possible otherwise except through full-color photography. (53).

Transparencies may also be hand made by using a grease pencil or nylon-tipped pen to draw on a sheet of clear acetate or reprocessed x-ray film. (45). Color may be added by using color-adhesive film or by coloring spaces with nylon-tipped pens. This is an inexpensive method

of producing transparencies tailored to the local situation.

The overhead system has many uses in the classroom. It is favorably competing with the chalkboard. According to Cross and Cypher (8), "virtually any instructional purpose for which a chalkboard has been used may be served more efficiently by the use of overhead transparencies." Complicated outlines or drawings may be prepared ahead of time and filed away for later use, while new material may be worked out on the transparency in full view of the students. A prepared outline may be permanently drawn on the transparency and the details filled in as students watch.

Small objects or opaque cut-outs placed on the stage of the projector will cast a silhouette on the screen. Transparent objects, such as plastic rulers, may be projected on the screen. (38). Simulated motion and flow-action may be produced on the overhead through polarization. A few years ago, this was a complex process, but it is now a relatively simple matter to make a word "pulsate," a liquid flow through a pipe, or a heart pump life-giving blood. (45).

A number of studies indicate that use of the overhead system saves teacher time. (14). The results of an extensive experiment at the University of Texas showed a saving of fifteen minutes of every sixty-minute lecture period when transparencies were used. (5). The versatility and convenience of the overhead system, and the ease with which transparencies may be prepared, have made it a favorite with teachers.

8mm Motion Pictures

One of the most recent innovations in education is 8mm motion pictures. For more than a half-century, pictorial media have had an

established place in the American classroom, but the motion pictures previously used have been on 16mm film. (37). The major objective for using 16mm motion pictures has been to bring the "world of experience" into the classroom and to offer large groups of children "vicarious experiences via the movie screen." (50). These 16mm motion pictures are excellent for presenting ideas for which portrayal of motion is essential, but they must be used in a dark room with a projector which many teachers find difficult to operate.

According to Forsdale (20),

> The great contribution of 8mm film is that it can change the motion picture from the most difficult to among the simplest of all pictorial media to use. Other means of accomplishing this have been suggested, e.g., videotape, but 8mm is the only presently available vehicle--cheap enough, good enough, and simple enough--to make the motion picture accessible to the average teacher in the average school.

One of the biggest advantages of 8mm motion pictures is that the film may be housed in plastic cartridges. This allows the projector to be loaded simply by inserting the cartridge. The cartridge also makes the film easy to store and protects it from dirt and damage. The strip of film is continuous, eliminating the necessity for threading a projector or rewinding the film. Sometimes these cartridge films are called film loops. They may be called single concept films because each film usually ranges from thirty seconds to four minutes in length and presents only one concept. (5).

The most significant factor in the increased utilization of 8mm motion pictures is the shift from large group presentation to individual or very small group presentation. (50). Rear-view projection lends itself to individual viewing in a small area, such as a carrel in a library, classroom, or audio-tutorial laboratory. A self-contained

rear-view projector looks something like a television set, and darkening of the room is not required for use. (18). Teachers and students find 8mm motion pictures easy to produce. The only equipment necessary is a motion picture camera, and the cost of 8mm film and equipment is significantly lower than the equivalent in 16mm motion pictures.

The compelling visual power of motion pictures allows them to do many jobs effectively. A film loop may show a manipulative skill that is difficult to communicate in words. (49). Documentary film records of class activities and achievements may be made by students or teachers for future reference by parents, teachers, students, and administrators. (51). Some projectors allow the image to be held in one position as long as desired for the study of detail. The film can be repeated as many times as necessary for the student to fix the points in his mind.

The first 8mm motion pictures produced commercially were silent, but both magnetic and optical sound are now being added. (50). More than sixty film producers throughout the world are now engaged in production of 8mm films, and more than 3,000 are now available in a wide range of subjects. (51). Nearly 750,000 8mm film projectors are sold annually in the United States, and well over five million are now in use. The number of 8mm projectors sold annually is greater than the total number of 16mm projectors in use in the United States. (5).

The 8mm development in education has the signs of a major development. Forsdale's (20) guess is

> . . . that it will help revolutionize the uses of the moving pictures in education--changing every aspect of the process, from the kinds of films which are made to the manner in which they are acquired and used. If this guess is an accurate one--and time alone will tell--then we are dealing with one of the

most important developments in the history of educational communication.

At any rate, "8mm film has inherent characteristics that . . . make it possible for it to become a prime tool of educational instruction rather than a supplementary aid." (37).

Programed Instruction

Programed instruction has been viewed with fear, anxiety, anticipation, and perhaps even awe in its brief history in education. Some prophesied that programed instruction would create an educational Utopia while others argued that classrooms would become robots with no "human" quality whatsoever. Today educators are beginning to pull away from these extremes and to recognize programed instruction for what it is--a method of teaching which, like other methods, has advantages, disadvantages, and specific uses.

Programed instruction originated in the laboratory of the experimental psychologist. In 1924, Dr. Sidney L. Pressey invented a small testing machine which would score a multiple choice examination automatically at the time the answer button was pushed. Pressey perceived that by making a slight change in the machine it could be used as a teaching device to remove some of the routine drill of teaching. With this thought in mind, Pressey developed the first teaching machine. (23). The idea used in this machine was expanded until today programed instruction is available in many forms--from the very simplest mimeographed booklet to the most complex electronic wonders imaginable, utilizing slides, motion pictures, tape recorders, talking typewriters, and various types of computers.

The effect of using programed instruction is like that of having a private tutor. An objective is specified, stated in behavioral terms, and a program is designed to produce the specified change in student behavior. There is a constant exchange between program and student. The program insists that a student understand a point before he is given the next point, yet each student can move through the program at his own rate. The program does not "get tired" repeating the same information over and over to a slow learner, as a tutor might.

Two major styles of programing are recognized today--linear and intrinsic. "The objective of both schools of programing is to produce materials that permit efficient individual study by a student independent of an organized study group and without the continuous intercession of a live instructor." (9). Linear programing, however, capitalizes on a particular theory, while intrinsic programing capitalizes on a particular technique.

The linear, or Skinnerian, program is a single-path sequence in which all students read and respond to the same material. The theory behind it postulates that a desired change in behavior, defined as learning, can best be brought about by inducing and then rewarding the desired behavior in much the same manner as a dog is trained. The format for the linear type program is simple. A very small bit of new material is presented, and the student is required to make a response. He then compares his response to the correct response by turning a page or sliding down a mask. If his response was correct, he feels rewarded, and thus he learns. Linear programs are designed so that students make very few errors, because by linear theory, errors are irrelevant to the learning process. (9).

The intrinsic, or Crowderian, program is composed of several paths or branches; hence the programs developed according to this technique are commonly known as branching programs. The material a particular student reads is determined by his pattern of responses. Students who make errors are exposed to more material than those who always respond correctly. The technique is based on the idea that a student's answer to a multiple choice question can be used to direct him to new material for which he is ready or to a more detailed explanation of the material he has just covered if he has misunderstood it. This type programing is frequently presented in the form of the scrambled book. Each page presents a short discussion of the material to be learned, followed by a multiple-choice question designed to test the point just made. Each answer alternative has a page number beside it. The student chooses an answer and turns to the page number given for that answer. The pages are randomly arranged so that the student cannot ignore the question and simply go to the "next page" of instruction. (9).

At the present time there is insufficient evidence to establish that one type of program is definitely better than the other for a particular type of teaching; however, "it appears that the linear form might be more efficient for teaching rote material such as terminology, and branching programs better for teaching discrimination or problem-solving." (25). Some recent programers are successfully attempting a combination of the two styles, and others are developing a unique style of their own. (32).

Industry and the armed forces are increasingly using programed instruction materials for many different types of training "because of its ability to provide individual instruction, to produce better results in

less time, and at the same time to bring about a savings in the total cost of instruction." (25).

Educators are also recognizing the potential contribution of programed instruction to the teaching-learning process as evidenced by Lumsdaine's (29) statements:

> By allowing individuals to proceed at their own rate through a program of materials, these devices permit students to proceed as rapidly as their abilities permit. The obvious economy of really doing something about individual differences in education (other than merely measuring them) has, in itself, potentially revolutionary significance, not only for the efficiency of instruction, but for the organization of classes and schools . . . . In the opinion of the writer, auto-instructional methods may represent the most important innovation in education since the advent of the textbook.

Programed instruction is making a substantial contribution to our knowledge of teaching processes by applying knowledge of verbal learning. According to DeCecco (13), "This knowledge about teaching may very well be the major contribution of programed instruction." Undertaking a project in programed instruction may benefit a teacher by impressing upon him the need to specify instructional objectives, improving comprehension of the subject matter he teaches, and clarifying the relationship between teaching and testing. It is evident that programed instruction has been and will continue to be in the main current of research on teaching.

Barriers to Effective Audiovisual Instruction

Teachers sometimes hesitate to use the newer media because of a natural resistance to change, a lack of understanding, and/or a lack of preparation. Some teachers fear that they may be crowded out--replaced by machines or reduced to clerical functions. Audiovisual materials, however, are not substitutes for teachers. Wittich (51) stated:

> . . . teachers will always be essential in good educational programs--not only to create ideas for putting to imaginative use instructional materials, but also to do the human, creative and artistic part of teaching which makes a major difference both in how well students learn and more important, in how well they develop as individuals and as responsible members of the society.

"The application of modern tools of instruction can magnify the capabilities of an outstanding teacher and multiply his effectiveness. They extend his inspiration, talents, and expertness to even larger numbers of students." (6).

The hesitancy of teachers to use new methods may be attributed to their feelings of inadequacy and insecurity when new techniques are introduced without sufficient teacher preparation. (52). Feelings of insecurity are probably engendered by the threat of job displacement or by lack of knowledge of how the teacher should respond to and use the new techniques. Findings by the National Education Association reveal that sixty per cent of the teachers feel that their preparation in the utilization of audiovisual techniques in the classroom was not adequate. (51).

The key to the solution of the problem rests upon teacher-training and preparation. (4). Some states now have legislation requiring training in audiovisual instruction by all students preparing to teach. Other states have voluntary audiovisual programs for student teachers. Older teachers and teachers in states where audiovisual instruction is not a part of their undergraduate training may need in-service training in the techniques of audiovisual instruction in order to be in a position to utilize the new media effectively.

Summary

The knowledge explosion, the population explosion, and the technological revolution have created a demand for audiovisual instruction in the classroom. The idea of utilizing the senses of sight and hearing for more effective learning was suggested even before schools were organized.

Audiovisual instruction in the United States can be traced back to the early twentieth century, but the movement gained impetus during and immediately after World War II. Industry and the armed forces have found audiovisual instruction very effective in training large numbers of people in short periods of time.

The sixties are seeing notable advancements in the types and amounts of audiovisual materials available. Teachers must become vitally aware of the educational ends they seek before they can efficiently select the means of reaching them.

Two concomitant developments, mass instruction and individual instruction, are influencing education today. Four types of audiovisual materials which may be adapted to these developments are slides, transparencies, programed instruction, and 8mm motion pictures. Teachers may either produce these materials themselves or purchase them commercially.

Although slides are not really new, technology has produced refined equipment which allows them to be used effectively for both mass and individual instruction.

Transparencies used with the overhead projector are rapidly gaining acceptance for use in mass instruction because of their simplicity, convenience, and versatility.

As a result of developments in 8mm film, the motion picture is changing from the most difficult to one of the simplest of all pictorial media to use, particularly for individual instruction.

Programed instruction provides materials which permit efficient individual study by a student without the assistance of a live instructor. The two styles of programing, linear and intrinsic, as well as recent attempts at combinations of the two, have proved to be effective in helping students meet specified objectives.

Teachers are sometimes reluctant to use audiovisual instruction because of a natural resistance to change, a lack of understanding, and/or a lack of preparation. Audiovisual materials are not designed to replace the teacher, but rather to make his teaching more effective. The problem may be partially solved through adequate teacher-training in techniques of audiovisual instruction.

CHAPTER III

DEVELOPMENT AND USE OF MATERIALS

The major problem of the study was to establish guidelines for the development and use of four types of audiovisual materials based on the needs of a selected group of home economics teachers in Oklahoma. Results of a questionnaire used to determine needs of selected Oklahoma home economics teachers and a discussion of the development and use of the guidelines and sample materials based upon those needs are presented in Chapter III.

Questionnaire

The first step in the development of the audiovisual guidelines and materials was to determine the needs of home economics teachers. A questionnaire was developed to determine (1) types of audiovisual materials presently being used, (2) equipment available for use by the teachers, and (3) areas in which the teachers believed they needed assistance. The questionnaire was sent to a total of seventy-eight home economics teachers in the state who either (1) taught one or more classes in gainful employment, or (2) participated in the teacher-training program at Oklahoma State University. A letter accompanying the questionnaire explained the nature of the study and invited the teachers to participate by furnishing information about audiovisual instruction in their home economics classes and by trying out the

guidelines and sample materials developed by the writer as a part of the study. Sixty-seven (86%) teachers returned the questionnaire indicating a desire to participate in the study.

The questionnaire consisted of three parts. Part I requested information about audiovisual materials presently being used by the teachers. Part II dealt with audiovisual equipment available to the home economics teachers, and Part III attempted to discover areas in which teachers felt they needed assistance in the development and use of audiovisual materials. A copy of the questionnaire may be found in Appendix A, page 82.

Results of Part I of the questionnaire, presented in Table I, indicated that more teachers had used transparencies than any of the other types of audiovisual materials. Almost three-fourths of those responding had used transparencies. Slightly over half of the teachers had used slides, and just under one-third had used programed instruction. Only about one-sixth of the teachers had used 8mm motion pictures.

Some of the teachers had developed audiovisual materials of their own. A much larger proportion of the teachers had developed transparencies than any of the other materials. More than half (60%) had developed transparencies and one-eighth had developed slides. Very few had developed programed instruction materials, and only two had developed 8mm motion pictures.

About half of the teachers had used commercially prepared transparencies and slides. One-fourth had used commercial programed instruction materials, and about one-eighth had used commerical 8mm motion pictures. A comparison of these percentages with the percentages of teacher-developed materials shows that teachers used more teacher-made

transparencies than commerical transparencies, but that they used more commercial slides, programed instruction, and 8mm motion pictures than they produced themselves.

TABLE I

RESPONSES OF SIXTY-SEVEN OKLAHOMA HOME ECONOMICS TEACHERS TO AUDIOVISUAL QUESTIONNAIRE - PART I - MATERIALS PRESENTLY BEING USED

Materials	N	%
Which of the following have you used with your classes?		
(a) transparencies	48	72
(b) slides	37	55
(c) programed instruction	21	31
(d) 8mm motion pictures	12	18
Which of the following materials have you prepared for use in your classes?		
(a) transparencies	40	60
(b) slides	8	12
(c) programed instruction	5	7
(d) 8mm motion pictures	2	3
Which of the following commercially prepared materials have you used?		
(a) transparencies	35	52
(b) slides	33	49
(c) programed instruction	17	25
(d) 8mm motion pictures	10	15
For what purposes do you use audiovisual materials?		
(a) motivation	63	94
(b) provide large group instruction	52	78
(c) evaluation	29	43
(d) provide individual instruction	18	27
(e) other	12	18

Motivation was checked by the greatest number of teachers as a purpose for using audiovisual instruction. All but four of the teachers checked motivation. Three-fourths used audiovisual materials for large group instruction, while only one-fourth used them for individual instruction. Almost half of the teachers used audiovisual materials for evaluation. Other purposes listed were (1) for small group instruction, (2) for emphasis, (3) to save lecture and reading time, and (4) to provide specific information not found in textbooks.

The results of the section of the questionnaire dealing with audiovisual equipment are presented in Table II. All of the teachers had access to one or more projectors. The overhead projector was the most common with all but three of the teachers having access to one. Very few teachers had cameras available for their use. Eleven had slide cameras, while only three had 8mm motion picture cameras, and none had super 8 motion picture cameras.

The most common type of duplicating equipment for transparencies was the heat transfer copier with two-thirds of the teachers having access to this equipment. A photo-reflex copier was available to one-third of the teachers, but diazo equipment was available to only five.

More teachers had programed textbooks than teaching machines, but only about one-third had programed instruction equipment of any kind. Fifteen had programed textbooks, four had electric teaching machines, and only one had manual teaching machines. Two of the teachers indicated that they had used programed instruction pamphlets.

Areas in which teachers wanted assistance may be seen in Table III. Almost three-fourths of them requested assistance in making transparencies to use with the overhead projector. Almost two-thirds wanted

TABLE II

RESPONSES OF SIXTY-SEVEN OKLAHOMA HOME ECONOMICS TEACHERS TO AUDIOVISUAL QUESTIONNAIRE - PART II - EQUIPMENT AVAILABLE FOR USE

Equipment	N	%
Projectors:		
(a) overhead projector	64	96
(b) slide projector	50	75
(c) 8mm motion picture projector	14	21
(d) super 8 motion picture projector	5	7
Cameras:		
(a) slide camera	11	16
(b) 8mm motion picture camera	3	4
(c) super 8 motion picture camera	0	0
Duplicating equipment for transparencies:		
(a) heat transfer copier	44	66
(b) photo-reflex copier	22	33
(c) diazo copier	5	7
(d) other	0	0
Programed instruction equipment:		
(a) programed textbooks	15	22
(b) electric teaching machines	4	6
(c) manual teaching machines	1	1
(d) other	2	3

assistance in developing short programed instruction materials and compiling information on where to find and how to order commercially prepared audiovisual materials. Slightly over half of the teachers felt they needed assistance in determining which medium would be most effective for teaching a particular concept. Half of the teachers wanted help in selecting commercially prepared audiovisual materials, and slightly less than half requested assistance in preparing the class for learning through audiovisual instruction. Forty-two per cent wanted help in evaluating the effectiveness of audiovisual materials. About one-fourth wanted assistance in developing slide sets, and about one-sixth requested assistance in developing 8mm motion pictures. Four of the teachers listed other areas which were beyond the scope of this study, such as how to secure equipment, up-to-date information about 16mm films, specific information about teaching machines, and storage of audiovisual equipment.

The teachers were asked to list concepts, skills, or other information which might be more effectively taught through audiovisual instruction. Much of the information listed was too broad to be of value in developing a specific set of materials, but the areas of clothing construction, food preparation, and child development were mentioned very frequently. Some of the more specific items listed were (1) developmental tasks of children, (2) playschool equipment, (3) zipper application, (4) buttons and buttonholes, (5) table settings and table service, (6) abbreviations, (7) time and motion studies, and (8) safety and sanitation.

The large percentage of questionnaires returned seemed to indicate a strong interest in audiovisual instruction among the teachers in the

study. All of the teachers had some audiovisual equipment available for their use, but not all teachers who had the equipment were using it. For example, the overhead projector was available to all but three teachers, yet less than three-fourths of the teachers indicated that they had used transparencies with the overhead projector in their classes. Although three-fourths of the teachers had access to a slide projector, only about half of them had used slides. An 8mm projector or a super 8 projector was available to about one-fourth of the teachers, but only about one-sixth had used 8mm motion pictures.

TABLE III

RESPONSES OF SIXTY-SEVEN OKLAHOMA HOME ECONOMICS TEACHERS TO AUDIOVISUAL QUESTIONNAIRE - PART III - AREAS IN WHICH ASSISTANCE IS NEEDED

Area	N	%
Making transparencies to use with overhead projector	47	70
Developing short programed instruction materials	41	61
Compiling information on where to find and how to order commercially prepared audiovisual materials	41	61
Determining which medium would be most effective for teaching a particular concept	38	57
Selecting commercially prepared audiovisual materials	34	51
Preparing the class for learning through audiovisual instruction	31	46
Evaluating the effectiveness of audiovisual materials	28	42
Developing slide sets	15	22
Developing 8mm motion pictures	11	16
Others	4	6

Most of the teachers used audiovisual instruction primarily for motivation. Audiovisual materials were used much more frequently for large group instruction than for individual instruction. Slightly under half of the teachers used audiovisual materials for evaluation. The large percentages of teachers checking areas in which assistance was desired would seem to indicate a recognition of the need for audiovisual training for home economics teachers.

Guidelines

After examination of the results of the questionnaire, a set of guidelines was developed for teachers to use as a handbook in developing and using audiovisual materials in their classes. The guidelines consisted of six sections: (1) introduction, (2) slides, (3) overhead transparencies, (4) programed instruction, (5) 8mm motion pictures, and (6) commercially prepared materials. A copy of the guidelines may be found in Appendix C, page 95.

The purpose of the introduction was to give teachers an overview of audiovisual instruction and to bring them up-to-date on new developments in the field. This section also presented factors for teachers to consider in deciding whether to develop materials of their own or to purchase commercial materials. Suggestions were given for determining the suitability of a particular material for a particular use. General guidelines were given for using audiovisual instruction in home economics classes, and a brief description of the organization of the remaining five sections was presented.

Sections two through five were each organized into three parts: (1) introduction or overview, (2) use of the media in teaching home

economics, and (3) development or preparation of materials. Because of the uniqueness of each medium, each section differs from the others, but the information presented in each was designed to (1) acquaint the teachers with the medium of instruction, (2) present suggestions for using the medium in home economics classes, and (3) provide enough information for the teacher to be able to develop materials of her own.

The section on commercially prepared materials contained an introduction designed to point out some of the factors to consider in using commercially prepared materials. The remainder of the section listed titles of commercial slides, transparencies, programed instruction materials, and 8mm motion pictures in the areas of child care, clothing, and foods. Names and addresses of producers were also listed. The list was based on information obtained from catalogs available in the Oklahoma State University library, February 1, 1968, and from catalogs received directly from producers prior to that date.

The guidelines were sent to the sixty-seven teachers who had returned their questionnaires during the fall semester, 1967-68, indicating a desire to participate in the project. A title page and a table of contents completed the guidelines, so that if the teachers desired, they could assemble the materials into a handbook for future reference. In April, 1968, a final questionnaire was sent to the teachers for evaluation of the guidelines. Results of the evaluation are presented in Chapter IV.

Slides

Two sample slide sets, "Zipper Application" and "Outdoor Play Equipment," were developed utilizing ideas presented in the guidelines.

The slide series on zipper application was developed to illustrate one method of inserting a zipper in a center back seam. The method selected consisted of attaching the facing to the neckline before inserting the zipper. This particular method of application was selected because it is reasonably simple to execute and it results in an extremely neat, flat back opening. The method is sometimes difficult to explain to students, however, when only written and spoken words are used.

A dress featuring a back zipper was constructed, and several slides were made of each step in the process of applying the zipper. Each step was photographed from several different angles and with different lens openings to vary the lighting of the slide. Several shots were made of the finished garment. A description of each of the slides used in the series may be seen in Appendix C, page 93.

"Outdoor Play Equipment" illustrates various pieces of equipment frequently found on playgrounds at child care centers. Title slides are incorporated at intervals to point out the different types of equipment. The script presents a description of each piece of equipment and provides information about the uses for the equipment. A description of each slide in this set is given in Appendix C, page 94.

The contrast between the two sets of slides is obvious. One illustrates a step-by-step process while the other presents independent bits of information. One set may be used in place of a demonstration while the other enables students to have an experience which would othewise be available only through an extensive field trip. One set was photographed entirely indoors using artificial light while the other was photographed outdoors in daylight. One set consists primarily of close-up shots while the other utilizes mostly long range shots.

A letter describing the slide sets was sent to the sixty-seven teachers participating in the study. They were asked to indicate first and second choice of dates if they wished to use either or both of the slide sets with their classes. Thirty-six requests were received, but because of difficulty in scheduling and various spring holidays in the high schools, only twenty-four teachers used and evaluated the slides. A copy of the evaluation sheet used may be seen in Appendix B, page 88. Results of the evaluation follow.

Fourteen teachers used "Outdoor Play Equipment" and ten used "Zipper Application." Table IV presents the opinion of the teachers regarding the appropriate grade level for use of the slide sets. Three-fourths of the teachers using "Outdoor Play Equipment" believed the set was appropriate for tenth grade students. Two-thirds believed the set was appropriate at the eleventh grade level, and slightly more than half believed it was appropriate for twelfth grade students. Three teachers believed it could be used in eighth and ninth grades, but one teacher who used it with ninth grade students was unable to determine whether students benefited from viewing the slides.

The slides on zipper application were also rated more appropriate for tenth, eleventh, and twelfth grade level, with four teachers believing they were also appropriate at eighth and ninth grade levels. Most of the teachers believed the slides were appropriate at more than one grade level. This would seem to indicate that the slides could be used for different purposes at the different levels. At the lower levels the slides might be used for presentation of the material for the first time, while at the upper levels they might be used for review and/or evaluation.

TABLE IV

OPINIONS OF TEACHERS USING SLIDE SETS REGARDING APPROPRIATE GRADE LEVEL OR LEVELS

Slide Set	Grade Level 8		9		10		11		12	
	N	%	N	%	N	%	N	%	N	%
Outdoor Play Equipment (N=14)	1	7	2	14	11	79	9	64	8	57
Zipper Application (N=10)	1	10	3	30	6	60	4	40	4	40

Note: Percentages do not total to 100% because many teachers believed the sets were appropriate for more than one grade level.

Table V presents opinions of the teachers regarding the number of slides in the sets. "Outdoor Play Equipment" consisted of thirty-six slides and "Zipper Application" consisted of thirty-three. Most of the teachers were satisfied with the number of slides in the sets, indicating that the sets were long enough to tell the story but not so long that they were boring.

TABLE V

REACTIONS OF TWENTY-FOUR TEACHERS TO NUMBER OF SLIDES IN THE TWO SETS

Slide Set	More		Fewer		The Same Number	
	N	%	N	%	N	%
Outdoor Play Equipment	1	7	0	0	13	93
Zipper Application	2	20	1	10	7	70

One teacher stated that she would like more slides in the "Outdoor Play Equipment" set, but did not indicate whether she wanted a greater variety of equipment or more examples of each type of equipment in the set. Two teachers wanted more slides in the "Zipper Application" set, but one teacher preferred fewer. This may serve as a reminder that there are always some students who need more explanation than others.

If the slide sets were used individually in a specially designed machine and "programed" using the branching technique, a large number of slides could be stored in the machine and each student could view

only as many as he needed to understand the point. When slides are designed for use with a large class, however, the set will probably have to be aimed at the so-called "average" student.

Responses of teachers to several general questions about the slide sets may be seen in Table VI. All of the teachers believed the information presented in the slide sets was accurate and correct. All but one of the teachers felt that the individual slides showed clearly what they were supposed to. One teacher felt some of the slides in the "Zipper Application" set were too dark to show the stitches. Stitches would show up better if thread of a contrasting color were used; but since matching thread must be used in the actual construction of a dress, it is usually confusing to students when contrasting thread is used in a demonstration. Perhaps a lighter colored fabric could have been used for the dress in the set.

Seven-eighths of the teachers believed their students benefited from viewing the slides. Several teachers stated that the slides stimulated interest and promoted "thinking." One teacher believed the slides enabled the students to see that zipper application is "simply one step after another." Teachers using the "Outdoor Play Equipment" set indicated that the slides afforded students the opportunity of viewing equipment which was unavailable in the vicinity of their school and suggested ideas for making inexpensive playground equipment.

The one teacher who said students did not benefit from viewing the slides stated that "students were confused," but gave no specific explanation of why or how they were confused. This was the same teacher who believed the slides were too dark for the stitches to be seen. There may have been a lighting problem in the classroom which would

have prevented the image from showing up clearly on the screen. When close-up slides are used to show minute detail (such as stitches) to an entire class, the room must be quite dark. Two other teachers were undecided about whether or not students benefited from viewing the slides. Some kind of evaluation device might be designed to accompany the slides which would assist the teacher in determining whether students learned from the slides.

TABLE VI

RESPONSES OF TWENTY-FOUR TEACHERS TO GENERAL QUESTIONS REGARDING SLIDE SETS

Question	Yes		No		Undecided	
	N	%	N	%	N	%
Is the information correct and accurate?	24	100	0	0	0	0
Did the slides clearly show what they were supposed to?	23	96	1	4	0	0
Did students benefit from viewing the slides?	21	88	1	4	2	8
Would you like to own these or similar slides?	19	79	3	13	2	8
Do you plan to use slides in future teaching?	18	75	3	13	3	13

Approximately three-fourths of the teachers would like to own slide sets so they could be referred to by individual students whenever necessary. Three teachers did not wish to own slide sets, and two were

undecided. Many teachers have to check out projectors from a central location, and with this arrangement it may not be practical for students to use slides individually. As the trend toward individual instruction becomes more widespread, facilities for use by individual students may be incorporated into many of these classrooms.

Three-fourths of the teachers plan to use slides in their future teaching. One-eighth do not plan to use slides again, and one-eighth are undecided. Those who do expect to use slides again plan to use them for: (1) motivating students in high school and adult classes, (2) simplifying presentation of construction processes, (3) clarifying points made in lecture and discussion, and (4) affording experiences which are unavailable to students in certain localities.

Methods by which teachers prefer to obtain slides may be seen in Table VII. Slightly more than half of the teachers would like to borrow slide sets from a central location such as a university audiovisual center. About one-third expressed a desire to develop slide sets of their own, and slightly more than one-third preferred to purchase commercial slide sets. Some teachers checked more than one method, indicating that they would like to obtain slide sets in more than one way.

Comments of teachers indicated that they appreciated having the opportunity of using the slides, that the two sets were quite adequate for the purpose for which they were designed, and that the project inspired them to find uses for slides in teaching their home economics classes.

TABLE VII

RESPONSES OF TWENTY-FOUR TEACHERS REGARDING PREFERRED METHOD OF OBTAINING SLIDES

Method	N	%
To develop your own sets	8	33
To buy commerical sets	9	38
To borrow from a central location	14	58

Note: Percentages total more than 100% because some teachers preferred to use some of each.

Transparencies

A set of transparencies was developed in each subject matter area included in the study. One of the sets, "Kitchen Safety," was hand made using original ideas. Stick figure drawings were made with nylon-tipped pens and colored with adhesive-backed color film. The introductory transparency featured a picture of a kitchen which had been taken from a magazine by the color-lift process with the caption, "Kitchen Safety." The following safety rules were portrayed on the transparencies:

1. Put out grease fires with lid.
2. Always close cabinet doors.
3. Use sturdy step stool to reach high shelves.
4. Clean up spills immediately.
5. Learn to use fire extinguisher and first aid kit.

The other two sets were made from commercial printed masters by the heat transfer process. The set developed for the area of clothing consisted of four transparencies showing steps in sewing on buttons,

hooks and eyes, and snaps. The transparencies were black line drawings on clear film.

The child care set consisted of eight transparencies showing types of toys according to their function. The following types were featured; (1) large-muscle, (2) small-muscle, (3) creative, (4) sensory, (5) role-playing, (6) initiative, and (7) educational. Since the emphasis was on the toys, each of the toys in the visuals was colored with adhesive-backed color film.

Idea sheets were developed to accompany each set of transparencies. The idea sheet gave an explanation of the concepts portrayed on the visuals and suggestions for ways the transparencies could be used by the teacher.

A letter was sent to all participants in the study describing the three sets of transparencies. A form was furnished for those teachers wishing to use one or more of the sets to indicate their first and second preference of dates on which to use the transparencies. Twenty-three requests for transparencies were received. Due to the difficulty in scheduling during the limited time available, only nineteen teachers were able to use and evaluate the transparencies. A copy of the evaluation sheet may be found in Appendix B, page 89. Results of the evaluation follow.

"Kitchen Safety" was used by five teachers, "Sewing on Buttons" by four, and "Kinds of Toys" by ten teachers. The grade levels for which the teachers believed the transparencies to be appropriate may be seen in Table VIII. Most of the teachers believed the transparencies were appropriate for more than one grade level. "Kitchen Safety" received an equal rating for grades eight through twelve. "Sewing on

TABLE VIII

OPINIONS OF TEACHERS USING TRANSPARENCIES REGARDING APPROPRIATE GRADE LEVEL OR LEVELS

Transparencies	Grade Level 8		9		10		11		12	
	N	%	N	%	N	%	N	%	N	%
Kitchen Safety (N=5)	3	60	3	60	3	60	3	60	3	60
Sewing on Buttons (N=4)	3	75	3	75	2	50	0	0	0	0
Kinds of Toys (N=10)	1	10	8	80	10	100	3	30	3	30

Note: Percentages total more than 100% because many teachers believed the transparencies were appropriate for more than one grade level.

Buttons" was rated appropriate for the eighth, ninth, and tenth grades. All of the teachers believed that "Kinds of Toys" was appropriate for the tenth grade, and all but two believed it was also appropriate for the ninth grade. One teacher felt it was appropriate for the eighth grade, and three felt it was appropriate for the eleventh and twelfth grades. In the upper grades, the transparencies were used primarily for the purpose of review.

All of the teachers believed the information on the transparencies was correct and accurate and that the transparencies contributed to more effective learning (Table IX). One teacher stated that the transparencies helped students form meaningful generalizations, and three teachers felt that learning was more effective because the sense of sight was utilized in addition to the sense of hearing.

TABLE IX

RESPONSES OF NINETEEN TEACHERS TO GENERAL QUESTIONS REGARDING TRANSPARENCIES

Question	Yes		No	
	N	%	N	%
Is the information correct and accurate?	19	100	0	0
Do you believe the transparencies contributed to more effective learning?	19	100	0	0

Table X presents the preferences of teachers in regard to the method of obtaining transparencies. If cost were no object, three-fourths

of the teachers would prefer to purchase commercial color transparencies, while only one-fourth would prefer to make their own, either by hand or from purchased masters. When cost was considered, slightly over half preferred both methods of making their own, while only about one-tenth favored purchasing commercial color transparencies. One teacher stated that although she would prefer the commercial ones, she knew that she would be using hand made transparencies because of the cost of commercial materials.

Teachers listed the following as important contributions which the use of transparencies can make to the teaching of home economics: (1) supplement the textbooks, (2) create interest, motivate students, and inspire discussion, (3) add emphasis to a lecture or discussion, (4) clarify procedures in a demonstration, and (5) provide a quick review.

TABLE X

RESPONSES OF NINETEEN TEACHERS REGARDING PREFERRED METHOD OF OBTAINING TRANSPARENCIES

Method	N	%
If cost were no object:		
(a) Hand-make your own	4	21
(b) Make from purchased masters	4	21
(c) Purchase commercial transparencies	14	74
Considering cost of the method:		
(a) Hand-make your own	10	53
(b) Make from purchased masters	11	58
(c) Purchase commercial transparencies	2	11

Note: Percentages total more than 100% because several teachers preferred to use two different methods of obtaining transparencies.

In general, the comments made about the transparencies were favorable. Some teachers stated that the ideas presented by the transparencies inspired them to use adaptations in creating transparencies of their own. One teacher who teaches out-of-school youth, including some who do not speak English fluently, felt the transparencies assisted in overcoming barriers in communication by using pictures to explain a point, rather than words.

Programed Instruction

Three short samples of programed instruction materials were developed for teachers to try out with their classes or to use as a pattern if they wished to develop programs of their own. Two of the programs, "Abbreviations Used in Food Service" and "Transferring Pattern Markings," featured linear programing. The third program, "Rules for Pinning a Pattern Piece to the Fabric for Cutting," featured intrinsic, or branching, programing.

"Abbreviations Used in Food Service" consisted of seventy-seven frames designed to teach abbreviations for seventeen terms: teaspoon, tablespoon, cup, ounce, pound, pint, quart, gallon, peck, bushel, dozen, bunch, package, crate, barrel, edible portion, and as purchased.

"Transferring Pattern Markings" consisted of forty-four frames which presented advantages, disadvantages, and uses of four methods of transferring pattern markings to the fabric: (1) tracing wheel and tracing carbon, (2) tailor's tacks, (3) small snips, and (4) pins.

"Rules for Pinning a Pattern Piece to the Fabric for Cutting" consisted of four main frames and fourteen branching frames. The program presented three rules for pinning a pattern piece to the fabric:

1. Place the pins perpendicularly to the edge of the pattern.
2. Place pins at the seam line on the pattern piece.
3. Use an appropriate number of pins for each pattern piece.

Several reasons for each of the rules were included.

A letter was sent to the participants in the study briefly describing the three programs. A form was furnished for teachers who wished to use the programs to indicate the number needed. Seventeen teachers requested programs; six requested two different programs, and eleven requested all three. A total of 1,176 programs were requested. Because of the amount of time and expense involved in reproducing and mailing the programs, it was impractical to send this number, so each teacher was sent half the number she requested. The suggestion was made that teachers use answer sheets with the programs so that each program could be used more than once. All seventeen teacher completed evaluation sheets (Appendix B, page 90) after using the programed materials. Results of the evaluation follow.

"Transferring Pattern Markings" was used by fifteen teachers, "Rules for Pinning a Pattern Piece" by fourteen teachers, and "Abbreviations Used in Food Service" by nine teachers. The majority of teachers believed all three programs were most suitable at the ninth grade level; however, teachers who taught eighth grade home economics classes also believed they were suitable for the eighth grade. Some teachers found the programs appropriate in the tenth and eleventh grades, but here they were used primarily for review. Only two teachers believed the programs were appropriate for the twelfth grade (Table XI).

Students and teachers were about equally divided in their preferences for one type programing over the other (Table XII). One teacher stated that she liked both types equally as well, and another indicated

TABLE XI

OPINIONS OF TEACHERS USING PROGRAMED INSTRUCTION MATERIALS REGARDING APPROPRIATE GRADE LEVEL OR LEVELS

Program		Grade Level 8		9		10		11		12	
		N	%	N	%	N	%	N	%	N	%
Transferring Pattern Markings	(N=15)	4	27	11	73	7	47	3	20	1	7
Rules for Pinning a Pattern Piece	(N=14)	6	43	11	79	5	36	2	14	0	0
Abbreviations Used in Food Service	(N=9)	3	33	7	78	4	44	2	22	1	11

Note: Percentages total more than 100% because many teachers believed the programs were appropriate for more than one grade level.

that half her students preferred the linear type, while the other half preferred branching.

TABLE XII

RESPONSES OF SEVENTEEN TEACHERS REGARDING TYPE OF PROGRAM PREFERRED

	Linear		Branching		No Opportunity to Observe	
	N	%	N	%	N	%
Teacher	7	41	6	35	3	18
Students	5	29	6	35	5	29

Note: Percentages do not total 100% because one teacher had no preference and another stated that half her class preferred linear while the other half preferred branching.

Table XIII presents opinions of teachers about the programed materials. All but one of the teachers believed the information in the program was correct and accurate. The one who checked "no" stated that she had been taught to place pins toward the outside of the pattern rather than toward the inside as pictured in the program. This indicates a problem in programing specific techniques used in clothing construction. Every teacher prefers certain methods of construction and authorities recognize many acceptable techniques. This is an inducement for teachers to prepare their own materials, uniquely tailored to their situation.

TABLE XIII

RESPONSES OF SEVENTEEN TEACHERS TO GENERAL QUESTIONS REGARDING PROGRAMED INSTRUCTION MATERIALS

Question	Yes		No	
	N	%	N	%
Is the information in the program correct and accurate?	16	94	1	6
Are there any words in the programs which the students had difficulty understanding?	0	0	17	100
Do you believe the students learned the material in the program?	16	94	1	6
Do you plan to use programed instruction again in your teaching?	16	94	1	6

None of the seventeen teachers indicated that the students had difficulty with any of the words used in the program, and all but one of the teachers believed the students learned the material in the programs. Their opinions were based on tests, discussion, and observation of construction practices. The teacher who indicated that her students did not learn the material stated that they did not follow the instructions in their construction practices.

All but one of the teachers stated that they planned to use programed instruction again in their teaching if it were available. The reasons given for this were: (1) it saves teacher time, (2) it makes learning more effective by requiring student participation in the learning process, and (3) it allows students to progress at their own rate. The one teacher who did not plan to use programed instruction in the

future stated as the reason the fact that "the course is not being offered next year." This would seem to indicate that she was referring to the specific programs developed in this project, rather than to programed instruction in general.

If a large unit of material were to be programed, almost nine-tenths of the teachers preferred several short programs, each presenting a small amount of material, to one long program covering all the material in the unit (Table XIV). This would allow students or teachers to pull out one small part for reference or for review.

TABLE XIV

RESPONSES OF SEVENTEEN TEACHERS REGARDING PREFERRED LENGTH OF PROGRAMS

Description	N	%
One long program covering all material in the unit	2	12
Several short programs, each presenting a small amount of material	15	88

One-third of the teachers expressed an interest in developing their own programs, while three-fourths wished to purchase commercial programs. Two of the teachers checked both because they preferred to use some of each (Table XV). Several teachers were cognizant of the amount of time required in developing a program and indicated that there was no time available for full-time teachers to develop programs of their

own. They expressed a desire for a greater variety of commercial programs than are available at the present time.

TABLE XV

RESPONSES OF SEVENTEEN TEACHERS REGARDING PREFERRED METHOD OF OBTAINING PROGRAMS

Method	N	%
To develop your own programs	6	35
To purchase commercial programs	13	76

Note: Percentages total more than 100% because two of the teachers preferred to use some of each.

Several other suggestions were offered. One teacher suggested that colored illustrations would make the programs more interesting. Adding color and artwork, of course, would add interest; but it would also add a great deal to the cost of teacher-prepared programs. Commercially prepared programs have the advantage of color and professional art work.

Another teacher suggested that more instruction was needed in when and how to use programed instruction most effectively. This idea might suggest a possible topic for an in-service training program. Several of the teachers indicated that programed instruction was an interesting part of the project and expressed a desire to learn more about this method of teaching.

Summary

Chapter III has presented the development and use of audiovisual guidelines and sample audiovisual materials. The guidelines were based on ideas obtained from a questionnaire which was sent to home economics teachers in Oklahoma. The guidelines contained ideas for developing slide sets, transparencies, programed instruction, and 8mm motion pictures and suggestions for use of the materials in home economics classes.

Sample slide sets, transparencies, and programed instruction materials were developed for teachers to use during the year. No 8mm films were developed because only a very small percentage of the teachers had access to a projector for showing them. A short section of the guidelines was devoted to 8mm motion pictures because of the increasing importance of 8mm film in education.

Thirty-six different teachers requested sample materials to use with their classes. Four of the teachers used all three types, twelve used two types, and twenty teachers used only one type. This would seem to indicate that not all teachers prefer the same type of materials and/or that not all teachers have equipment for using all types of materials. Since the sample materials were available only during the spring semester, some of the teachers would not have been teaching units in which the specific materials could be used.

Most of the comments on the evaluation sheets were favorable in regard to the sample audiovisual materials. A large percentage of the teachers plan to use more audiovisual materials in their teaching in the future and several expressed a desire to develop some materials of their own.

CHAPTER IV

EVALUATION OF GUIDELINES AND PROJECT

One aspect of the study was the evaluation of the materials developed by the writer and used by teachers who participated in the study. Results of the evaluation of the guidelines and the project as a whole are presented in Chapter IV.

Evaluation of Guidelines

In order to evaluate the effectiveness of the tentative guidelines developed in the study, a final questionnaire was developed and sent to the sixty-seven teachers who were participating in the project. Part I of the questionnaire dealt with evaluation of the project as a whole and Part II dealt with evaluation of the guidelines on audiovisual instruction in home economics. A copy of the questionnaire may be seen in Appendix A, page 84. Three-fourths of the teachers returned the final questionnaire. The evaluation of the guidelines and the project is based on their responses.

The guidelines were organized into six sections: (1) Introduction, (2) Slides, (3) Transparencies, (4) Programed Instruction, (5) 8mm Motion Pictures, and (6) Commercially Prepared Materials.

Results of the evaluation of the introduction may be seen in Table XVI. Forty-five of the fifty teachers who returned the final questionnaire completed Part II, the part of the questionnaire designed to

evaluate the guidelines. All forty-five believed that the introduction was adequate in acquainting the reader with audiovisual instruction and that the material was easy to understand.

TABLE XVI

EVALUATION OF "INTRODUCTION" SECTION OF GUIDELINES BY FIFTY HOME ECONOMICS TEACHERS

Question	N	%
In acquainting the reader with audiovisual instruction, the introduction was:		
(a) adequate	45	90
(b) inadequate	0	0
In ease of understanding, the material was:		
(a) easy	45	90
(b) difficult	0	0

Note: Five teachers did not complete this section of the questionnaire.

Approximately one-third of the teachers made additional comments such as interesting, informative, and helpful. One teacher suggested that the introduction offered a challenge to teachers to update their teaching methods. Another felt it stimulated teachers who had not used many audiovisual materials to try them with their classes. Although the introduction was only five and one-half pages in length, two teachers stated that they would have liked for it to be shorter, and one of

them suggested a "summary" form. On the whole, however, comments were favorable, and the evaluation of the introduction revealed that it had achieved the purposes for which it had been written, i.e., to acquaint teachers with audiovisual instruction, and to encourage them to use audiovisual materials in their classes.

The evaluation of the four sections of the guidelines dealing with specific types of audiovisual materials may be seen in Table XVII. Total percentages vary because teachers rated only those chapters which they actually used. The largest percentages by far in every category of the four sections are in the "Adequate Information - Easily Understood" column. It would have been most beneficial if the teachers who found certain sections difficult to understand or inadequate had given specific suggestions for improvement, but the largest percentage of specific comments came from teachers who felt the material was adequate and easily understood.

The material in the "Slides" section was used by more than half of the teachers who completed the final questionnaire. Of the eight teachers who indicated that any part of the material was difficult to understand or inadequate, only one made any comment whatsoever. Her comment was that she felt unsure of herself because of lack of experience with photography.

Approximately one-half of the teachers indicated that they had used the section on "Transparencies." Only three teachers checked "difficult" or "inadequate" for any part of the material in this section, and not one of them made any comments.

More than one-half of the teachers used the first two parts of the section on "Programed Instruction," and about one-fourth of the teachers

TABLE XVII

EVALUATION OF SECTIONS OF GUIDELINES DEALING WITH SPECIFIC TYPES OF AUDIOVISUAL MATERIALS BY FIFTY HOME ECONOMICS TEACHERS

Section	A[a]		D[b]		I[c]	
	N	%	N	%	N	%
Slides:						
(a) Explanation of medium	32	64	2	4	0	0
(b) Use in teaching	28	56	1	2	1	2
(c) Development of materials	24	48	4	8	0	0
Transparencies:						
(a) Explanation of medium	28	56	0	0	0	0
(b) Use in teaching	23	46	1	2	1	2
(c) Development of materials	24	48	1	2	0	0
Programed Instruction:						
(a) Explanation of medium	32	64	2	4	0	0
(b) Use in teaching	27	54	2	4	1	2
(c) Development of materials	18	36	5	10	2	4
8mm Motion Pictures:						
(a) Explanation of medium	21	42	0	0	0	0
(b) Use in teaching	15	30	0	0	2	4
(c) Development of materials	13	26	2	4	2	4

[a]Adequate information, easily understood

[b]Adequate information, difficult to understand

[c]Inadequate information

Note: Total percentages vary because teachers evaluated only those sections which they actually used.

used the last part. Teachers indicating difficulty in understanding or inadequacy of material in this section commented that since programed instruction was completely "new" to them they needed more information. Since programed instruction is actually a method of teaching, rather than a supplement to teaching, it requires study in depth for understanding. This section probably should have included a list of references for those teachers who were interested in learning more about programed instruction and who have the time to develop programs of their own.

Fewer teachers used the section on 8mm motion pictures. This may be partly due to the fact that very few of them had equipment for development or use of these materials. Because of the unavailability of equipment among the teachers, this section was shorter than the rest. It was designed primarily to acquaint teachers with this new medium of instruction which may offer many possibilities for home economics in the near future. The six teachers who indicated that certain sections were difficult to understand or inadequate suggested that since this was a new medium and teachers were unfamiliar with it, more information was needed. One teacher, however, commented that she felt 8mm motion pictures were "more familiar" than the other media because of her experience with 16mm motion pictures.

Most of the comments about the material in these four sections were very favorable. Comments such as well-planned, good examples, informative and inspirational, interesting and helpful were frequent. One teacher stated that she especially appreciated the section on "Slides" because she owned a "little used" slide camera, which she is now interested in using.

Evaluation of the "Commercially Prepared Materials" section may be seen in Table XVIII. Three-fourths of the teachers believed the section was adequate, slightly under one-tenth felt the section was inadequate, and the remaining teachers neglected to complete this section. Two of the teachers who checked "inadequate" suggested including the price of the materials. Prices were not included in the guidelines because the price of materials changes frequently. A third teacher wanted all subject matter areas of home economics included, but since this project was limited to three subject matter areas, this was beyond the scope of the study.

TABLE XVIII

EVALUATION OF "COMMERCIALLY PREPARED MATERIALS" SECTION OF GUIDELINES BY FIFTY HOME ECONOMICS TEACHERS

Question	N	%
The materials listed in this section were:		
(a) adequate	38	76
(b) inadequate	4	8

Note: Eight teachers did not complete this section of the questionnaire.

Teachers were asked to list titles and producers of any commercially prepared materials which they believed should be added to the list. The following materials were listed: (1) "Baby Care" -

Johnson & Johnson, and (2) "Your Silhouette Is Showing" - Simplicity.

Teachers were also asked to provide a description of audiovisual materials which they had developed during the year. More teachers described transparencies than any other type of materials. Three teachers developed transparencies on job orientation, and two developed transparencies on the study of meats. Two teachers developed transparencies on clothing construction, utilizing ideas from "How to" sheets in dress patterns.

Transparencies were also developed in the area of housing, including period styles of furniture, window treatments, floor plans, and room arrangements. One teacher developed transparencies to illustrate the art principles. Another teacher used color-lifts from magazines to illustrate uses of color and design in houses. One teacher developed programed instruction materials on weights and measures, while another developed a super 8 motion picture on a unique method of making sandwiches in a restaurant.

In general, teachers seemed to be pleased with the information included in the guidelines. One teacher commented, "A very excellent coverage of the subject. The material seems quite complete and to the point without an unnecessary amount of reading for a busy teacher." Many teachers noted that they planned to use the guidelines in developing audiovisual materials for their classes next year.

Evaluation of the Project

Several questions designed to evaluate the effectiveness of the project in encouraging teachers to use audiovisual instruction in their home economics classes were included in the final questionnaire. Types

of audiovisual materials used during the year by the fifty teachers who returned their questionnaires may be seen in Table XIX.

About two-fifths of the teachers used commercially prepared slides, and almost one-third used the slides prepared as a part of this project. Only two teachers used slides which they had prepared themselves. Much time is required in the development of a slide series, and some of the teachers indicated that they planned to develop slide sets during the period of extended employment in the summer.

TABLE XIX

TYPES OF AUDIOVISUAL MATERIALS USED BY FIFTY HOME ECONOMICS TEACHERS DURING THE 1967-68 SCHOOL YEAR

Materials	Commercially Prepared		Teacher Prepared		Prepared as a Part of this Project	
	N	%	N	%	N	%
Slides	20	40	2	4	15	30
Transparencies	25	50	24	48	13	26
Programed Instruction	15	30	3	6	20	40
8mm Motion Pictures	13	26	1	2	0	0

Thirty-one different teachers used slides during the year. This represents sixty-two per cent of the teachers returning their final questionnaires. A comparison of this with responses from the first questionnaire (Table I, page 29) shows an increase of seven per cent in

the number of teachers using slides in their classes.

One-half of the teachers used commercial and teacher-made transparencies, and about one-fourth used transparencies prepared as a part of this project. Thirty-five different teachers (70%) used transparencies during the year. This represents a decrease of two per cent from the first questionnaire. This apparent decrease might be accounted for by the fact that many of the seventeen teachers who returned the first questionnaire but not the second may have used transparencies prior to 1967-68.

More teachers used programed instruction materials prepared as a part of this project than any other type, however, almost one-third used commercially prepared programs. Only a small percentage (6%) used programs they had developed themselves. Thirty-one different teachers (62%) used programed instruction during the year. This is twice the percentage of teachers who had used programed instruction prior to this year (Table I, page 29).

The number of teachers using 8mm motion pictures has also increased. Fourteen different teachers (28%) indicated that they had used 8mm motion pictures during the year. A comparison with the number of teachers who had used 8mm motion pictures prior to this year shows an increase of ten per cent. All but one of the teachers using 8mm motion pictures used commercial materials. One teacher used a movie she had prepared herself.

Although few materials used during the year were teacher prepared, many teachers indicated that they intended to develop materials for their classes during the summer. Several of them have asked for summer school courses or extension classes in the development of audiovisual

materials. Whether the guidelines gave teachers enough information to actually produce materials of their own or not, an interest in audiovisual instruction seems to have been stimulated. Interest is necessarily a first step in finding ways to use audiovisual instruction effectively in the classroom.

A listing of the materials and equipment used by the teachers for the first time during the 1967-68 school year might give some indication of the motivation afforded teachers by the project. Materials used for the first time during the year may be seen in Table XX.

Almost half of the teachers used programed instruction for the first time during the year. The short programs developed as a part of this project gave many of them their first experiences with programed instruction.

About one-fourth of the teachers used transparencies for the first time during the year. Three teachers stated that the project had inspired them to request an overhead projector so that they would be able to use transparencies in their teaching. More teachers had used transparencies prior to this year than any of the other three media (Table I, page 29), so the "one-fourth" probably represents a very large proportion of those who had not used transparencies previously.

Approximately one-sixth of the teachers used slides for the first time during the year. Slightly more than half of the teachers in the study had used slides previously. Several teachers noted that the classrooms they used could not be darkened, and that it was impossible to use slides unless they moved to another room. Because of this inconvenience, it is doubtful whether a much larger percentage than are now using slides will do so in the near future. Slides may be used for

individual or very small group instruction in a lighted room. Rear-view projection also allows for viewing in a lighted room. As teachers find ways for using slides in this manner, the percentage using slides may increase.

TABLE XX

MATERIALS USED FOR THE FIRST TIME DURING THE 1967-68 SCHOOL YEAR BY FIFTY HOME ECONOMICS TEACHERS

Materials	N	%
Programed Instruction	21	42
Transparencies	12	24
Slides	9	18
8mm Motion Pictures	1	2

Only one teacher used 8mm motion pictures for the first time this year. Since the development of this medium is more recent than the other three, use of it will probably increase substantially during the next few years. An increasing number of 8mm motion pictures are appearing on the market, and schools are gradually acquiring equipment for use of these films.

The one teacher who used 8mm motion pictures for the first time had a student make a short movie of a food preparation process for a class demonstration, contrasting commercial food preparation with food

preparation in the home. As teachers become more familiar with the potential of 8mm film in home economics, many more ideas may be utilized.

Equipment acquired and equipment used for the first time during the year may be seen in Table XXI. Several pieces of audiovisual equipment were acquired. More than half of the new equipment was for the use and development of transparencies. Slightly more than one-third of the schools acquired overhead projectors. About one-fifth of the schools added either a heat transfer copier or a photo-reflex copier for making transparencies from masters. The large quantity of equipment acquired to assist in the use of transparencies would seem to indicate the popularity of and familiarity with the medium. Perhaps teachers have also found that the overhead system is an effective method of instruction.

Programed textbooks, slide projectors, and 8mm projectors were added by about one-eighth of the schools. One school acquired a slide camera and another a rear-view projector. Indications point toward addition of more of these types of materials in the future.

The piece of equipment used for the first time by the greatest number of teachers was the overhead projector. One-sixth of the teachers used the overhead projector for the first time. Three teachers used a slide projector and two used the heat transfer copier for the first time. The photo-reflex copier, super 8 projector, rear-view projector, and slide camera were each used for the first time by one teacher. This represents a total of seventeen teachers (34%) using some piece of audiovisual equipment for the first time during the year.

TABLE XXI

EQUIPMENT ACQUIRED AND EQUIPMENT USED FOR THE FIRST TIME DURING THE 1967-68 SCHOOL YEAR BY FIFTY HOME ECONOMICS TEACHERS

Equipment	N	%
Equipment acquired during the year:		
(a) Overhead projector	18	36
(b) Heat transfer copier	6	12
(c) Programed textbooks	6	12
(d) Slide projector	6	12
(e) Photo-reflex copier	5	10
(f) 8mm motion picture projector	4	8
(g) Super 8 projector	2	4
(h) Slide camera	1	2
(i) Rear-view projector	1	2
Equipment used for the first time during the year:		
(a) Overhead projector	8	16
(b) Slide projector	3	6
(c) Heat transfer copier	2	4
(d) Photo-reflex copier	1	2
(e) Super 8 projector	1	2
(f) Rear-view projector	1	2
(g) Slide camera	1	2

Purposes for which audiovisual materials were used during the year may be seen in Table XXII. The purposes checked for using audiovisual instruction during the year were much the same as the purposes for which audiovisual materials had been used prior to the year 1967-68 (Table I, page 29). Motivation was at the top of the list with about seven-eighths of the teachers using audiovisual materials for this purpose. Small group instruction, which was not listed on the first questionnaire but was written in by some of the teachers, was checked by approximately two-thirds of the teachers on the final questionnaire. Almost

two-thirds used audiovisual materials for large group instruction during the year as compared with three-fourths prior to this year. Approximately the same per cent (40%) used audiovisual materials for evaluation during the year as previously. Three teachers stated that they used audiovisual instruction for "review and emphasis" and two noted that they had used it with "adult classes."

TABLE XXII

PURPOSES OF FIFTY HOME ECONOMICS TEACHERS FOR USING AUDIOVISUAL MATERIALS DURING THE 1967-68 SCHOOL YEAR

Purpose	N	%
Motivation	42	84
Small group instruction	34	68
Large group instruction	31	62
Evaluation	20	40
Other	5	10

The similarity of the responses of the teachers regarding purposes for using audiovisual instruction on the first and on the final questionnaire would seem to indicate that the guidelines had very little, if any, influence on purposes for which audiovisual instruction was used in the classroom. A longer list of purposes could have yielded different information, but too long a list could have discouraged some

teachers from answering the question.

The ways teachers felt the project was of value to them may be seen in Table XXIII. The value checked by the greatest number of teachers (three-fourths) was "increased interest in audiovisual instruction." Many of the teachers added a note to the questionnaire stating that they had developed an interest in audiovisual instruction and that they hoped to have an opportunity to learn more about it in the near future.

TABLE XXIII

VALUE OF PARTICIPATION IN THE PROJECT AS RATED BY FIFTY HOME ECONOMICS TEACHERS

Value	N	%
Increased interest in audiovisual instruction	38	76
Encouraged trying new methods or materials	35	70
Brought up-to-date information on recent developments in audiovisual instruction	33	66
Provided guidelines for future use of audio-visual instruction	32	64
Provided actual audiovisual materials for use with classes	30	60
Others	1	2

Slightly more than two-thirds of the teachers were encouraged to try new methods or materials. One teacher noted that the project had "proved to open an avenue of thinking along the lines of audiovisual

materials which could be used by the busy teacher." Another wrote, "The project has sparked enthusiasm in me for developing more materials for use in my classroom." A third teacher noted that "the materials have encouraged me to attempt to develop some programed instruction materials."

Approximately two-thirds believed the project brought them up-to-date on recent developments in audiovisual instruction. One teacher noted that the project was worthwhile because "teachers are too heavily loaded to even be fully informed about audiovisual materials." Another teacher commented that the project had been beneficial in acquainting her with "new materials and ideas."

Almost two-thirds felt the project provided guidelines for future use of audiovisual instruction. Several teachers stated that during the summer they planned to use the guidelines to assist them in developing materials for their classes next fall. One teacher expressed her plans for keeping the material for reference purposes and adding new materials on audiovisual instruction as they become available.

Slightly more than one-half of the teachers indicated that the project provided actual materials for use with their classes. It might be desirable if the materials developed could be made available for teachers to check out and use with their classes again in the future. In fact, one teacher has already sent in a request to use the slide set on zipper application next September 30.

The teacher who checked "other" values of participation in the project noted that if it had not been for the project she would not have asked for the overhead projector which she received just a few days before returning the final questionnaire. She expressed a desire

to begin using it immediately.

Many of the teachers actually expressed their thanks for the opportunity of being a participant in the project. So many of them have requested summer or extension courses in the development of audiovisual materials that an extension course in this area is being considered for the fall semester.

Summary

Chapter IV has presented the results of the evaluation of the guidelines and the project. The final questionnaire on which the evaluation was based was sent to the sixty-seven participants in the project and was returned by three-fourths of them.

A large percentage of the teachers believed the guidelines were adequate and easily understood. Many expressed appreciation for the information on audiovisual instruction and for the opportunity to participate in the project.

Several teachers expressed the feeling that there was a lack of time for teachers to prepare their own materials. They would like to have more and better commercial materials developed. Many of the teachers expressed a desire for more training in development and use of audiovisual materials.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

This study was designed to acquaint home economics teachers with selected types of audiovisual materials and to provide information which would assist the teachers in developing audiovisual materials of their own. Objectives of the study were: (1) to determine types of audiovisual materials and equipment currently being used by secondary teachers of home economics in Oklahoma and to locate areas in which assistance is needed and desired, (2) to set up tentative guidelines for development and use of audiovisual materials and to develop sample audiovisual materials illustrating ideas presented in the guidelines, (3) to evaluate the tentative guidelines and audiovisual materials used in the study, and (4) to make recommendations for revision of the guidelines and audiovisual materials in accordance with the evaluation of the tentative materials.

A review was made of literature relevant to the study and a need for the study was substantiated. A questionnaire was developed and sent to the seventy-eight Oklahoma home economics teachers who either teach gainful employment classes or cooperate with Oklahoma State University in the student teaching program. A total of sixty-seven teachers returned the questionnaire indicating a desire to participate in the project.

Guidelines for development and use of audiovisual materials in

home economics were developed on the basis of responses to the questionnaire. The guidelines were sent to all participating teachers early in the fall semester, 1967-68. Sample audiovisual materials were developed to illustrate ideas presented in the guidelines. Throughout the spring semester the sample materials were used and evaluated by participating teachers.

In April, the teachers were sent a final questionnaire for evaluation of the guidelines and the project as a whole.

Conclusions

The following conclusions were delineated from the data.

1. The home economics teachers who participated in the study used a variety of audiovisual materials, and most of the teachers indicated an interest in learning more about use and development of audiovisual materials.

2. The guidelines developed in the study seemed to be adequate and helpful in bringing the teachers up-to-date on developments in audiovisual instruction and in inspiring many of them to try new methods and materials during the year.

3. Teachers who used the sample audiovisual materials indicated that the materials were interesting and effective in teaching the concepts for which they were designed.

4. Not all teachers have access to the necessary equipment for effective use of audiovisual instruction. Frequently when the equipment is available the classroom cannot be darkened sufficiently or the equipment is inconveniently located in relation to the home economics classroom. There is also a general feeling of a lack of time available

for home economics teachers to develop audiovisual materials.

5. Some teachers who have audiovisual equipment available are not using it, even though the percentage of teachers using audiovisual instruction increased during the period covered by the project. Responses of teachers indicated a need for assistance and/or training in development of audiovisual materials and use of audiovisual equipment.

Recommendations

In view of responses on the final questionnaires and comments on the evaluation sheets, the following recommendations are suggested for revision of the guidelines and sample audiovisual materials.

Guidelines

1. Add a list of references to each section for the convenience of teachers who wish to study one medium in depth or for those who need additional information for development and use of materials.

2. Expand the section on 8mm motion pictures, since use of this medium is likely to increase in the near future.

3. Expand the section on development of programed instruction materials by including examples of linear and branching frames.

4. Clarify and expand the description of the color-lift process.

Sample Audiovisual Materials

1. Redevelop the "Zipper Application" series using a dress of a lighter color and sufficient bracketing of exposures that slides may be selected which will have proper color.

2. In the "Outdoor Play Equipment" set, replace slide fourteen

with a slide showing the entire piece of equipment rather than only a section of it. Revise the script for slide sixteen to include a warning about the concrete pads under the seesaw.

3. Continue to use the transparencies and programed instruction materials as they are since no revisions were indicated on the evaluation sheets.

Implications

The following implications for further study appear justified.

1. Study needs of teachers in regard to different types of audiovisual materials and develop guidelines for use of the materials in all subject matter areas of home economics.

2. Measure attitudes of teachers toward audiovisual instruction; then provide training in audiovisual methods and re-test to determine whether attitudes had changed and in what direction.

3. Study in depth each of the media included in this project and make specific recommendations for the type of subject matter most suitable for the particular method of presentation.

4. Experiment with the practicality and effectiveness of combining two or more types of audiovisual materials into a "package" of instructional materials for individual instruction.

5. Interview a group of selected teachers to determine their audiovisual practices. Provide in-service training for the teachers and re-evaluate to determine the effect of the in-service training.

A SELECTED BIBLIOGRAPHY

1. Action for Improvement of Teacher Education. 1965 Yearbook. Washington, D. C.: American Association of Colleges for Teacher Education.

2. Allen, W. H. "Audio-visual Materials," Review of Educational Research, XXVI (April, 1956), 125-156.

3. Boardman, Thomas H. "Audio-Visual and the Educational Lag," Education, LXXXVII (January, 1967), 288-291.

4. Briggs, Leslie J. (Editor). "Instructional Aids," Journal of Higher Education, XXXV (March, 1964), 172-174.

5. Brown, James W., Richard B. Lewis and Fred F. Harcleroad. A-V Instruction Materials and Methods. New York: McGraw-Hill Book Company, 1964.

6. Buley, Hilton C. "Multi-Media for Instruction." In Action for Improvement of Teacher Education. 1965 Yearbook. Washington, D. C.: American Association of Colleges for Teacher Education. 77-84.

7. Coltharp, Joe. Production of 2x2 Inch Slides for School Use. Austin, Texas: Visual Instruction Bureau, The University of Texas, 1967.

8. Cross, A. J. Foy and Irene F. Cypher. Audio-Visual Education. New York: Thomas Y. Crowell Company, 1961.

9. Crowder, Norman A. "On the Differences Between Linear and Intrinsic Programming." In Educational Technology, John P. DeCecco (Editor). New York: Holt, Rinehart and Winston, Inc., 1964. 142-152.

10. Dahl, J. O. and J. H. Breland. Food Standards Handbook for Quantity Cookery. Stamford, Connecticut: Dahl Publishing Company, 1945.

11. Dale, Edgar. Audio-Visual Methods in Teaching. New York: The Dryden Press, 1954.

12. Dale, Edgar. "Creating the Future," The News Letter, XXXII (May, 1967), 1-4.

13. DeCecco, John P. (Editor). Educational Technology. New York: Holt, Rinehart and Winston, Inc., 1964.

14. DeKieffer, Robert E. Audiovisual Instruction. New York: The Center for Applied Research in Education, Inc., 1965.

15. Fleck, Henrietta. "Independent Study," Forecast for Home Economics, XII (December, 1966), F-7 - F-8.

16. Fleck, Henrietta. Toward Better Teaching of Home Economics. New York: McGraw-Hill Book Company, 1968.

17. Florio, A. E. and G. T. Stafford. Safety Education. New York: McGraw-Hill Book Company, Inc., 1962.

18. Forsdale, Joan Rosengren (Editor). 8: Newsletter of 8mm Film in Education. Project in Educational Communication of the Horace Mann-Lincoln Institute of School Experimentation, No. 1. New York: Teachers College, Columbia University, 1965.

19. Forsdale, Louis. 8mm Sound Film and Education. New York: Teachers College, Columbia University, 1962.

20. Forsdale, Louis, Joan Rosengren Forsdale and John Swayze. 8: A Point of View. Project in Educational Communication of the Horace Mann-Lincoln Institute of School Experimentation. New York: Teachers College, Columbia University. (n.d.)

21. Gage, N. L. (Editor). Handbook of Research on Teaching. Chicago: Rand McNally and Company, 1963.

22. Garner, W. Lee. Programed Instruction. New York: The Center for Applied Research in Education, Inc., 1966.

23. Glaser, Robert. "Christmas Past, Present, and Future: A Review and Preview." In Teaching Machines and Programmed Learning, A. A. Lumsdaine and Robert Glaser (Editors). Washington, D. C.: National Education Association, 1960. 23-31.

24. Green, Marjorie M. and Elizabeth L. Woods. A Nursery School Handbook for Teachers and Parents. Sierra Madre, California: Sierra Madre Community Nursery School Association, 1963.

25. Hofer, Armand G. "Be Prepared for Programed Instruction," American Vocational Journal, XLII (January, 1967), 32-34.

26. "How to Select Teaching Aids," What's New in Home Economics, XXXI (October, 1967), 28-30.

27. Kemp, Jerrold E. Planning and Producing Audiovisual Materials. San Francisco: Chandler Publishing Company, 1963.

28. Kinder, James S. Audio-Visual Materials and Techniques. New York: American Book Company, 1959.

29. Lumsdaine, A. A. "Instruments and Media of Instruction." In Handbook of Research on Teaching, N. L. Gage (Editor). Chicago: Rand McNally and Company, 1963.

30. Lumsdaine, A. A. and Robert Glaser (Editors). Teaching Machines and Programmed Learning. Washington, D. C.: National Education Association, 1960.

31. Mager, Robert F. Preparing Objectives for Programed Instruction. San Francisco: Rearon Publishers, 1962.

32. Markle, Susan Meyer. Good Frames and Bad. New York: John Wiley and Sons, Inc., 1964.

33. Mauck, Francis F. Modern Sewing Techniques. New York: The Macmillan Company, 1963.

34. McGrath, G. D., James J. Jelinek and Raymond E. Wochner. Educational Research Methods. New York: The Ronald Press Company, 1963.

35. "New Directions for Education - Education for Technology," Audiovisual Instruction, XII (June/July, 1967), 573-575.

36. Oerke, Bess V. Mealtime. Peoria, Illinois: Charles A. Bennett Company, Inc., 1960.

37. Olsen, James. "8mm Film - An Educational Breakthrough?" Education Forum, XXXI (November, 1966), 103-106.

38. "Overhead Projector Provides New Creativity for Teaching," What's New in Home Economics, XXXI (March, 1967), 54-61.

39. Parke, Margaret B. "Teaching Materials and Their Implementation," Review of Educational Research, XXXVI (June, 1966), 380-387.

40. Phillips, Murray G. "Learning Materials and Their Implementation," Review of Educational Research, XXXVI (June, 1966), 373-379.

41. Pollard, L. Belle. Experiences With Foods. New York: Ginn and Company, 1956.

42. Rago, U. Frank. "Making and Using Audiovisuals," The Instructor, LXXVI (March, 1967), 111-112.

43. Ruark, Henry C., Jr. "The Teacher Is the Key," Educational Screen and AV Guide, XLVIII (February, 1968), 13, 22.

44. Schultz, Morton J. The Teacher and Overhead Projection. New Jersey: Prentice-Hall, Inc., 1965.

45. Smith, Richard E. The Overhead System: Production, Implementation and Utilization. Austin, Texas: Visual Instruction Bureau, The University of Texas. (n.d.)

46. Stolurow, Lawrence M. "Implications of Current Research and Future Trends." In Educational Technology, John P. DeCecco (Editor). New York: Holt, Rinehart and Winston, Inc., 1964.

47. Sturm, Mary Mark and Edwina H. Grieser. Guide to Modern Clothing. New York: McGraw-Hill Book Company, 1962.

48. Thieme, Eberhard. "Single-Concept Films Provide Continuous Instruction," What's New in Home Economics, XXXI (April, 1967), 46, 48.

49. VanderMeer, A. W. "The Use of Newer Media in a Multiversity." In Action for Improvement of Teacher Education. 1965 Yearbook. Washington, D. C.: American Association of Colleges for Teacher Education. 88-92.

50. Withrow, Frank B. "Status of 8mm Motion Pictures in the Classroom," Volta Review, LXVIII (November, 1966), 670-672.

51. Wittich, Walter Arno and Charles Francis Schuller. Audiovisual Materials. New York: Harper and Row, 1967.

52. Wyman, Ray. "Creating Readable Transparencies," The Instructor, LXXVI (May, 1967), 104.

53. Wyman, Ray. "From Paper to Overhead Projector," The Instructor, LXXVI (December, 1966), 118-119.

54. Wyman, Raymond and Ronald H. Frederickson. "The Feasibility of Distributing Locally Produced Overhead Projection Masters," Audiovisual Instruction, XII (April, 1967), 368-370.

APPENDIX A

QUESTIONNAIRES

QUESTIONNAIRE

PART I. Please answer the following questions by placing an X in the appropriate blanks.

Which of the following have you used with your classes?

_____ slides
_____ transparencies
_____ programed instruction
_____ 8mm motion pictures

In which of the following have you prepared materials for use in your classes?

_____ slides
_____ transparencies
_____ programed instruction
_____ 8mm motion pictures

In which of the following have you used commercially prepared materials?

_____ slides
_____ transparencies
_____ programed instruction
_____ 8mm motion pictures

For what purposes do you use audiovisual materials?

_____ motivation
_____ provide large group instruction
_____ provide individual instruction
_____ evaluation
_____ other (list)_____

PART II. Place an X in the blank indicating the type of equipment which is available for use in your classes or for the preparation of audiovisual materials.

Projectors:

_____ slide projector
_____ overhead projector
_____ 8mm motion picture projector

_____ super 8mm motion picture projector

Cameras:

_____ slide camera
_____ 8mm motion picture camera
_____ super 8 motion picture camera

Duplicating equipment for transparencies:

_____ heat transfer copier
_____ diazo copier
_____ photo-reflex copier
_____ other (please specify)_____

Programed instruction equipment:

_____ electric teaching machines
_____ manual teaching machines
_____ programed textbooks
_____ other (please specify)_____

PART III. With which of the following would you like help?

_____ developing slide sets
_____ making transparencies to use with overhead projector
_____ developing short programed instruction materials
_____ developing 8mm motion pictures
_____ selecting commercially prepared audiovisual materials
_____ compiling information on where to find and how to order commercially prepared audiovisual materials
_____ evaluating the effectiveness of audiovisual materials
_____ preparing the class for learning through audiovisual materials
_____ determining which medium would be most effective for teaching a particular concept
_____ others (please list)_____
_____
_____

Please list several concepts, skills, or bits of information which you believe might be more effectively taught with the aid of audiovisual materials. (For example, outdoor play equipment for child care centers, or how to replace a worn-out pocket in men's trousers.)

_____
_____
_____
_____
_____

FINAL QUESTIONNAIRE

PART I. Evaluation of the Project

1. On the following grid, place an X in the squares indicating the types of audiovisual materials which you used in your classes during the school year, 1967-1968.

	Used Commercially Prepared Materials	Used Materials You Prepared Yourself	Used Materials Prepared as a Part of this Project
Slides			
Transparencies			
Programed Instruction			
8mm Motion Pictures			

2. Which of the following have you used with your classes for the first time this year? Slides___ Transparencies___ Programed instruction ___ 8mm motion pictures___

3. For what purposes have you used audiovisual materials this year?
Motivation___ Large group instruction___ Small group instruction___
Evaluation___ Other (list)_____
_____

4. Check which of the following pieces of equipment you have acquired in your department or school this year.

8mm motion picture projector___
super 8 motion picture projector___
slide projector___
overhead projector___
motion picture camera___
slide camera___
heat transfer copier___
diazo copier___
photo-reflex copier___
electric teaching machines___
manual teaching machines___
programed textbooks___
other (please specify)_____

5. List any pieces of audiovisual equipment which you used this year that you had not used before._____
_____

6. In which of the following ways do you believe your participation in this project was of value to you as a teacher?

   Increased your interest in AV (audiovisual) instruction___
   Brought you up-to-date on recent developments in AV instruction___
   Encouraged you to try new methods or new materials___
   Provided you with guidelines for developing AV materials in the future___
   Provided you with AV materials for you to try out with your classes___
   Others (please list)_____
   _____
   _____

PART II. Evaluation of Guidelines on Audiovisual Instruction in Home Economics

Indicate your answer by placing an X in the appropriate blanks. Please give specific information and/or suggestions for improving the parts you believe are inadequate or difficult to understand under "Comments."

7. The "Introduction" section was adequate___ inadequate___ in acquainting the reader with audiovisual instruction.

8. The "Introduction" section was easy___ difficult___ to understand.

9. Comments on "Introduction" section: _____
   _____
   _____
   _____

10. By placing the appropriate letter in the proper square on the grid, please indicate the adequacy or inadequacy of the guidelines in the sections presenting the four media.

    A = adequate information - easily understood
    D = adequate information, but difficult to understand
    I = inadequate information

	Explanation or Description of Medium	Suggestions for use in Teaching	Development and Preparation of Materials
Slides			
Transparencies			
Programed Instruction			
8mm Motion Pictures			

11. Comments on sections presenting the four media:_____

12. The section on "Commercially Prepared Materials" was adequate___ inadequate___.

13. Comments on "Commercially Prepared Materials" section:_____

14. List any commercial materials which you feel should be added to the list._____

15. The guidelines will be revised according to the information which you give on this questionnaire. Are there other comments you wish to make regarding the content of the guidelines?_____

16. Please list and give a brief description of the AV materials you developed this year._____

17. Are there general comments you wish to make regarding the project?

APPENDIX B

EVALUATION SHEETS FOR SAMPLE MATERIALS

EVALUATION SHEET FOR SLIDE SERIES

1. Please check which slide series you used.

   Outdoor Play Equipment _____
   Zipper Application _____

2. In your opinion, for what grade level are the materials appropriate?

	Grade Level (circle one or more)				
Outdoor Play Equipment	8	9	10	11	12
Zipper Application	8	9	10	11	12

3. In your opinion, is the information in the slide series correct and accurate? yes___ no___ If your answer is no, please list items which you believe are incorrect._____
   _____

4. Did the individual slides clearly show what they were supposed to? yes___ no___ If you believe some of the individual slides need to be improved, please list the number of the slide and indicate in which series the slide is found. Series_____ Slide numbers____

5. Did the slide series tell the story? (i.e., were there enough to get the point across, but not so many as to be boring) yes___ no___ I would prefer more___ fewer___ the same number___ of slides in the series.

6. Do you believe that the students benefited from viewing the slide series? yes___ no___ In what ways?_____
   _____

7. Would you like to own these sets of slides (or similar sets) so that they could be referred to by individual students whenever necessary? yes___ no___

8. Do you have suggestions for improving either the slides or the script?_____
   _____

9. Do you plan to use sets of slides in your future teaching? yes___ no___ For what purpose_____

10. Which would you prefer?

    To develop your own sets of slides?___
    To buy commercially prepared sets of slides?___
    To borrow sets of slides (e.g., from the state university audio-visual center)___

11. Are there other general comments you wish to make:

EVALUATION SHEET FOR TRANSPARENCIES

1. Please check which transparencies you used.

   Kitchen Safety___
   Sewing on Buttons___
   Kinds of Toys___

2. In your opinion, for what grade level are the materials appropriate?

	Grade Level (circle one or more)				
Kitchen Safety	8	9	10	11	12
Sewing on Buttons	8	9	10	11	12
Kinds of Toys	8	9	10	11	12

3. In your opinion, is the information on the transparencies correct and accurate? yes___ no___. If your answer is no, please list items you believe are incorrect._____

   _____

4. Do you believe the transparencies contributed to more effective learning? yes___ no___. In what way?_____

   _____

5. If cost were no object which would you prefer?

   To hand-make your own transparencies___
   To make your own transparencies from purchased "originals"___
   To purchase commercially prepared color transparencies___

6. Considering that commercially prepared transparencies are about twice as expensive as transparencies made from printed originals, and that transparencies made from printed originals are about twice as expensive as hand-made ones, which would you prefer?

   To hand-make your own transparencies___
   To make your own transparencies from purchased "originals"___
   To purchase commercially prepared color transparencies___

7. What do you believe is the most important contribution that use of transparencies with the overhead projector can make to the teaching of home economics?_____

   _____

8. Do you have suggestions for improving either the transparencies or the idea sheets?_____

   _____

9. Are there other general comments you wish to make?_____

   _____

   _____

EVALUATION SHEET FOR PROGRAMED INSTRUCTION BOOKLETS

1. Please check the programed material which you used:

   Transferring Pattern Markings (Linear)____
   Rules for Pinning a Pattern Piece (Branching)___
   Abbreviations Used in Food Service (Linear)___

2. In your opinion, for what grade level are the materials appropriate?

	Grade level (circle one or more)				
Transferring Pattern Markings	8	9	10	11	12
Rules for Pinning a Pattern Piece	8	9	10	11	12
Abbreviations Used in Food Services	8	9	10	11	12

3. Which type of program do you prefer?
   Linear___ Branching___ I only used one type___

4. Why do you prefer the type checked in item 3?_____
   _____

5. Which type do the students prefer? Linear___ Branching___ No opportunity to observe___

6. Do you believe the students learned the material in the program? yes___ no___ On what do you base your opinion? (test, conversation, observation, etc.)_____

7. In your opinion, is the information in the programs correct and accurate? yes___ no___ If your answer is no, please list those items which you believe to be incorrect._____

8. Are there any words in the programs which the students had difficulty understanding? yes___ no___ If so, please list the words.
   _____

9. If a large unit of material were being programed, which would you prefer?

   One long program covering all material in the unit___
   Several short programs (such as these) presenting only one section of material so that each section could be used individually or all sections could be used as a set___

10. Are there any other suggestions you would like to make regarding the material in these three programs?_____
    _____

11. Do you plan to use programed instruction again in your teaching? yes___ no___ Why or why not?_____

12. Which would you prefer?

    To develop your own programs___
    To use programs which were available commercially___

13. Are there other general comments you wish to make?

APPENDIX C

DESCRIPTION OF SLIDES AND GUIDELINES

ZIPPER APPLICATION

Slide No.	Description
1.	(Title slide) Zipper Application
2.	Finished dress on girl - front view - medium range
3.	Finished dress on girl - back view - medium range
4.	Finished dress on girl - close-up shot of zipper
5.	Sections of dress and facing with shoulder seams joined
6.	Back of dress with center back seam joined below placket
7.	Close-up of placket with seam allowances pressed back
8.	Medium range shot of #7 showing entire length of center back seam
9.	Close-up of facing showing finished outer edge
10.	Close-up of facing showing seam allowances pressed back
11.	Close-up showing facing pinned to neckline
12.	Close-up showing seam allowances being turned over facing
13.	Close-up showing seam allowances turned and pinned over facing
14.	Close-up showing stitched neckline seam
15.	Close-up showing the trimming of the neckline seam
16.	Close-up of trimmed and clipped neckline seam
17.	Close-up at machine showing method of understitching facing
18.	Medium range shot of facing after understitching
19.	Wrong side of dress showing facing turned to inside
20.	Zipper pinned to right side of placket - (right side of dress)
21.	Wrong side of dress showing handling of top of zipper tape
22.	Close-up at machine - stitching right side
23.	Close-up showing finished right side
24.	Left side of placket pinned over stitching on right side
25.	Close-up showing placket slip-basted.
26.	Close-up showing method of stitching left side by hand
27.	Wrong side of dress showing handling of top of zipper tape
28.	Facing pinned over zipper tape - (wrong side of dress)
29.	Facing stitched over zipper tape by hand
30.	Close-up showing placement of hook and eye (wrong side)
31.	Right side of completed zipper at neckline
32.	Medium range shot of entire zipper
33.	Medium range shot of completed dress - back view

OUTDOOR PLAY EQUIPMENT

Slide No.	Description
1.	(Title slide) Outdoor Play Equipment
2.	Long range shot of playground featuring commercial equipment
3.	Long range shot of playground featuring homemade equipment
4.	(Title slide) Climbing Equipment
5.	Jungle gym
6.	Dome-shaped jungle gym, or monkey climb
7.	Variplay house-gym, or outdoor gym-house
8.	Three-way ladder
9.	Play gym, or toddler's climber
10.	Playground in use - children playing on equipment
11.	(Title slide) Swings and Seesaws
12.	Swing set with makeshift rope swing and traveling rings
13.	Swing set with rubber seat belts, horizontal bar, and seesaw
14.	Swing set with metal seats and a porch-type swing
15.	Rocking seesaw
16.	Spring-mounted seesaw
17.	Swingate
18.	Candy-cane poles and three-point chain suspension - rocket swings
19.	(Title slide) Slides
20.	Free-standing slide
21.	Close-up of reinforced metal slide
22.	Large slide with humps
23.	(Title slide) Sand Boxes
24.	Close-up of sand box with wooden sides
25.	Sand box with lid
26.	Sand box with sun shade
27.	(Title slide) Swimming Pools
28.	Inflatable rubber pool
29.	Metal pool
30.	(Title slide) Makeshift Equipment
31.	Painted wooden packing crates, barrels, and boards
32.	Rope ladder
33.	Rubber tire swing
34.	Tractor tire sand box
35.	Hay bales for climbing
36.	Home built climbing equipment - made from pipes

GUIDELINES FOR AUDIOVISUAL INSTRUCTION IN HOME ECONOMICS

by

GROVALYNN GOULD

Home Economics Education

Oklahoma State University

1967-1968

TABLE OF CONTENTS

INTRODUCTION

The rapid expansion of knowledge has produced so much information that teaching becomes more difficult each year if only the traditional methods of classroom instruction are used. Through the well-planned use of audiovisual materials teachers can impart much more information in less time than with traditional methods. Research studies have shown that information learned through audiovisual presentations is likely to be remembered longer because it is understood, not just memorized. Teachers who use every available means for better communication with students have discovered a satisfaction that results from successful learning experiences of students.

Audiovisual materials should not be viewed as a threat to teachers. They are not designed to replace the teacher, but to make the job of the teacher easier and more effective. Audiovisual instruction can take some of the drudgery out of teaching and free the teacher to work with individual students and ideas--to do the things machines will never be able to do. The value of any audiovisual material actually depends on the ability of the teacher. There is no substitute for a teacher's ability to select and organize learning experiences. It is the teacher who must plan, select, and prepare appropriate audiovisual materials for accelerating learning or for producing desired changes in student behavior.

Educators foresee that audiovisual materials will be used more and more in the future in all types of classrooms, from the kindergarten

through graduate school and in classes for adults. Even today students can sit at a carrel in a library, dormitory, or classroom and through a dial access system dial any one of several lectures or televised lessons to watch and listen to at their convenience.

The role of the teacher is gradually changing. According to Lee,[1]

> The growing stress upon "learning how to learn" means that the elemental ingredient in education is not discrete fact but underlying principle, not details of information but insight into intellectual processes. This means that the teacher must function more as a catalyst, as one whose prime obligation is the stimulation of the urge to inquire and the oversight of individual, independent study.

Rather than a dispenser of facts, the teacher becomes a coordinator and provider of materials for learning. A creative teacher finds many opportunities for using audiovisual materials to enhance her instruction; but the unimaginative teacher may be afraid to use them, for they may interrupt her rigid lesson plans.

Since one of the most important goals of education in the future will be to prepare the student to continue learning on his own, students will more frequently be encouraged to use self-instructional teaching materials. Slides, 8mm motion pictures, and programed instruction may be particularly useful in this area if they are planned with the idea of individual instruction in mind.

Basic ideas and generalizations taught in home economics classes lend themselves to many types of audiovisual instruction. The medium which is best for teaching developmental tasks in child care may not be

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[1]Gordon C. Lee, "The Changing Role of the Teacher," The Changing American School, Sixty-fifth Yearbook of the National Society for the Study of Education, Part II (Chicago: The University of Chicago Press, 1966), p. 24.

the best for teaching how to put in a zipper; but through careful planning and knowledge of the possibilities, one or more methods may be found which will make it possible to do a more effective job of teaching each of these ideas. Very often optimum learning occurs when a variety of instructional materials are used. The job of the home economics teachers is planning--planning with students, parents, and others what should be included in the courses she teaches; planning when to incorporate audiovisual materials; and planning which medium will be most effective for teaching a particular concept.

Another decision the teacher has to make is whether to buy her audiovisual materials or to develop her own. There are advantages and disadvantages to both. As the number of audiovisual techniques and materials on the market increases, it will become even more important for the teacher to become familiar with them and to be selective in using only those which will in her estimation contribute to a desired change in the behavior of the student.

Many values result from the use of audiovisual materials in teaching. They capture the attention of students and stimulate a high degree of interest. Educators readily recognize the relationship of interest to learning. Audiovisual materials assist in developing understandings; therefore, basic ideas should be remembered longer and wider application of the ideas made in new situations. Audiovisual materials provide experiences which are otherwise unavailable to students in the classroom. They also motivate students to want to learn more about the subject presented. The providing of audiovisual materials is not enough; the materials must be planned for and used by teachers with specific educational objectives in mind.

There is no magic formula to tell teachers when to use or make available for student use audiovisual materials, but there are some general guidelines to use in determining whether a particular material is suitable:

1. Does it present a concept that contributes to the attainment of an objective for the unit?
2. Is it focused on one idea or limited to a small number of related ideas?
3. Is it appropriate for the age level with which it is being used?
4. Is it well-organized, technically good, and esthetically pleasing?
5. Are the facts portrayed true and up-to-date?
6. Is it powerful enough to attract and hold the attention of the audience?
7. Is the point worth making?
8. Is this the most effective way that the concept can be presented?

It is often desirable to use more than one medium to communicate an idea. Studies have shown that when a variety of appropriate audiovisual materials are used under proper conditions learning of a high quality results. Teachers are hoping to produce desired changes in behavior in each of three domains--the cognitive, the affective, and the psychomotor. A combination of media may be necessary to produce the desired behavior changes.

The four media which will be considered in this project are 8mm motion pictures, slides, overhead transparencies, and programed instruction. These four were chosen for several reasons. They are likely to be widely used in the near future. Slides and 8mm motion pictures may be used either with groups or for individual instruction. Programed

instruction will become increasingly important as the emphasis on individual instruction intensifies. More overhead projectors have been purchased by schools during the past few years than any other piece of audiovisual equipment, so this is a medium that is readily available to a great number of teachers.

Technology has produced projectors and teaching machines which are easy to handle, relatively inexpensive, and simple to operate. Materials are comparatively easy to develop and a teacher should be able to produce her own if she has access to the necessary equipment. Commercial materials are available in each of the four media listed above in the field of home economics, so a teacher who lacks the equipment necessary to produce her own or prefers to use commercially developed materials may do so.

Samples of audiovisual materials will be developed in three areas--foods, child care, and clothing. These three areas were chosen because they are the areas which are common to gainful employment and homemaking programs in Oklahoma. The principles of audiovisual instruction are the same, however, and could be used to develop materials in any of the areas taught in home economics.

The materials developed in this project are designed to acquaint home ecnomics teachers with four types of audiovisual instruction and to present ideas for teachers to use in developing and using these media to contribute to more effective teaching. Guidelines will be given for developing materials; however, specific directions for operating the equipment will not be given. These directions vary for different brands of equipment and can best be learned by reading the instructions which come with the equipment. A later section will deal with availability

and selection of commercially prepared materials in home economics.

SLIDES

Slides are one of the most versatile of all projected materials. They may be either purchased or teacher-made. They may be used with large groups, small groups, or by individual students. They may be updated at any time by changing only a few slides. The series may be rearranged, shortened, or lengthened for use with different groups at different times. Slides may be used to direct attention of the entire class to a particular idea. They also may be made available for students to view again later for clarification of a point or for review.

Slides may be used to present a demonstration so that all of the students have a front row seat. Each slide may be kept on the screen as long as necessary. Natural color is readily obtainable for teaching concepts in which color is essential for understanding a concept. Slide projectors are relatively inexpensive and may be easily moved from place to place. They are easily operated by teacher or students. They may be used in a semi-darkened room as long as there is no direct light on the screen.

Use of Slides in Teaching Home Economics

Subjects particularly suited to slide presentation are those where the showing of actual movement is not necessary but where a visual presentation is more desirable than audio alone. Slides may bring experiences into the classroom which students would not have otherwise, such as the operation of a large food service establishement in a

metropolitan area, or the mass production of clothing in a garment factory. A slide series may be used to motivate students or to introduce a course or a unit within a course.

Slides are particularly helpful in differentiating between the purposes of the two aspects of the home economics program--homemaking and gainful employment. Slides may also be effective in showing a step-by-step process which needs to be viewed or discussed one step at a time, such as making a bound buttonhole or a pie crust. The same slides may be used for evaluation purposes. After the teacher has rearranged the slides, she might ask students to determine which steps are out-of-order. She might show only a few of the slides and ask students to determine which steps were omitted.

There are, of course, disadvantages to using slides in the classroom. While the expense is not prohibitive, slides are not inexpensive teaching materials. The room must be partially darkened unless the slides are being used by an individual in a small area. A teacher who happens to drop a slide series on the floor must use valuable time in picking up each individual slide, arranging the slides in order, and turning them so that they will not appear sideways, upside down, or backwards on the screen. If the slides are to be used over a long period of time, an adequate amount of proper storage is essential. Storage of slides so that they are accessible for student use may also present problems.

In order for slides to be most effectively used in the teaching-learning process, the teacher has to plan their use long in advance--at the time she sets up her objectives. Slides should not be used for the sole purpose of entertainment or simply to fill up extra time. They

should be used for teaching. A teacher should not use a series of slides which she has not previewed. Students may have more difficulty "unlearning" something they have seen, than in learning the information initially.

The class should be prepared for the slide series before it is shown. They should be told what they will see, anything they should be particularly aware of, and what they should expect to gain from viewing the series. Students remember better if they actively participate while they are watching the slides. This may be done through discussion while the slides are being shown or by having the students fill out some kind of question-answer sheet. If the room is not too dark, students might be asked to take notes for a later discussion. A follow-up of the slide series is necessary in order for the knowledge gained to become permanent. The follow-up can take any form desired by the teacher, but it should be planned prior to the showing of the series.

Necessary equipment in good working order should be available at the time it is needed. If the teacher does not know how to operate the projector, she should have a projectionist on hand to operate it for her. Interest may be lost while waiting for a long-overdue projectionist or for the teacher to read the instruction book. Generally, however, a slide projector is simple enough for both teacher and students to operate. Slides should be arranged in proper order and positioned correctly to prevent loss of time and breaks in the attention span when slides are not as they should be on the screen.

If students are to use the slide series individually, the purpose of the series must be explained to students before they are ready to use it. They should be taught how to operate the projector, and how to

take proper care of the slides. Slides should be as self-explanatory as possible, particularly if they are to be used by individual students. A written script or list of steps should be provided for the student to read as he looks at the slides.

The following section contains information on developing a slide series for use in teaching home economics. A later section will be devoted to selecting commercially prepared slides for use in teaching.

Development of a Slide Series

If you have access to a 35mm camera, you can develop your own slide series. The major advantage to developing your own is that you can have exactly what you want. You may up-date it whenever necessary, and it will be at your disposal whenever you wish to use it.

The first step in developing a slide series is to determine the purpose of the series. Exactly what is it that you want to teach? What do you want the students to know or to be able to do after their exposure to the series? Will the series be used with high school students, junior high students, or adults? It will be impossible to develop a series of slides that teaches unless you have established clearly in your mind your objectives--what the students should learn, or what behavior changes are desired.

The next step is to make a rough outline of the story you wish to tell with the slides. Break it down into its major parts and put them into a reasonable sequence for presentation. What are the major points you wish to convey to the students? What are sub-points that are necessary for the understanding of the major points? Do you wish to include enrichment material to keep interest high?

Only after the outline has been drafted are you ready to decide what pictures you will need to tell the story. If your slide content is well-planned before the shots are made, it will eliminate unnecessary duplication of effort and greatly reduce the expense connected with production of a slide series. It is usually easier to use index cards in this stage of development so that cards may be added, deleted, or rearranged whenever necessary. Some people prefer 3 x 5 cards; others prefer 5 x 8. One card should be made for each slide that is desired. The card should contain the following information:

1. title of the slide--particular emphasis the photographer should focus on,
2. rough sketch of what should be on the finished slide,
3. technical information such as long, medium, or close-up shot--particular angle,
4. narration for the slide, and
5. a number representing position of the slide in the series.

This information is important even if you are planning to take your own pictures, because you may forget your good ideas when you get ready to make thirty or forty slides.

You may wish to make an inexpensive storyboard to help you with your arrangement of cards prior to making the slides for a slide series. A storyboard is a large sheet of poster board, separated into sections containing pockets made from strips of poster board and masking tape. Each section is numbered so that cards containing information about the slides may be arranged in order and rearranged whenever necessary until the series is completed. As each slide is made, a red X may be placed on the card. When an X appears on all the cards of the series, the

cards may be removed, the sequence checked and revised if necessary. From the cards the script for the series may be quickly written.

The actual slides will probably vary some from the original plan, so the script may have to be adjusted for this. Edit your slides. Remove the ones which are too light, too dark, or out of focus, and those which fail to emphasize the major point. You may see where additional slides are needed for clarity. After all these adjustments are made, you are ready to try out the completed series. Do not be afraid to rearrange, reshoot, add, or delete pictures. The series should be neither too long nor too short. It should be long enough to tell the story effectively, but short enough to hold the interest and attention of the student. If possible, have someone else view the series and get their reactions. After working with something for a long time, a person may fail to see weak points that may be quite obvious to a newcomer.

After the series is complete and the script is written, you are ready to decide how to handle the narration. There are at least three possibilities. First, and simplest, you may read the script as the slides are being shown. You may prefer to use a tape recorder and record the script on a magnetic tape. Then as the slides are shown, you may play back the tape, moving the slides so that the script will correspond to the slide that is being shown.

Another alternative, which requires technical information and special equipment, is to add synchronized sound by means of a programmer. A programmer is a special device used with a tape recorder and a projector. First the narration is recorded on a magnetic tape. Magnetic impulses are then placed on the tape. The programmer is connected to both slide projector and tape recorder. During the playback the

impulse automatically causes the slide to change as soon as the narration for it is completed. Use of the programmer or the tape recorder allows background music to be added whenever desired. The important thing though, no matter which of the three methods of narration is used, is to synchronize the narration with the appropriate slide. Most important of all, the narration should help to convey the message that you had as your objective in the beginning.

Photography.--If you are the photographer, all the experience you can get with the camera will be to your advantage. Become familiar with your camera. Learn what it can do for you. Try to understand how it works because this understanding will allow you to take better pictures.

First of all you must decide what kind of film to use. Do you need colored film or can the point be made just as well with the less expensive black-and-white film? Are you going to take your pictures indoors or outdoors? What kind of light will be available? Pictures can be made under a great variety of conditions but the right kind of film for the conditions must be used. Some color films are made to be used in daylight while others are designed for use in artificial light, such as flood light, flash bulb light, and other types of incandescent light.

Time of day will affect lighting, particularly with color film. Learn to use a light meter, and check the lighting frequently. The lighting should be kept constant, particularly with color film, so that all of your pictures will be the same color. The best times of the day for taking colored slides are midmorning and midafternoon. Time of day and amount of light outside will affect your indoor pictures, also.

Be sure you have the subject in focus. The entire slide may not

be in focus, particularly if your depth of field is great, but it is absolutely essential for the center of interest to be in focus. Movement of the subject or the camera may cause the slide to be out of focus. If you have trouble holding the camera steady try using a tripod whenever possible. Consider the angle of the shot. Your center of interest is more likely to be in focus if you hold the camera at a 90^{o} angle to the subject than if you shoot from one end of it to the other.

Try to photograph the subject so it will fill most of the areas of the slide. This may be done by getting as close as possible to the subject. If you are photographing a series on clothing construction process, close-ups are essential in order for students to see the details. If people are in the picture, try to get them to appear as natural as possible.

Consider your background. Pictures of children on a playground at a nursery school will be ineffective if a group of overflowing trashcans in the alley appear in the background. Whether your background is light or dark will affect the appearance of the finished picture. The subject may be made to stand out more by using a darker background. If you are taking small objects, a large sheet of paper or a fabric lying on a table or fastened to a bulletin board will make an attractive background and will help focus attention on the subject. The color of the background should harmonize with the color of the object, and the background should not be so bold or noticeable as to detract attention from the primary object.

It is generally a good idea to bracket your pictures. Bracketing means taking at least three exposures. One should be taken at the setting which you have decided upon with your light meter. Another should

be taken 1/2 stop above (or slightly underexposed) and the other should be taken 1/2 stop below (or slightly overexposed). If this procedure is followed you should get at least one slide with the best possible lighting. Do not be afraid to take a number of exposures. Professional photographers sometimes take hundreds of exposures in order to get five or six slides that they will use. After you become familiar with the camera and the light meter, you will know how to predict the available light and the action of the camera so that fewer exposures will be required. However, it is always more efficient to make several exposures while you have the shot set up, than to go back and set it up again. It may be a shot that can be made only at that time. For example, in a construction process you may need a shot of the armhole before the sleeve is set in. After the sleeve is attached, it will be impossible to get another shot of the empty armhole, so you had better get all you need the first time.

You may wish to shoot the picture from several angles, because the one that looks best to you through the lens may not be the one that will show up best on the screen. Also, you may need to show a particular shot from more than one angle for clarity. Check the index card to make sure the emphasis you are focusing on is the one intended.

Title slides make your series look more professional and also help to convey the message. There are several ways to make attractive title slides. If you are fortunate enough to have a knack for lettering, you may letter the titles on a large sheet of newsprint or construction paper with felt pens and then photograph them. Colored chalk on black construction paper is also effective. If you are less artistic, you may use a child's magnetic board and plastic letters with magnets. A

colored sheet of construction paper may be placed on the board to give a particular effect, or the board may be used just as it is. The letters may be different colors or all the same color. A very faint line may be penciled on the paper to line up the letters.

Another method of lettering is with pin back letters on a cork board. Plastic pin back letters may be purchased in black and white. If desired, they may be spray-painted with different colors. These letters will stay in place better than the magnetic ones, but they are harder to line up because of the various placement of the pins on the backs of the letters. Inexpensive cardboard letters may also be used. Some letters are made with adhesive on the back so they will stay in place, yet they can be pulled off easily and used several times.

An important point to remember in photographing title slides is that the camera should be held at a 90^{o} angle to the flat surface containing the letters. If the letters are lying on a table, the photographer should bend over them so that he is photographing them from directly above. An easy way to get the right angle is to hang the board or paper containing the letters on the wall. Then the pictures may be taken with the photographer standing up straight. This, of course, would be the case if a blackboard or bulletin board were used. Another convenient way is to place the paper or magnetic board on an easel. Just be sure to hold the camera so the angle is right for the slant of the easel.

Materials from books, magazines, charts, or other printed sources may be copied on a slide if your camera, with or without supplementary lenses, will take the close-up shots. The same criteria for lighting and angle would apply to copying as to making original slides. A tripod or copy stand should be used to hold the camera steady.

The slides in a series should be as self-explanatory as possible. Arrows, signs, or other symbols may be added to point out particular features. Be sure that any lettering used is clear and large enough to be read on the screen. Unless it is a close-up shot, lettering smaller than one inch cannot be read. The longer the shot, the larger the lettering must be. In using arrows or other symbols, consider proportion in regard to the center of interest, and be sure there is a pleasing color contrast.

It is rewarding to be able to use a slide series that you have made yourself. Remember, the first one is the most difficult. After the first one, the others come easy. Slides which are properly cared for will last a long time. A well-planned series may be used many times throughout the years, so it is worth all the time, energy, and money spent in developing it. If the series does the job of accomplishing an objective the students will profit immeasurably from using it.

OVERHEAD TRANSPARENCIES

The overhead projector is rapidly becoming one of the most widely used teaching tools in the United States. "A study conducted by the Bureau of Social Science Research showed that in 238 sampled school districts the number of overhead projectors increased 175.5% from 1961-1964. This was higher than for any other piece of audiovisual equipment."[1] Ninety-five percent of the sixty-six home economics teachers participating in this study indicated on the questionnaire that an overhead projector was available for use in their classrooms.

Teaching with an overhead projector is not really a new idea. The armed forces have used it since World War II in training military personnel. The earliest projectors, however, were very expensive and were heavy and inconvenient to use. This slowed their acceptance in educational institutions. During the past few years relatively inexpensive projectors have been developed which are light-weight and may be easily carried from room to room. Various processes for making transparencies have also been developed and improved during these years. Teachers who have used the overhead system in their teaching have discovered that it has a unique contribution to make to teaching and that its use is limited only by the imagination of the teacher.

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[1] Raymond Wyman and Donald H. Frederickson, "The Feasibility of Distributing Locally Produced Overhead Projection Masters," Audiovisual Instruction, XII (April, 1967), 368.

Use of the Overhead System in Teaching Home Economics

The overhead system has many advantages. First of all, the teacher is not replaced even for a short time. During the showing of a film, or in taking a field trip, the teacher loses contact with students for a short time, but this is not the case with an overhead projector. Her presence is necessary to control the presentation of materials in this manner.

Not only is the teacher present, she is facing the class at all times. This allows her to watch the expressions of the students to determine when a point is unclear. She can also tell when the concept has been understood so that she can proceed to the next point. In this way the pace of presentation may be continually adjusted to the behavior of the students.

The teacher sees the projected material exactly as the students see it. She may wish to use a pencil or her finger as a pointer to emphasize certain points. The silhouette of the pointer will be projected on the screen and attention will be drawn to a particular item.

The overhead projector may be used with very large groups because the image can be made quite large by moving the projector further away from the screen. The projector is as simple to operate as an ordinary desk lamp. A transparency is simply placed on the stage and the switch is turned on. Student attention may be effectively controlled by turning the switch off and on. When the teacher wants attention directed to the screen, she turns the light on; when she wants the attention directed to herself, she simply turns the switch off. This can be done any number of times during a presentation. Whenever transparencies are changed, the switch should be turned off, so the student will see the

image only when it is ready for him.

Since the image may be seen on the screen even in a fully lighted classroom, it is possible for the students to take notes during the presentation. If a darker image is desired, the light nearest the screen may be turned off. It is the light that reflects on the screen that affects the image and not the light that is directed toward the students.

Use of the overhead projector saves teacher time. The results of an extensive experiment at the University of Texas showed a saving of 15 minutes of every 60-minute lecture period when transparencies were used.[2] Once transparencies are made, they may be used over and over. To conserve time spent in making transparencies teachers in a small geographic area might exchange transparencies.

A popular way to use the overhead is in place of a chalkboard. A device may be attached to some overhead projectors that will carry a roll of acetate. The teacher may write on the acetate with a grease pencil and roll it like a scroll. This gives her as much area as a blackboard affords, and sometimes even more. If several classes of the same subject are being taught, the writing may be left on the roll and used with all of the classes. This saves the time required to write it in each class. The material may be written on sheets of transparency film if no roll is available. It may be prepared before class or written during the class. Short test questions might be written on a transparency so that students would be able to see them all at once. Transparencies will not be erased accidentally, and they will not fade with

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[2]James W. Brown, Richard B. Lewis, and Fred F. Harcleroad, A-V Instruction Materials and Methods (New York: McGraw-Hill Book Company, 1964), p. 473.

the passage of time.

A wide variety of materials can be used with the overhead projector. Transparencies may be hand-made by the teacher, made by the teacher using commercial printed originals, or commercially prepared. Commercially prepared transparencies are usually quite expensive, but they will probably be very well executed. Commercial transparencies are not available for teaching every concept in home ecnomics, but a large number of new ones are appearing on the market each year.

Opaque objects may be placed on the stage of the projector. Any object with a recognizable silhouette may be easily identified. The distinction between various types of shears and scissors may be effectively shown this way. Different shapes cut from construction paper or cardboard could be used to demonstrate types of balance and proportion. Solid objects which are transparent may also be used. Clear plastic rulers are especially good for demonstrating measurements.

Transparencies for use with the overhead may be prepared without camera or other machinery. It is so simple that students may make their own transparencies if they so desire. Color may be achieved on transparencies by a number of processes which will be discussed in the next section. Simulation of motion in still pictures can also be projected.

When using the overhead, the teacher should arrange the room so that all students are able to see the entire screen. One of the best ways to assure this is to place the screen in the corner of the room and keep it as high as possible. In order to prevent keystoning (the spreading out of the image at the top of the screen), keep the projector squared up with the screen. Most overhead projectors may be easily

adjusted to prevent keystoning.

Students may not need as much preparation for the use of transparencies as they will for a slide series or a motion picture, because the teacher is there at all times to answer questions. The teacher should carefully plan the use of the transparencies in her teaching, though, and should use them only when they contribute to the understanding of a concept related to an objective of the course, or when they enhance the teaching-learning process. A home economics teacher can find many opportunities for using the overhead projector in her teaching. Since home economics draws material from a number of disciplines, no one textbook covers all of the material taught during a semester. Information in the field is constantly changing due to technological advancements; therefore, it is frequently necessary to up-date the information.

Much of the information presented in home economics courses is much more effective when visually presented. A group of transparencies might take the place of a demonstration, eliminating the need for the teacher to gather her students in a crowded area, such as around a table, cabinet, or sewing machine. For instance, drawings of various acceptable table settings may be put on transparencies, shown, and explained one at a time to the entire class as they are seated in a regular classroom.

Color charts may be effectively presented when the teacher has mastered the technique of getting color on transparencies and making overlays. Various effects of figured, striped, or solid color fabrics on different figure types can be effectively contrasted using transparencies.

Floor arrangements of house plans may be permanently drawn on transparencies. With the house-plan transparency on the stage of the projector, opaque cut-outs of furniture pieces may be placed on the transparency and arranged and rearranged in order to determine appropriate furniture arrangements. Imaginative teachers will be able to discover many different uses for the overhead system in teaching home economics.

Preparation of Transparencies

Even teachers who prefer commercial transparencies will find that there are times when they need custom-made transparencies to use with a particular class or in a particular situation. Five methods of making transparencies are frequently used. Each of the five will be discussed briefly, but no specific directions for operating the equipment will be given. Since each machine is slightly different, operating procedures may best be learned by reading the instruction manual that comes with the machine. The discussion of the methods will be followed by suggestions for planning the content of a visual and for mounting transparencies.

The simplest method of making transparencies is by hand. Lines may be placed directly on the transparency with grease pencils, felt-tipped pens, or nylon-tipped pens. A variety of tip shapes is available for achieving various widths of lines. Oil-base or water-base inks are suitable for hand-made transparencies, but for permanent lines, India ink is best. Water-base inks may be easily removed with a damp cloth, while oil-base and grease pencil marks may be removed with a solvent such as lighter fluid. Theoretically, the same sheet of film

may be used over and over again.

No machine is required for hand-made transparencies and the materials used are relatively inexpensive. Acetate sheets or reprocessed x-ray film may be used for hand-made transparencies. X-ray film is usually inexpensive especially when purchased in large quantities.

The hand-made transparency has several advantages. It is inexpensive in terms of materials. Since no machine is required, transparencies may be made at home as well as at school. They may be made on the spot with the entire class watching if desirable. For example, a teacher wishing to show the students how to fill in an application for a social security card might have the application blank affixed permanently to the transparency. She could then use a water-base pen to fill in the blanks as she explained each of them to the class. Some teachers use the hand-made method to try out an idea, and then re-do it later with a more professional-looking method. Hand-made transparencies are also simple for students to make.

There are a few disadvantages to hand-made transparencies. Unless done with permanent-type ink, they do not keep well. They may smear if they get wet or if grease pencil marks are rubbed against something. This may be partially prevented by placing a second sheet of acetate next to the markings and taping the two together.

Hand-made transparencies often lack the professional look which can be obtained by other processes. If the visual needed on the transparency is already drawn, it would be much more expensive in terms of time for a teacher to patiently trace it by hand than to use one of the other processes to make a copy of it. Methods of obtaining color and professional-looking lettering on hand-made transparencies will be

discussed later in this section.

The most common of the processed transparencies are those made by the heat transfer method. This method is sometimes called the thermal-copy or dry-heat method. The heat transfer method produces a transparency from an original in a matter of seconds. A sheet of specially prepared film is placed on the original and the two sheets are passed through a copy machine. Heat passes through the film to the original. The lines on the original absorb heat and cause an image to form on the film within a few seconds.

The original may be either opaque or translucent, however, it may be no thicker than a sheet of paper. Hand-made or commercial originals (sometimes called printed originals) may be used. If hand-made originals are used, the lines must be made with an ebony or no. 2 lead pencil, India ink, or a carbon ribbon on the typewriter. Ball point or nylon-tipped pens will not reproduce.

The type film used in heat processes is more expensive than the film used for hand-made transparencies; however, flimsy, one-time transparencies may be made from the clear plastic that comes on dry cleaning or from plastic sandwich bags. The type film used will determine the color of the finished transparency. Film is available which will produce a black line on a clear transparency, a colored line on a clear transparency, a black line on a colored transparency, or a colored line on an opaque transparency. In the latter case, all that appears on the screen is the colored line. Various companies which produce the film will gladly provide catalogs describing the types available. Very unusual effects may be achieved through experimentation with the different types of film which may be used in the heat transfer process.

One of the biggest advantages of the heat transfer process is that it is very fast. Some of the materials are relatively inexpensive, and almost any original on either opaque or translucent paper may be copied. Materials can be handled in ordinary light and stored indefinitely without deterioration of the film.

The heat transfer process does not destroy the original, so as many transparencies as are desirable may be made from it. Many commercial companies produce printed originals which may be purchased at a relatively low cost and copied by this process to give professional transparencies in seconds.

One of the limitations of the heat transfer process is that colored pictures and colored lettering will not reproduce at all. Only high contrast lines are possible--no intermediate tones may be achieved. Only single sheets may be copied, and there can be no change in the size of the material as is possible with photographic processes.

A third method of making transparencies is with the diazo process. The diazo process is more complicated than the heat transfer process because it requires an intermediate step and a transparent or translucent master.

If the master to be used in the diazo process is hand-made, India ink should be used on tracing paper. The image should be as opaque as possible, so pencil marks are not appropriate for this. The light passes through the film and leaves color on the film only where the lines are. If the original is on opaque paper, the heat transfer or photographic process may be used to make a transparent master and the transparent master used for the diazo transparency.

After the master has been prepared, a sheet of diazo film of the

desired color is backed with an aluminum reflector sheet and placed on the master. The sheets are exposed to ultraviolet light in a special exposure unit. The film is then transferred to a container of ammonia vapor for development. When the image has appeared fully, the film is removed and is immediately ready for projection.

The greatest advantage to using the diazo process is the beautiful color which it will produce. Many colors are available and this process, when carefully executed, can produce professional-looking colored transparencies. Only one color can be obtained on one sheet of film, though, and different colors must be added by the use of overlays, which will be discussed later.

Diazo film is quickly destroyed if it is exposed to sunlight or ammonia fumes, so it must be kept sealed in a package in a cool place. The diazo process is more complicated than the heat process, and the smell of the ammonia fumes is undesirable to some people. A machine is now available, however, which eliminates the ammonia jar, and developes the film within one machine.

Transparencies may also be developed by photographic processes. Photographic processes are used to copy material from books, magazines, newspapers or other sources. Colored materials may be copied; however, the colored material always comes out black and white on the transparency. Transparencies may be made from glossy photographs, and intermediate tones are possible with the photographic process.

The photographic process requires a light rather than a heat exposure, and both a negative and a positive film are used. A sheet of sensitized paper is placed on the material to be copied. Then both are placed in a special box and exposed to light for a specified amount of

time. Then they are removed and the sensitized paper is placed on a special translucent paper to produce a positive. These two sheets are run through a developing tank and peeled apart. After the positive is dry, it may be used as a transparency or as a master for the diazo process.

Photographic processing has the advantage of an enlarging-reducing system which allows one to change the size of material as it is copied. This is especially desirable for lettering, because ordinary typing or print used in newspapers and magazines may be too small to be seen when projected on the screen. The reducing system may make possible projection of a visual which originally was larger than the 10 x 10 inch stage of the ordinary overhead projector.

Photographic processing is a wet process requiring fresh developer at a specified temperature for good results. Since the transparency is wet, it must be allowed to dry before use. The negative paper must be carefully handled and stored because it is extremely light-sensitive. Compared to the other methods of producing transparencies, photographic processes are expensive.

Another method for producing transparencies is through the color-lift process, a method of putting a full-color picture on a transparency. The ink is simply transferred from a clay-coated magazine page to a sheet of transparent film. Only pictures on a clay-coated page may be lifted; however, most magazines which contain full-color pictures are clay-coated. To determine whether a picture can be lifted, moisten your finger and rub it on the margin of the page. If a white residue appears, the picture will lift.

The page containing the picture is laminated to the film with a dry

mount press or by hand. The important thing is getting it laminated to the entire page without leaving any bubbles. Bubbles prevent the ink from adhering in those spots, and will produce a clear spot on the transparency. After the picture is laminated, the paper is soaked loose from the ink in a pan of lukewarm water. The ink remains laminated to the film. The white residue is gently rubbed off with a cotton ball and the material is dried.

The inked surface may be protected by spraying it with clear plastic or by attaching it to a sheet of acetate. The image may then be projected on the screen. This process affords full color that is otherwise obtainable only through full-color photography, but it destroys the original picture, so only those materials that are expendable should be used. Before deciding to do a color-lift the teacher should consider how it will be used in teaching.

Planning the visual.--A teacher-designed visual may be drawn either on a transparency or on a master to be processed. If you are making a master, make it on tracing paper so that it may be used with either the diazo or the heat transfer process. When much time and effort is put into a master, it should be preserved for future use, or for sharing with another teacher. Before making a master you may wish to experiment with scraps of film and different types of pencils, ink, and other materials to determine which works best with your machine.

Whether you are making a hand-made transparency or a master, there are several guidelines to follow in developing a visual. First, be sure the topic selected is one that can be visualized. If it consists of only printed material, it would probably be better to duplicate it and give each student a copy. Transparencies should present ideas which

will be remembered longer or understood more clearly if they are visualized. The visual should support a point that the teacher is making rather than attempt to teach an entire lesson.

A good visual should have unity; only one idea should be presented. The visual should contain only primary information, and a minimum of that. The teacher can supply additional primary and secondary information as she discusses the point. A transparency should never contain information which has no bearing on the point being made.

The transparency should have a design that attracts attention and captures interest. Do not include too many details. If every section of the visual competes for attention, students may fail to see the major point. If several points need to be visualized, break them down into several transparencies and use them in succession.

The visual material on the transparency should cover no more than 7½ x 9½ inches so that it will fit the regular commercial frames. The layout should be horizontal rather than vertical because this is more pleasing to the eye. It is usually easier to get good space relationships on a visual if a rough sketch is made and placed under the sheet on which the visual is being traced. Be sure to plan for margins and include some empty spaces for a pleasing effect. Lined or squared paper may also be placed under the transparency for guidance. Lined paper is especially helpful in getting lettering straight.

An artistic teacher may have no difficulty in the free-hand drawing of her ideas on a transparency. A less artistic teacher may use children's coloring books, comic books, or mail-order catalogs to find line drawings that are simple to trace. Pictures from these sources might be adapted for use in home economics classes. Some companies sell

booklets containing pictures which were designed for the specific purpose of being traced and used on transparencies, but these books are much more expensive than the sources mentioned above.

Simplicity is the key to success in planning the written material on a transparency. The ideal presentation contains a clear visual idea with no more than three or four words. An average student may be able to retain a maximum of ten lines of text with each line possessing no more than six or seven words, but this visual may not be as effective as one containing only four words.

For the artistic teacher, lettering is no problem. For others, however, several aids are available. One of the simplest is press-on letters which are available on plastic sheets. You select the letter you need, position it on the transparency, and rub it with a ball-point pen. After the sheet is removed, the letter is adhered to the transparency. A letter cannot be removed after it is rubbed on, so be careful to get it in the right place the first time.

Lettering sets are available for making professional-looking letters in a variety of styles and sizes. The equipment is not difficult to use, and the ink is usually permanent. Professional results may also be obtained by using a nylon-tipped pen with a stencil.

Size of lettering is very important. Letters smaller than 1/4 inch should not be used on a transparency. A regular typewritten message is smaller than 1/4 inch and cannot be seen from the back of the room. A good rule to follow is to use letters which are 1 inch high for each thirty feet of viewing distance. Thicker lines are easier to see than thin lines, but they should not be too thick. Lines which are too thick are as difficult to read as those which are too thin.

Do not put the lines of lettering too close together. The distance between lines should be one and one-half times the letter height. Manuscript is easier to read than cursive. Italics are difficult to read on the screen. Words which are underlined are more difficult to read than those which are not.

Lettering should be placed horizontally rather than vertically on the transparency. The caption should be at the top of the transparency rather than at the bottom because visibility is poorest at the bottom of a transparency. Related ideas should be grouped or connected so that the relation is readily apparent. Be sure that the students are able to read all the information that is printed on the transparency. It should be simple and clear enough that it can be read accurately, easily, and quickly from every seat in the room.

You may wish to use color on your visual to attract attention. If only one spot is colored, attention will focus on that spot instantly. If there are too many colored spots, they will compete for attention and students will be distracted from the main idea. Color may be used to show differentiation, as between water and land. You can focus attention on one word by putting a block of color behind it. There are many reasons for using color; but when color is added, it adds to the cost of your transparency, so know what you want the color to achieve.

Color may be achieved on transparencies by one of several methods. As previously mentioned, colored film may be used with heat transfer and diazo processes to produce a one-color transparency. More than one color may be obtained on a transparency with these processes if multicolor developers are used. A special type film is exposed in the exposure unit much the same as for other types, but the exposed film is

not put into the ammonia jar. Instead, each line of text or each part of a picture is rubbed gently with a cotton swab which has been saturated with a special solution. A different solution is used for each color. If the work is done carefully, many colors may be used on the same transparency.

The simplest way to get color on a hand-made transparency is to color the spaces with a felt-tipped pen. Color obtained in this manner is not uniform because light and dark streaks result where the strokes overlap. Another method of obtaining color on hand-made transparencies is with adhesive-backed color sheets. These are self-adhering sheets of colored acetate which may be cut into any shape or size and pressed directly onto the transparency. Sheets are available in red, green, blue, and yellow. These cut-outs give bright, uniform color but may have a tendency to peel off after the transparency has been used several times.

Various types of colored tapes are available. These are very handy in making charts and graphs with colored lines. Tapes are also available printed with arrows and other symbols, so you can cut off the symbol you need and press it onto your transparency. Since these materials also tend to peel off after a period of time, they are not satisfactory for permanent transparencies.

Various colors may be obtained on a transparency by the overlay method. Each overlay is made with a different colored film, and when they are lying one over the other several colors appear on the screen at the same time. A very effective presentation of the color chart may be obtained by using a base transparency and an overlay both containing only the three primary colors. These colors are arranged in such a way

that the secondary colors appear when the overlay is correctly positioned over the base transparency.

Polarization may be used to produce simulated motion on a transparency. Specially produced polarized materials are now available which are relatively simple to use with the overhead. These materials have been used to show the pumping action of the heart, liquid flowing through a pipeline, and other actions. It is possible to have a caption or word black out and reappear of its own accord for emphasis. This motion is accomplished with two polarized filters. One of these is built into the transparency and the other is rotated in the light path. Home economics teachers may be able to discover uses for this system in their teaching.

After your visual is designed, it is a good idea to sit in the back of the room and view it from there. Remember, a transparency should be used for teaching and not for testing eye-sight. Everyone must be able to see it and read the printed words if it is to be effective.

Mounting.--Transparencies are easier to handle if they are mounted in a frame. A frame is simply a rigid piece of cardboard with a "window" cut out to accommodate the visual portion of the transparency. The frame contributes to the effectiveness of the visual by cutting out extra light around the edges. Framed transparencies are easier to file because they are rigid. The frame offers space for labeling the transparency. In handling mounted transparencies, fingerprints get on the frame, rather than on the film itself.

Although frames may be hand-made from cardboard or manila folders, commercial frames are readily available and relatively inexpensive. As

a rule, the only time a hand-made frame is economical is when an unusual opening is desired.

The transparency is attached to the underside of the frame with tape. Before taping, be sure that the material is centered and that the baseline of the transparency is parallel to the inside edge of the frame. Usually two small pieces of tape will hold the material in place temporarily while it is being correctly positioned. For a temporary mount, a piece of tape across opposite corners is sufficient, but for a permanent mount the transparency should be taped to the frame on all four sides.

Progressive disclosure of the content of the visual is made possible through various types of mounting. The simplest method of progressive disclosure is accomplished by simply placing a sheet of paper over the transparency and sliding it down, exposing one bit of information at a time. This sliding method of disclosure may be more efficient, however, if plastic tracks are mounted on each side of the frame so that a mask can be moved up or down as desired. The most useful mask may be a plastic sheet which appears opaque and completely cuts out the light on the screen. The teacher can see through the plastic when the projector is turned on, however, and this allows her to see what will appear next on the screen.

Pieces of opaque paper may be used to block out sections of a transparency if you want the students to see only one particular section at a time. For instance, you might have small drawings of four different period chairs on the same transparency. The students would be allowed to see only the chair which the teacher was discussing at a particular time. This could be accomplished with masks cut to the

appropriate size and hinged to the edges of the frame. In this way, sections could be exposed one at a time to focus attention where you wanted it. Inexpensive hinges are available which will stick to the edge of the transparency and may be stapled to the frame. There are numerous ways to cut and hinge masks to reveal only certain portions of the visual.

Hinges are also used with overlays. Overlays are transparencies which are hinged to the frame so that they may be laid over the base transparency to add more information. For example, in teaching parts of the machine, the base transparency might be a drawing of the sewing machine. One overlay might have the names of the parts of the machine with arrows pointing to the location of the part. Another overlay might have numbers indicating the parts so that it could be used for evaluation purposes. In this case, you would use only one of the overlays at a time. Each would be used for a particular purpose.

At times, several overlays may be used on the same base transparency. In this case, they must be hinged to the frame so that they may be laid over the base transparency in the proper sequence. Overlays may be attached to all four sides of the transparency, or all may be attached to the same side. The design of the overhead projector you plan to use may dictate whether you can use overlays on all four sides. Some projectors may have the back side blocked so that only three sides may be used. If you attach them all to the same side, you must always use them in the same sequence. This would be an advantage if you were showing a process that always occurred in the same sequence. Attaching overlays in this way would prevent your getting one step out of sequence. If you desire to use different sequences, attach the overlays

to the four sides.

Whenever overlays are to be used, reference marks must be placed on the base transparency so that the overlay transparencies may be aligned perfectly. There should be reference marks (usually a + mark) in opposite corners of the base transparency. Reference marks are also put on the overlays, so that they may be aligned at the time they are mounted. These marks appear on printed originals which were designed for overlays, but for hand-made materials, the teacher will have to supply her own. Use of reference marks makes it easier to use overlays and guarantees that they will "fit" the base transparency.

Paper folders have been designed to protect transparencies. Each transparency should be placed in a paper folder by itself, to prevent scratching the film or rubbing off the image. These inexpensive folders add to the use of the transparency.

This section has dealt with the use of the overhead system in home economics and with the development of transparencies. A later section will contain guidelines for selection and use of commercial transparencies.

PROGRAMED INSTRUCTION

Programed instruction is gradually being incorporated into the classroom. A survey of current research in education reveals a large number of studies dealing with programed instruction. Sufficient research has already been completed to provide an answer to the question, "Will programed instruction teach?" The answer is that it will. The problem facing teachers today is that of determining which subject matter needs to be programed and getting it programed for the students to use.

Some authorities separate programed instruction from other audio-visual devices on the ground that the other devices are only a means of presenting whatever material happens to be fed into them while programed instruction is a system of teaching based on a psychological approach to learning. Programed instruction is included in this study of audio-visual instruction because of a belief that it will be even more frequently used in classrooms in the near future, and because of a belief in its potential as an effective method of instruction.

Use of Programed Instruction in Home Economics

An awareness of the philosophy underlying programed instruction and a recognition of the major types of programs should assist home economics teachers in making an effective use of programed instruction. Programed instruction originated in the laboratory of the experimental psychologist. In 1924, Dr. Sidney L. Pressey invented a small testing

machine which would score a multiple choice examination automatically at the time the answer-button was pushed. Pressey perceived that by making a slight change in the machine it could be used as a teaching device to remove some of the routine drill of teaching. With this thought in mind, Pressey developed the first teaching machine. This idea has expanded until today programed instruction is available in many forms--from the very simplest mimeographed booklet to the most complex electronic wonders imaginable, utilizing slides, motion pictures, tape recordings, talking typewriters, and various types of computers.

Programed instruction is based on the learning theory called reinforcement conditioning. In reinforcement conditioning the organism is presented with a stimulus; then the organism tries a response. If the response is a correct one, the organism receives positive reinforcement. If he is aware that it was correct, he receives primary reinforcement.

In programed instruction the stimulus is presented in the form of a bit of information and a question. The student responds by answering the question. The correct answer to the question is given so that the student may receive immediate reinforcement by checking his answers.

As the number of students constantly increases, classes grow larger and less time is available for individual instruction. Programed instruction has been offered as a partial solution to this problem because the effect of using a program is like that of having a private tutor. There is a constant exchange between program and student, and the program insists that a student understand a point before he is given the next point. Yet programs are designed so that students can work completely through them without any assistance from the teacher.

Several other advantages to using programs are recognized; however,

not all of the advantages are evident in all situations. One advantage is that a program is self-paced. Since each student may proceed at his own rate through the program, no slow student is left behind by the class, yet no gifted student is held back.

Another advantage is that reinforcement of correct responses is immediate. The student does not have to wait twenty-four hours or several weeks for his paper to be corrected. If he makes an error, he not only knows he has made an error, but he is immediately told what the correct response should have been. The teacher may check the student's work at any time, so evaluation is not limited to separate testing.

In some cases, topics may be covered in less time by students using programed instruction than by students taught by traditional methods. Teacher time is always saved when an effective program is used because a program requires no teacher supervision; however, programed instruction was not designed to replace teachers. It is only one of a number of teaching devices at the command of teachers to help them do their work faster and more effectively. This will leave more time for counseling, inspiring, stimulating, and challenging the students.

Programed instruction requires active participation on the part of the learner as opposed to the covert activity usually found in traditional classrooms. One of the newer types of programing consists of simply inserting questions into textbook material at specified intervals to assist the student in concentrating on the material he is reading.

Perhaps one of the greatest advantages of programed instruction is that a program has infinite patience. A teacher may get tired of repeating the same information a number of times so that she can be sure everyone understands it, but a student can go through a program any

number of times without the program "getting tired." This is particularly beneficial to the slow learner who needs repetition in order to learn.

There are two major types of programs in use today. The most common terms used in denoting them are linear and branching. Each type has advantages and disadvantages, and neither could be designated as the "best" type. Either type may be developed for use with or without a teaching machine. Anytime a teaching machine is used, remember that it is the content of the program that is important. The machine is only a "holder" for the program.

Dr. B. F. Skinner and Dr. Sidney Pressey are the men who are closely associated with the linear type of programing. Linear programs consist of a series of small frames which are parts of a larger sequence of material. Each frame consists of a small bit of information and a question to which the student responds. Responses may be checked for reinforcement.

The theory behind the linear type is that students learn from correct responses which are immediately reinforced. Therefore, each item to be learned must be drawn from the student as a response and students must not be allowed to make errors. Because of the desire for a low error rate the amount of information presented in each frame is very small and cues are given to help students arrive at the correct response.

A linear program is designed in such a way that each student goes through every frame. Since one objective of the programer is to prevent students from making errors, the program must be written so that even the slowest student makes very few errors. A bright student may be

bored with a linear program because he has to work through the same number of frames which are necessary for the slow students.

Original promoters of the linear type of programing believed that the only acceptable mode of response was the constructed response (i.e., fill in the blank). This type response is believed best for teaching information which must be memorized and recalled by the student. Information which needs only to be recognized by the student may be taught by means of multiple choice questions; and today multiple choice, true-false, and other types of questions are being incorporated into linear programs.

In summary, a linear program is characterized by small steps, constructed responses, and by the completion of every frame by every student.

The major characteristics of the branching program are large frames, multiple choice questions, and the provision of remedial frames, so that not all students go through all frames. The person responsible for the branching technique is Dr. Norman Crowder. The branching program is presented in a teaching machine or in the form of a scrambled book. One or more paragraphs of information are presented. Then a multiple choice question is given with two to four alternatives. The student selects an alternative which sends him to the next bit of information for which he is ready. Each alternative leads to a different place in the program. If the answer selected is correct, the student is told that he is correct and new information is presented. If the answer selected is incorrect, the student is given additional information that should help him to see why his answer is incorrect. He is then given another question with a set of alternatives from which to

choose, or told to return to the original page and select another alternative. The student who is quick to grasp the information moves rapidly through the program, reading only the main frames. The slower student who selects incorrect alternatives in the main frames will be guided through branching frames containing remedial information until he, too, is able to make the correct choices.

At the present time there is insufficient evidence to establish that one type of program is definitely better than the other for a particular type of teaching; however, linear programing is sometimes considered better for teaching factual information while branching may be employed to teach problem-solving and the development of attitudes.

Other types of programs are described in the vast amount of literature which has appeared on programed instruction during the past decade. Some authorities are advocating that it is the perrogative of each programer to develop his own type of program. The material to be taught may dictate the format and all sorts of combinations may be used. Linear and branching types may be studied as a point of departure. After the characteristics of these types are understood, other types may be considered. The main idea is that each program should be designed to teach a specific objective. The program should present new information, offer a response element, and provide reinforcement. It should be self-explanatory so that the student can move through it without any assistance from a teacher.

Home economics teachers are beginning to find uses for programed instruction in their subject matter field. They may be able to find commercial programs which accomplish their objectives or they may have to develop programs of their own. The factual information that is

taught in home economics, such as that taught in nutrition and textile units, could easily be adapted to linear programing. Home economics teachers are also concerned with developing attitudes, such as a favorable attitude toward work or an enjoyment of children. Branching might be employed for this. Both types have been used to teach skills. Even though it takes practice to master a skill the process may be explained and taught through programed instruction.

Since there is no longer a question about whether students learn through programed instruction, the teacher's job has become one of determining which objectives can be most effectively accomplished through use of a program.

Development of Programed Instruction

Now that you have some basic knowledge of programed instruction, you may wish to write a program of your own for your students. Programed instruction begins where the student is and guides him into new information which is needed to accomplish a specified objective. In order for you to know where to begin you must describe your students and attempt to determine what knowledge, skills, and attitudes they presently have in their repertoire. At what level do they read? What words will they understand? In order for them to profit from the program, they must be able to read and understand the words and symbols used in the program. How much previous knowledge do they have about the subject area in which you are writing? Can you assume they know the definitions of the technical terms you plan to use or will these terms have to be defined in the program?

The next step in writing a program is to determine the objective.

What should the student know or be able to do upon completion of the program? This objective should be stated in behavioral terms. A behavioral objective specifies the performance which will be accepted as evidence that the student has achieved the objective. For example, if your objective was to teach four methods of transferring pattern markings to fabric and their uses the behavioral objective might be stated, "The student will be able to demonstrate his knowledge of four methods of transferring pattern markings by listing them and giving an example of where each method should be used."

After you have selected an objective and stated it in behavioral terms, you are ready to determine what information is necessary for the student to accomplish the objective. Analyze the information and decide how it can be broken down into small segments to be learned one at a time through programed instruction. This breakdown will probably be done in the form of an outline. Be sure that everything you want the student to learn is included in the outline.

When the outline is completed, the information in the outline is put into a flow chart. A flow chart is a schematic drawing indicating the sequence for presenting the material. There are two popular sequences for programs. One is a whole-part-whole method, where you first tell about the whole, then tell about the parts, and then return again to the whole. For example, in teaching about the four natural fibers, you might list the four natural fibers: wool, silk, cotton, and linen. Then you might tell the source of each of the four fibers. Next you might list characteristics of each of the fibers. This might be followed by uses of each fiber. In the whole-part-whole method, the source of each fiber would be given before the characteristics of any of them

were given. In the last frames, you would bring the four together again by reminding the students that wool, silk, cotton, and linen were the four natural fibers.

The second possible sequence for the information might be to give all the information about the first part before you begin the second part. In other words, in the above example the source, characteristics, and uses of wool would be given before silk was introduced. Then the source, characteristics, and uses of silk would be given before introducing the next fiber, and so on until all the information had been given.

The nature of the subject matter and the characteristics of the students determine the sequence. If one of the above suggestions does not seem to "fit" your situation, try one of your own. It is important to arrive at a sequence which is meaningful to the students.

After the sequence has been determined and the flow chart developed, you are ready to decide which type of programing you wish to use. Will linear or branching be best for your subject matter or do you wish to attempt some other type? After you decide on the type, you are ready to write the frames. A frame consists of three parts--the stimulus, the response element, and the reinforcement.

If you choose the linear type each frame will consist of one small item of information. A question will be asked (perhaps in the form of true-false, fill in the blank, or multiple choice) and instructions for answering will be given. Perhaps you will use cues early in the program to help the student make the correct response. One popular type of cue is to underline the word needed in the response. These cues should be gradually faded (reduced) until in the later frames the

student is able to arrive at the response without a cue.

The blank to be filled in should come toward the end of the frame. As soon as the student has filled in the blank, he sees no reason to continue reading, so do not present new information following the blank.

The correct answer must be given so that a student may check his answer. The answers must be placed on the page so that the student may cover them while he is reading the frame and responding. This may be accomplished by having the student turn the page after each frame and having the answer to page 1 at the left hand side of page 2. It may also be accomplished by having the answers at the right hand side of the page and asking the student to use a paper shield to cover them as he proceeds through the program.

If you choose to write a branching program the frames will be much larger and will contain more information. You will have two types of frames--main frames and branching frames. New information will be presented in the main frames. The branching frames will contain only remedial information. New information cannot be presented in branching frames because not all of the students will read the branching frames.

The main frames should be written first. Give the student two or three short paragraphs of information and then ask a question which requires him to use as much of the information as possible in arriving at an answer. List two to four alternatives from which the student may select his answer. One of the alternatives will be the correct choice. The others will be choices at which a student might logically arrive if he failed to read the information, misunderstood the message, or lacked the necessary background information. A page number should be listed after each alternative to direct the student to his next frame.

Remedial frames must be written for each incorrect alternative. These frames contain enough corrective information to get the student ready for the next frame. This may be accomplished by either sending the student back to the original frame to make another choice, or by giving him a similar choice to make and then sending him on to the next frame. More than one remedial frame may be needed, and as many may be used as are necessary.

Since writing a branching program is more difficult than writing a linear one, most beginning programers prefer to develop a linear program first. Before either type is attempted it would be wise to study a few programs which have already been written to get ideas about format.

Some authorities recommend writing the criterion (or test) frames first. Criterion frames are frames designed to see whether or not the student has learned the information. These frames may be included in the last part of the program or used as a separate evaluation device to help the student determine whether he has learned the material presented in the program.

If you wish to try your own type of programing, go right ahead. Just remember to include the three essentials in your frames--a stimulus, a response element, and reinforcement. From there, you are on your own.

After the frames are written they should be tried out with a student. It is a good idea to try the program with a student who is like the students with whom the materials will be used. Sit down with him and let him go through the program. Watch his face to see when he hesitates or when he does not make his response quickly. Try to get him to talk to you and tell you what he is thinking and where he is having

difficulty. Sometimes in a branching program, the question is made out, and then several students are asked for answers. This is the way the programer decides on the alternatives he uses.

After the program is tried with one student, it should be revised and tried with several others; then revised again before it is put in final form. One major difference between programed material and textbooks is that programs have been tested with students and revised before they are printed. One rule to follow is to revise until ninety percent of the students make correct responses ninety percent of the time.

In order to determine how much a student has learned from a program you may wish to develop a pre-post test. This is usually a comprehensive multiple choice test over the material presented in the program. If the program is designed with primarily constructed responses rather than multiple choice items, you may prefer to use fill in the blank questions on the test. It is usually advisable to make the questions on the test similar to the form of the frames in the program. The questions on the post-test are the same or very similar to those on the pre-test. The pre-test is given before the program and the post-test is given after the program has been completed. The pre-test score is subtracted from the post-test score and the difference represents the amount of gain.

Writing a program and getting it ready for student use is not a simple matter. However, it may be easier to train teachers, who already know the subject matter and the students, to write the programs than to train programers in the subject matter. If a teacher writes her own programs, she can design them to teach exactly what she wants the students to learn.

Some authorities believe that a teacher who plans and writes a program of her own improves her teaching considerably. This is because she learns to clearly define her objectives and to state them in such a way that their achievement can be measured. She also gains experience in planning a workable sequence for presentation of the information through which the objective is accomplished.

Samples of a linear and a branching program are attached. You may wish to refer to them for further clarification of these two types of programing.

8MM MOTION PICTURES

One of the fastest growing innovations in educational instruction is the use of 8mm motion pictures. Nearly 750,000 8mm film projectors are sold annually in the United States and more than five million are now in use. More than 1,600 silent film cartridges are now available commercially and more are being developed. Although only a very small number of the teachers in this study have access to 8mm equipment, this section was included as a possible step toward future planning of audio-visual instruction in the home economics classroom.

The 8mm motion pictures have inherent characteristics which make them adaptable for use in the classroom, particularly with small groups of students or for individual instruction. Educators believe that 8mm motion pictures will not replace the 16mm motion pictures that they have used for many years. The 8mm motion pictures will be used in an entirely different way and will supplement the "professional" motion pictures. Professional 16mm motion pictures will probably continue to be used to "bring the world into the classroom" so that students may have experiences via the movie screen that they could not have otherwise, while 8mm motion pictures will be used for actual teaching.

Regular 8mm film is the "amateur" film regularly used in home movie cameras. The invasion of 8mm motion pictures into the classroom gained impetus with the invention of super 8 film. Super 8 film is the same size as regular 8mm film, but the sprocket holes have been reduced in size so that the space used for the image will be larger. The larger

image causes the picture to appear brighter on the screen. Super 8 films are sometimes referred to as single-concept films, continuous loop films, or film loops.

Uses of 8mm Motion Pictures in Home Economics

There are many uses for 8mm film in the home economics classroom. Physical development of children can be effectively illustrated on motion picture film. As children of different ages walk, run, and play, differences in their development are quite apparent. Demonstrations of new equipment may be effectively presented on film, so that a student can view it whenever he has a question about how to operate the equipment. This should save a tremendous amount of teacher time, and should encourage independence on the part of the student.

When used in independent study, 8mm motion pictures have some of the same advantages as programed instruction. As a matter of fact, 8mm motion pictures may be incorporated into programed instruction materials. The 8mm motion pictures have the capacity for repeating the information endlessly without becoming tired, as a teacher might if she were repeating information. The information will be presented in a logical sequence, with the objective apparent to the teacher and the student. Instruction will be reduced to its essential parts, with the teacher and/or textbooks providing enrichment. The student will be learning to study and to evaluate his progress independently if the materials are presented in such a way as to encourage this.

Since the films are short, each film is limited to the presentation of one main idea. This idea should be one for which portrayal of motion is essential. The film may show a demonstration, illustrate an idea

which has been presented orally in class, or present a single skill. For example, frosting a cake might be effectively demonstrated on 8mm film. The student could review the film as many times as he needed to in order to learn the motions used in frosting a cake.

There are a great many advantages to using 8mm film in the classroom. Perhaps one of the greatest is that it can be encased in inexpensive plastic cartridges and used in a rear view projector. Cartridges make the films easy to use and convenient to store. The cartridge system eliminates threading a projector and rewinding the film. The cartridge is simply inserted into the projector and the machine is turned on. The operation is so simple that it may be used effortlessly by anyone. Some projectors automatically cut off when the film is completed, and the film is then ready for the next showing. Most projectors allow the film to be stopped at any time so that a single picture may be discussed or explained. The cartridge eliminates dust and the danger of scratching or breaking the film because it is not handled directly.

The films used in the cartridges range from thirty seconds to four minutes in length. Two or more cartridges may be used if more time is required. Film cartridges are available commercially in a number of subject matter areas including home economics. They may also be developed by the teacher. Information about the development of films will be given later in this section.

Another advantage which 8mm has over 16mm film is that 8mm film and projectors are usually significantly lower in cost. Four minute 8mm silent cartridges cost from eight to twenty dollars. Film, processing, and cartridging of teacher-made 8mm motion pictures will cost

about five or six dollars per cartridge. Cameras range from $30 to $160 and projectors may be purchased for $80 to $160. Equipment for using sound on 8mm motion pictures will be more expensive, but should still be only about one-third the cost of 16mm motion pictures with sound. Because of the relatively low cost, 8mm projectors can be placed permanently in a large number of classrooms.

Some entire courses have been presented by using only 8mm films, but reactions of students to viewing thirty minutes of film each day over a long period of time were unfavorable. It may be more effective to use the multi-media approach, where many different methods are employed to present ideas in the most effective way possible.

An 8mm projector may be placed in a carrel or in a corner of the classroom where individual students or small groups can use it frequently. If a rear view projector is used, the room can be fully lighted. A good 8mm film should be bright enough to show to a class of twenty to twenty-five students if the room can be sufficiently darkened.

Development of 8mm Motion Pictures

Any teacher with an 8mm motion picture camera can develop her own motion pictures. As in other teacher-made materials, the motion pictures may be custom-tailored to fit the particular needs of the class. After the film is made it can be put into a cartridge if desired.

Before deciding to make a motion picture there are several questions to consider. First of all, what is the idea that is to be taught? Is it important? Does it contribute to an overall objective of the course? Next, is it an idea that requires motion for effective presentation or would a less expensive still picture do the job? Are

commercial materials already available in this area which would do the job as well or better than your motion picture would?

After deciding to make a motion picture, many of the steps are the same as for a slide series. An outline must be developed which includes all the material to be covered in the motion picture. The content may be broken down into small steps, written on cards, and used with the story board as described in the section on development of a slide series. The card should describe the content of the scene, the type of shot (long, medium, or close-up) and the angle. Careful planning avoids the wasting of time and film by shooting scenes that will not be used.

Title slides may be added to the motion picture if desired. Any of the lettering ideas listed in the slide series section may be used. Remember that proper focus and exposure are essential here, too. A tripod can be very helpful in holding a motion picture camera still.

Scenes may be shot in any order and then edited into the desired sequence. After all scenes are shot, you are ready to edit the film. To edit the original film, cut it apart and divide it into appropriate scenes. Arrange the scenes in sequence according to the script. Insert titles and subtitles in appropriate places, and splice the pieces of film together. Splicing is a very simple operation which can be quickly learned by reading the instructions which come with the equipment used for splicing. After splicing, try out the film. Some scenes may need to be shortened, eliminated, or rephotographed.

Evaluate the film to determine whether it satisfies the original purposes and determine what changes, if any, need to be made. When you are satisfied with the film, you may use it with a regular 8mm or super

8 projector, or you may send it to a commercial company to have it put into a cartridge for one or two dollars. It is then ready for students to use.

The first 8mm motion pictures used in the classroom were silent, but gradually methods of adding sound are being developed. Of course, the teacher may provide her own narration by simply explaining the film as she shows it, especially if she is using it with a group or an entire class of students.

If sound is necessary for the films used in independent study, the sound must be a part of the film. This can be accomplished by having a magnetic strip added to the film after it is developed, and then recording the sound much the same as with a tape recorder. Technicians are now experimenting with optical sound (the kind used on 16mm film) for 8mm film, and this should be available soon. Sound adds to the cost, but it may also add to the effectiveness of the presentation.

A motion picture camera may also be used to record field trip experiences. If expense prevents each class from taking a field trip, perhaps the same information could be presented in an 8mm motion picture. Motion picture cameras may also be used to record the progress of a student in developing a skill.

Some teachers will enjoy producing these 8mm films for their classes. Others may prefer to use commercial films. The important consideration is that the film contribute to the overall educational objectives of the course, and that material presented lends itself to presentation in motion picture format.

COMMERCIALLY PREPARED MATERIALS

Several companies specialize in producing materials for teachers. Commercially prepared materials are usually more expensive than teacher-made materials, but the work generally has a more professional appearance. Before deciding to prepare materials for your classes, check to see whether it is already available commercially. It is desirable to review commercial materials before they are purchased, whenever possible, to determine quality and whether they meet the objectives for your classes. Commercially prepared materials may be interspersed with teacher-made materials for an instructional package tailored for a particular situation.

Following is a list of visual materials which are available commercially in the areas of foods, child care, and clothing. There is a scarcity of home economics materials for use with the media included in this study. New materials are appearing on the market every year, so it would be wise to check frequently to see what new materials are available. Only the title of the material and the address of the producer are given. Additional information, such as cost, content, time required, and whether the materials have been tested, may be obtained from the producer.

Slides

CUTTING TO FIT AND FITTING
HOW TO MAKE A DRESS WITH THE QUALITY LOOK
HOW TO MAKE A SIMPLE SKIRT AND BLOUSE
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