



Training films in teaching large quantity equipment
by Louise Jannette Christianson Oman

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE in Home Economics

Montana State University

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Abstract:

In our rapidly growing and changing society educational methods and requirements must, of necessity, expand and improve. Audio-visual aids are one area that seems to meet this challenge. In this study the use of films as a part of the training which institutional management or predietetic majors receive in the use of large quantity-equipment was explored.

Because no training films, to suit our purposes, were available, a film and script depicting the operation and cleaning of a food slicing machine were developed as a part of the study. Junior and senior students enrolled in the predietetic curriculum were utilized to determine the effectiveness and shortcomings of the film.

Due to the limited sample no definite conclusions can be made. Results seem to indicate, however, that the film succeeded in demonstrating the fundamental principles in the operation of the food slicing machine but follow-up interest or experience is necessary for successful use.

The recommendations for future studies are to use a larger sample for more definite results, place more emphasis on safety in future films and to explore the use of training films in teaching some phases of large quantity cookery.

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Signature Louise Jannette Omas

Date July 8, 1970

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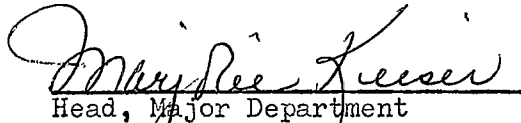
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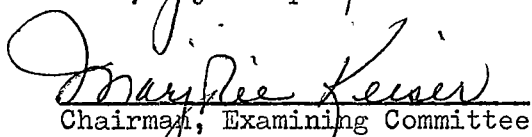
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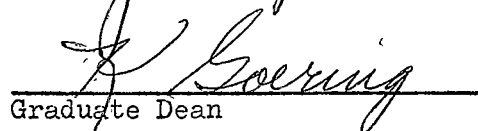
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ABSTRACT

In our rapidly growing and changing society educational methods and requirements must, of necessity, expand and improve. Audio-visual aids are one area that seems to meet this challenge. In this study the use of films as a part of the training which institutional management or predietetic majors receive in the use of large quantity equipment was explored.

Because no training films, to suit our purposes, were available, a film and script depicting the operation and cleaning of a food slicing machine were developed as a part of the study. Junior and senior students enrolled in the predietetic curriculum were utilized to determine the effectiveness and shortcomings of the film.

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CHAPTER I

INTRODUCTION

Importance of the Study

The sum of human knowledge and the complexity of human problems are perpetually increasing. Therefore, every generation must overhaul its educational methods if time is to be found for what is new (1).

This statement made approximately fifty years ago by Bertrand Russell is even more pertinent today as it is estimated that knowledge doubles every twenty years (2). Time available for teaching, for learning experiences in the classroom, has remained relatively static. American educators, therefore, have been striving to discover and develop new and more efficient methods of increasing pupil learning. The results have been many technological advances in teaching methods in recent years. One area in which we have seen almost revolutionary progress is in the audio-visual field, particularly in filmed instruction. Home Economists are becoming increasingly aware of possibilities in the area of films as evidenced by the current articles in professional journals, films available on a purchase or loan basis, and research topics of advanced degree studies.

This increase in knowledge is found in the area of food service as in other fields. An important part of the dietetic and food service majors training has been the experience they receive in the use of institutional equipment. So important that sections of text

books are devoted to it, costly institutional equipment laboratories are established to serve this purpose, expensive and awkward field trips are undertaken, and/or countless hours in actual food service facilities are devoted to this phase of the student training. In teaching institutional equipment, changes appear past due. It is difficult to maintain an up-to-date learning situation. Modifications or improvements of traditional equipment and changing preparation techniques due to the use of processed foods make traditional equipment and preparation methods obsolete.

In most situations students are exposed to institutional equipment through field trips and actual working experiences in food service facilities. This approach is time consuming. It is also difficult to arrange for exposure to the many different pieces of institutional equipment even if the school is located in a metropolitan area where many equipment manufacturers and food service institutions are available. For those in isolated areas the only resource is the equipment installed in local food service facilities. This does not give the student a true picture of equipment available.

Purpose of the Study

Audio-visual aids are currently being used successfully in such fields as Dentistry, Nursing, Safety and Nutrition. The effective use of these films as a training device has led to the consideration of its use in institutional equipment courses.

A search for a source of such films to use in the course, Equipment: Household and Institutional, at Montana State University was unsuccessful. The purpose of this study then, was to prepare such a film and to test its effectiveness. This motion picture would be used for imparting essential information in the operation and maintenance of a piece of institutional equipment. The successful use of this film as a substitute for actual experience could result in the establishment of an audio-visual laboratory to be used in conjunction with institutional equipment and large quantity cooking classes.

Hypothesis

A program of instruction utilizing motion pictures concerning a meaningful topic, efficiently organized and presented can be used in lieu of actual experience. It is hypothesized that pre-dietetic and institutional management majors can learn the operation of food service equipment through the use of Training or Use and Care films.

CHAPTER II

REVIEW OF LITERATURE

Introduction

In the training of predietetic and institutional management majors many laboratory hours are devoted to the operation or use and care of institutional equipment.

If filmed material can be accepted as a laboratory experience, it will be reasonable to advocate that the laboratory can be brought to the class via the cinematic medium, in contrast to the tradition that the class go to the laboratory. In fact, it may be desirable eventually to abandon the use of the term 'laboratory' in the context of an instructional methodology. (3).

This study is limited to those aspects of motion picture development which relate to incorporating films in a learning experience.

Motion Pictures

Historical Development

As early as 1860 Sir John Herschel made a daring prediction in Photographic news: "What I have to propose may seem to you like a dream . . . It is representation of scenes in action by photography" (4).

The first attempt, however, to make pictures move was the result of a bet by Govenor Stanford of California that a galloping horse, at some moment in his stride, had all four feet off the ground. Because the action was too fast for the eye to catch, Stanford engaged a photographer E. J. Muybridge to help settle the wager (4, 5, 6). Al-

though the first attempt was unsuccessful, he finally succeeded in 1877 in making a set of synchronized still photographs, each taken a split second apart, showing a horse moving at a gallop. Although he continued to perfect his technique, Muybridge never progressed beyond his battery of still cameras. Nevertheless he deserves the title often given to him, "Father of Cinematography" (4).

While Muybridge was working in the United States, Etienne Jules Marey was investigating ways and means of photographing the locomotion of man and animals in France. He was troubled by the fact that in Muybridge's work, each successive photograph was taken by a separate camera from a fresh viewpoint or angle so the series did not capture the action as it would be seen through the eyes of the observer unless he was moving, walking or running, beside the moving object. Marey wanted a succession of pictures taken from a single point and this could only be accomplished by devising a camera that could take the required succession of pictures (4).

In 1882, Marey mounted a large round photographic plate behind a single lens so the plate revolved to permit a succession of twelve individual exposures. This camera, called a gun camera because of its obvious shape, was named "Chronotograph." With his camera Marey photographed the movements of animals and humans, the flight of birds, the beating of a heart (4). At this same time, Thomas A. Edison was also perfecting an action camera. At this point, the heavy bulky plates or the unsatisfactory paper base were the fundamental weakness in the

action camera (4, 5). This was solved when Goodwin and Eastman developed the flexible celluloid base upon which a photographic emulsion could be placed (7).

Another problem was a method for adequate viewing by groups of people. Work on the projection of motion pictures before groups of people was pursued in both America and Europe. In attempting to credit the development of the motion picture projector to any one man or team of men, contradictions arise. Names figuring prominently in the development of the motion picture include Woodville, Latham, Thomas Armat and Francis Jenkins in America; Paul in England; Oscar Messter and the Sladanowsky brothers in Germany; and the Lumiere brothers in France. Public demonstrations before scientific groups or invited audiences were given by Latham, Jenkins, Armat and the Lumiere brothers in 1895 (4). Edison seemed hesitant to perfect a moving picture projector beyond the early Kinetoscope for individual viewing. He bowed to the inevitable, however, and collaborated at the last moment with Thomas Armat on the "Vitascope" motion picture projector. Further perfections were made by the Lumiere brothers, Louis and Auguste and, on December 28, 1895 they gave a public performance of motion pictures to which admission was charged. Some writers credit this as a first. After this first public demonstration Louis Lumiere is said to have termed the motion picture a scientific curiosity with no commercial value (4). Other pioneers, men of vision in developing motion pictures were aware of its great educational significance, not merely the

famous form of entertainment it has become (8). Thomas A. Edison never ceased to dream that the motion picture's contribution would be to education (9).

Once the means of taking and projecting pictures of motion was accomplished the work of adding sound began in earnest. Thomas A. Edison is quoted as saying:

In the year 1887, the idea occurred to me that it was possible to devise an instrument which would do for the eye what the phonograph does for the ear, and that by a combination of the two, all motion and sound could be recorded and reproduced simultaneously (10).

The first sound reproducing equipment was an awkward system of ropes and pulleys. The operator achieved approximate synchronization between sound and picture by manipulating the ropes and the projector speed control. The advent of electronic amplification provided a solution to sound with motion pictures (4).

Use:

Beginning -- Although the origin of motion pictures was educational in nature, its major impetus was as a commercial entertainment medium. It was this commercial medium that perfected techniques first for music then screen dialogue. By the middle 1930's, safety acetate film stock, 16 mm projectors and 16 mm sound equipment were all available, making way for the use of 16 mm sound films in home, school, church and business (4).

During World War II -- At this time, the United States was faced with the monumental task of turning out a fighting force of millions

of men in a relatively short period of time. The job was to teach more men more proficiencies and incomparably more difficult proficiencies than had ever in previous history been called for and of doing it faster (4, 7, 8, 10, 11).

The result of this premium on speed was the development of a bewildering range and variety of new modes of inculcating specialized disciplines - modes in their collective purport can only be summed up as AudioVisual (11).

Hundreds of films were designed for use of the armed forces in training their men.

It was generally accepted in the armed services that trainees would learn more in less time and retain more of what they did learn for a longer period of time through visual aids (12).

The successful film experiences in training of the armed forces during World War II resulted in unprecedented interest immediately after the end of hostilities. Many men who had been trained in this manner understood and appreciated the values of motion pictures and encouraged educational organizations to use them in educational programs. As Charles F. Hoban Jr. said "During the war, educational films grew up" (13).

Educational Films

"Seeing is believing." "One picture is worth 10,000 words." If these common cliches we use so frequently are true, there should be much value in using motion pictures in an educational setting. During the 19th century through the discoveries and inventions of many people

from various nations, including Eastman and Edison in the United States, the projection of an image on a screen became a practical and useful device. The 20th century has seen refinements and improvements in projection equipment and materials (14).

Purpose

In education the teacher is communicating facts and ideas to the learner. His effectiveness may be determined by how well he communicates. The textbook and lecture method is devoted to the interpretation of data. Students grasp and understand the interpretation of data through outlining, memorizing and cramming. Books have the advantage of being small, easily portable, can be used in classrooms, library and at home, and include a great deal of knowledge in a small space. Textbooks, however, are often a dry and boring method of acquiring knowledge. Books have no visual impact other than still photographs or illustrations (15). The motion picture is the observation of a series of pictures projected on the screen. The movies show something and the audience observes what is shown (9). Hoban has said:

The three functions of movies are (a) to show what something looks like, (b) to show how something works (including how something is done), and (c) to show how something happens (9).

The basic value of films is their ability to increase the resemblance of the subject matter to reality and to make the learning experience memorable. Films also help compel attention, present meanings involving motion and can speed up or slow down actions, growth or processes. They can reduce or enlarge the actual size of objects and

present physical processes invisible to the naked eye (16).

Acceptance

The educational use of films was received eagerly. Teachers were receptive to this new medium. As a result, projected images have become commonplace features in classrooms throughout the nation.

Specialized catalogs of "educational" films have been available in England, France and America since the early 1900's (4).

The acceptance and demand for educational films has progressed at a rate faster than the production of such films. Many different people and professions are interested in their use. The scientist, educator, theologian, physician, industrialist and people in the entertainment world are anxious to utilize their values and assets (4).

Studies on the use of educational films seem to indicate that modern educators no longer regard movies as something extra with which they must cope or as an educational fad and frill but as a tool for learning which can be used wisely to increase the effectiveness of the teacher and to ease the teaching burden. Studies have found films increased classroom participation and voluntary related reading (17).

"The motion picture, effectively presented, can instruct, inform, impress, and on rare occasions even inspire " (10).

In the Toledo school system ten years ago, one teacher in ten was sold on the use of audio-visual materials, today one out of four. This compares favorably with the national average of one out of seven. Factors influencing the increase in film utilization in Toledo are:

the recognition of a need for up-to-date methods, easier to use audio-visual equipment, an audio-visual department in the school to keep films and equipment in good operating condition, audio-visual departments or local libraries which make films readily available and instruction of teachers in the use of audio-visual equipment either in a college course or by the school audio-visual department (18).

Effectiveness

Research studies in the early 1930's produced data on the effects of motion pictures on the learning of ideas, on the development of attitudes and to some degree, on children's sleep, conduct and morals. It was demonstrated that motion pictures are a powerful medium of education - "not must that kind of education cramped in a strait-jacket of encyclopedic fact-getting, but education that deals with ideas and action, people and purpose" (9)

Teaching conditions have changed and are continuing to change. Children today are born into a world of mass media, exposed daily to motion pictures, television, radio, comic strips, paperback books, illustrated magazines and many other media referred to as Audio-visual - materials that do not depend primarily upon reading to convey their meaning. These conditions almost inevitably cause learning, planned or unplanned, conscious or unconscious (19, 20).

Findings of a Princeton University study on Audio-visual communications reveal that vision reinforced by sound produced 85 per cent recall three hours later and 65 per cent, three days later as compared

to 72 per cent and 20 per cent with the use of visual aids alone (21).

Edgar Dale states:

People learn from films. The use of effective and appropriate films results in more learning in less time and better retention of what is learned. Films in combination with other instructional materials are better than either alone. Instructional films stimulate other learning activities. Films facilitate thinking and problem solving. Films are equivalent to a good instructor in communicating facts or demonstrating procedures (19).

The educational film has been defined as "the one which contributes to the achievement of desirable educational goals by making effective use of the motion picture as a medium of communication" (4). Information and ideas are the basic materials for the educational film. Imagination and creativity make films effective. Films are not textbooks with moving illustrations but an art form (22). The perpetual change of the physical field, the anticipation of the observer and the directive force of the sound effects are probably the three major advantages of the motion picture as a medium of communication (4).

In recent years improvements have been made in educational films in both the visual and sound aspects. The quality of photography of educational films has greatly improved and color is almost universal. The narration leads viewers to ask questions. Subject area of educational films is widening to include such areas as premarital pregnancy, drugs, race conflict and social problems (22).

It is obvious that of all the modern educational tools, the motion picture possesses qualities which rank it along with the printing press as one of man's greatest achievements in developing methods

of mass communications (4).

Findings of research seem to indicate the values derived from using educational films in class include:

1. Students do learn from films. They can learn factual information, motor skills and concepts. Films can facilitate attitude and behavior change.
2. Movies induce greater acquisition and longer retention of factual information. This is particularly true if the films are appropriately selected and effectively used.
3. Films stimulate interest in other learning activities, particularly voluntary reading.
4. Movies bring experts and multiple resources to the classroom. However, films are inanimate objects which preclude the two way flow of communications.
5. Students may develop the skill of problem solving by viewing well-produced films.
6. Motion pictures show vague inaccessible processes, materials, events and things and changes in time, speed and space. Films provide continuity of action, often exactly as it occurs in life, in ways which are difficult to duplicate especially through verbal media. Films make concepts real and overcome physical limitations.
7. Motion pictures give all members of a group the opportunity to share an experience and provide a close-up view for every student. Films provide "common" experiences and bridge background differences for members of the same group.
8. Movies get and hold attention of almost all students.
9. Movies provide objectivity in the study of a delicate or controversial subject.
10. Films provide for a direct contact of students with the realities of their social and physical environment.
11. Films provide integrated experience which vary from the concrete to the abstract.

12. Films are valuable for all age and ability groups, and can help overcome important intellectual barriers to learning.

13. Students like motion pictures. (7, 14, 20, 23).

Limitations in Use

Lack of equipment -- A survey conducted in 1967 of 1,609 teachers in school systems across the nation indicated that there are many instructional resources available for use in the classroom and that teachers are making them an integral part of the instructional process. The new developments in equipment are not generally available, but many teachers are definitely interested in them. The survey showed 92.3 per cent or 9 in 10 of the teachers had access to silent filmstrip projectors while 84.5 per cent or 8 in 10 had 16 mm motion picture projectors; 54.4 per cent or 6 in 10 had sound filmstrip projectors; 27.2 per cent or 3 in 10 had 8 mm motion picture projectors. The study showed 81.2 per cent of the teachers used the silent filmstrip projector and 74.3 per cent used the 16 mm motion picture projector; 43.9 per cent used the sound filmstrip projector; and 16 per cent used the 8 mm motion picture projector. Silent filmstrip projectors and phonographs were the most popular pieces of audio-visual equipment; approximately 8 in 10 teachers indicated that they used them (24).

Availability -- One of the reasons films are not widely used in education is that the films are difficult to procure (25). A survey, sponsored by the Educational Resources Agency in cooperation with the Audiovisual Education Association of California reported in 1968 that

79 per cent of the California teachers felt they were competent to choose and properly use instructional media and 86 per cent felt they could operate the equipment without much technical assistance. They did indicate, however, there was not enough instructional materials and many existing materials were not up-to-date. Motion pictures, overhead transparencies and programmed instruction materials were clearly favorites when choices for new materials were offered. This survey also indicated that teachers do not seem to be fully aware of some of the newer media. There might have been greater preference for the newer materials if teachers had opportunity to become familiar with them (26).

Many schools still lag far behind in the employment of films as a major instructional device. The film industry estimated that in 1956 business and industry spent more than seven times as much as did all schools and colleges for 16 mm film production, prints, equipment and distribution. Total expenditures of government agencies for films were also greater than those of education. The slow acceptance of audio-visual material by the schools seems to be a combination of inconvenience of utilization, perhaps a certain condescension and a general unawareness of sufficient research findings (7). Dr. Edgar Katzenback pointed out that public and private education cost fifty billion dollars in 1967. He estimated that the total investment for training for jobs in business and government in 1967 came to twenty-seven billion dollars. He went on to predict that by 1975 the cost of

training for government and private industry will be on a parity with the investment for education of our children. The figure generally accepted for education cost in 1975 is sixty-five billion dollars. That means spending for education will go up thirty per cent while that for industrial and government training will more than double. Audio-visuals and motion pictures will play a major roll in this growth (27).

Ten years ago about 7,700 motion pictures were produced for business, schools, government, churches and community agencies. The estimated output for 1968 was over 13,000. Film production went up an average of 5 per cent each year in the past decade. This does not include the films for television or theater showing (27).

Sources of educational films are many and varied. Manufacturing companies often produce films demonstrating their product to be used as a salesman tool and some as a public service. Examples of these include J. C. Penney, Sears, Brooklyn Union Gas Company, Durum Wheat Institute and others. The National Film Board of Canada has been producing and distributing films "in the national interest" since 1939 (28). Professional organizations such as the American Dietetic Association, the American Medical Association and the National Restaurant Association sponsor films to be used for instructional purposes and occupational guidance. Research topics in advanced degree studies reveal an increasing interest in educational films in many fields.

One new use of the motion picture is incorporating the film with

the textbook. A new textbook and film loop on Physics are closely integrated. The resulting book is shorter than a conventional text and much experimental descriptive work is referred to as "Cinette Number ____" (15).

The Department of Pharmacology, the School of Medicine and the College of Education at the University of Washington have developed short teaching films for self instruction in pharmacology. A self instruction program is prepared for each film produced called "Cinematic Self-Instruction (CSI)". This replaces the old laboratory which used dynamic models to illustrate factual and conceptual information (3).

The General Electric Company used motion pictures for industrial purposes before the turn of the century and brought out one of its first industrial public relations films as early as 1909. Early industrial films were produced for showing in theaters as part of entertainment programs (10). As early as 1915 many states were using motion pictures to tell of their attractions for business and tourists (4).

The airlines are prominent users of films. Airline reservation clerks, ticket counter employees, mechanics who service and maintain planes, flight crews, traffic control and navigation members are all given intensive training utilizing motion pictures. In addition, the airlines provide tour agencies and major shippers with films to promote air travel (27).

A helpful development in the educational use of films of government origin was the creation of the United States Film Service. This agency acts as a counseling and advisory body in both the production and distribution of government films (29).

The Communicable Disease Center, United States Department of Health, Education and Welfare/Public Health Service is active in producing and distributing films to state health departments and others who request them. Films are available for instructional aids in laboratory fields and for medical students as well as related fields including sanitation, safety and administration (30). NASA is another government agency producing and using motion picture films (27).

Cost -- Limitations governing both the making and the use of films include the prohibitive cost and the complexity of equipment and procedures. Films are expensive to buy or produce and are also perishable. Projection equipment is expensive and needs care. Teachers have difficulty securing a film when it is needed. These obstacles may vanish with the advent of relatively inexpensive films and easy-to-operate equipment. The equipment of tomorrow may be even easier to operate (4, 25). More and more films are being made by students and teachers. It has taken several years for equipment to reach this level of operational simplicity for teachers to feel secure enough with film making processes to encourage student activity and for students to reach a level of visual sophistication to realize how they can use films to express their ideas (31).

Training Films in Institutional Management and Related Areas -- Training films are available in the institutional management area. Equipment manufacturers, such as the Middleby-Marshall Oven Company, the Cory Corporation, Litton Industries and S. Blickman, Inc., sponsor films featuring their products to be used primarily as a tool of their salesmen.

Research or graduate study programs are frequently conducted on the utilization of films in some area of quantity food service education. One such study concerned the development of programmed instructional material for the food service area of job training in home economics. Sanitation, safety, personal hygiene, general nutrition, cookery terms, basic measurements and menu terms were the units programmed (32). Another study concerned the preparation and evaluation of a 35 mm color slide program in the operation of a flight-type dishwashing machine (33). The development and evaluation of audio-visual instructions for teaching untrained food service workers banquet service was the purpose of another graduate study (34).

Training films may be bought from sources such as the National Restaurant Association (35) and Learning Information, Inc. (36). Some titles available are: "The Angry Flame", which is concerned with fire prevention in food service establishments; "Protecting The Public", dealing with food protection and sanitation; "Work Smart - Stay Safe", pertaining to accident prevention and unsafe work habits in food service establishments (35); "Getting Along With Your Co-Workers";

"The Art of Table Setting"; "Serving the Meal Graciously"; and "The Complete Dishwasher" (36).

Training films are available on a free loan or rental basis from sources such as Association Films, Inc., Modern Talking Picture Service, Inc., National Sanitation Foundation, various state university film libraries, State Departments of Public Health, the American Institute of Baking, the U.S.D.A., and the American Hospital Association. Films available include "Controlling Costs with Portion Cut Meats," "Feel Free" pertaining to dishmachine operation, "Flying Saucers" concerning the selection and handling of china, "How Clean is Clean?" about mechanical dishwashing techniques, and "Here They Come" pertaining to cooking in steamers and steam jacketed kettles.

Institutional Equipment

Importance to the Curriculum

The food service industry is ranked as the nation's third largest industry (37). One reason for this growth is the increasing number of people eating meals away from home. Factors contributing to this growth are rising income levels, more travel for both business and pleasure, the greater number of housewives employed outside the home, the increasing number of patients, attendants and others who, of necessity, eat in hospitals or other institutions (2, 38).

There is a need, therefore, for trained food service personnel. A very important part of the dietetic and food service majors' training is the experience they receive in using institutional equipment.

Ability to use tools or equipment is an integral part of food preparation. Fear of equipment and lack of ability to use it properly are common difficulties with both inexperienced students and new employees . . . It is believed that guidance in the care and operation of equipment may promote better production of food, insure greater safety of individuals using equipment and may tend toward substantial saving in equipment expense . . . (39)

Methods of Teaching

If students are to develop an ability to select, operate and care for institutional equipment, various types of learning experiences are needed. It is more than the acquisition of factual information. Extensive experiences or practicums need to be provided. Training offered in this area varies with different schools.

University facilities -- Many colleges and universities provide experience using institutional equipment by having students work in the kitchens of the residence halls and the student union. Sometimes other food service facilities in the area, such as school lunch or hospitals, can also be incorporated. The advantages of this type of training include introducing students to many different layouts, numerous types of equipment and different types of service, and eliminating the expense of buying costly food service equipment by the Home Economics department. The disadvantage of this type of training is the difficulty of arranging students schedules to coincide with the operating schedules. Class enrollment often must be limited to the size of the operation and the amount of instruction time available. Each food service operation has conditions peculiar to that particular situation. Too much emphasis or time spent in one particular operation will not

give the student a variety of experiences and situations. Training should be provided in different food service operations.

Facilities available in schools, for large quantity food preparation classes differ considerably . . . It is desirable that initial instruction in the use and care of equipment be given to the class as a whole, with opportunity provided for individual students to show the extent of their understanding. This gives the instructor a chance to demonstrate, answer questions and eliminate points of confusion before students are subjected to the work situation . . . Effectiveness of this plan requires limiting the class enrollment according to space available and scheduling the class during low activity periods in the kitchen. With minor menu and schedule adjustments, services of a regular employee, sometimes, may be used to assist in the equipment demonstration (39).

Laboratory -- "A fully equipped large quantity laboratory requires a larger investment than many school officials feel justified in making" (39). Other plans have been suggested. In some cases the Home Economics department will maintain limited laboratory space and equipment. This is often used in the areas of research, demonstration and for graduate student as well as undergraduate institutional management training. Included in such a laboratory maybe a microwave oven, vertical cutter-mixer, large mixer, potentiometers, and humidity and temperature-recording equipment. The plan should provide for class demonstration of equipment operation and production techniques with sufficient space and basic equipment such as tables and utensils for individual work by students. Some experts believe this is too costly (40). Others point out that equipment styles are often changed and it is important to have the latest designs (41, 42). Success of this plan may depend upon satisfactory

arrangements being made with an equipment house for rental or loan of the additional equipment as needed (39).

Another approach has been the operation of institutional food services. At the University of Illinois there is a kitchen, tea room and cafeteria operated on a fairly small scale in the Home Economics building. It is open to the public with limited service hours. The Home Economics department at the University of Washington, on the other hand, operates a cafeteria in which students enrolled in quantity cooking classes and dietetic interns supplement regular employees and assume responsibility for the preparation of certain menu items as assigned. Students can study equipment design, material, size or capacity, construction, operation, care, installation and arrangements at the less busy hours during the day and by actual usage (39). The University of Wisconsin is considering mobile equipment, on consignment from manufacturers, so areas of work can be arranged (42).

Summer practicum -- Another approach is a summer practicum in the junior year, followed by a lecture course in the senior year. This gives the institutional management major an opportunity to acquire actual working experience in various phases of food service during his summer vacation. The lecture course is coordinated with the summer practicum (43).

CHAPTER III

METHOD

The purpose of this study was to ascertain if training films in the use and care of large quantity equipment might be substituted for actual experience in courses in large quantity cooking and institutional equipment.

Film

To determine what equipment should be included in training films, a letter and check sheet of 33 pieces of equipment commonly found in quantity food service kitchens was sent to 23 universities and colleges offering advanced degrees in Institutional Management. These schools were selected because of the similar facilities and experiences they would have in the Institutional Management field. This same procedure was followed with recognized authorities in Institutional Management. Appendix A contains a copy of the check sheet, the letter which accompanied it and a list of the departments contacted.

Sources of "Use and Care" or "Training" films were also sought. Letters were sent to 15 institutional equipment manufacturers requesting information on the availability of such films. Only two films were located. One was on Microwave ovens and would not be available until May 1970, the other was on cooking equipment and was specifically directed to commercial bakeries.

It became necessary, therefore, to produce a training film for use

in this study.

Subject Matter -- In the operation of a food service there are certain pieces of equipment that are considered basic and necessary. In trying to determine the most necessary pieces of equipment for an equipment laboratory 23 colleges and universities were contacted and asked to rank, in order of importance, the 20 most basic items in an institutional equipment laboratory. Of the 19 replies received 15 placed the food slicer in the first 15 and 11 ranked it in the first 10. This indicated that the food slicer is an extremely common, frequently used piece of equipment in most quantity food services and students need proficiency in its operation. Most slicers, regardless of size and manufacture, operate in a similar manner. The Hedges Complex Food Service, Montana State University, was chosen as a setting because it was readily available, easily accessible and had a relatively late model food slicer. In the film an operator was shown using a Hobart, Model 1712 electric food slicer. An attempt was made to present the action as it would appear to a student during a demonstration. A script was designed to accompany the pictures (Appendix B).

Techniques -- A Kodak Brownie 8 mm reel-type movie camera was used by the writer. The Hedges kitchen was artificially lighted with two photoflood reflector lamps. The camera was held above and eight to ten feet away from the operator of the slicing machine. The camera was not stationary, but rather was moved to catch the food slicer

operations in the positions which best showed the action of the slicer. Fifty feet of Kodachrome II color indoor film was used. After commercial processing the writer previewed, edited, cut and spliced the film.

Effectiveness

Junior and senior students enrolled in the predietetic program were used to evaluate the effectiveness of the training film. Some had already completed the courses in institutional equipment and large quantity cookery and therefore had experience in using and caring for a food slicing machine. The remainder had yet to be enrolled in the courses. Pencil and paper tests as well as a rating sheet of the operators efficiency was used. (Appendix B). Comparisons could therefore be made between those who had gained information by experience and those who had seen only the film.

CHAPTER IV

RESULTS

The purpose of this study was to determine if training films in use and care of large quantity equipment might be sufficient experience for courses in large quantity cooking and institutional equipment. A film showing the use and care of an electric food slicer was prepared.

Sample

To insure interest in and appreciation for the use and care of institutional equipment, the size of the sample was limited to 14 students enrolled in the predietetic curriculum. Five of these students had been enrolled in "Large Quantity Cookery" and had practical experience in using the slicer. These students had received a grade average of A or 4.00 in this course and had an overall grade average of 2.85 in their predietetic program. The other 9 students had never used a slicer previously. Their overall Grade Point Average was 2.83 (Table I).

TABLE I
GRADE POINT AVERAGE
AT MONTANA STATE UNIVERSITY

Student	Previous Experience	No Previous Experience
1	2.75	
2	3.04	
3	2.99	
4	2.68	
5	2.80	
6		2.56
7		3.74
8		2.30
9		3.37
10		2.93
11		2.60
12		2.81
13		2.17
14		2.96
Average	2.85	2.83

Evaluation

Pencil and Paper Test

A pencil and paper test covering the operation of the slicer was administered to both groups of students (Appendix B). The scores ranged from 13 to 16 or 54 per cent to 67 per cent in the experienced group and 10 to 23 or 42 per cent to 96 per cent in the inexperienced group (Table II). This would seem to indicate closer proximity among the experienced group in the facts and procedures learned. Perhaps the wider range of scores in the inexperienced group indi-

cates all students do not comprehend or cannot apply what they see and learn in the same manner or time.

TABLE II
PENCIL AND PAPER TEST

Student	Previous Experience		No Previous Experience	
	Score *	Per cent	Score *	Per cent
1	15	62.5		
2	15	62.5		
3	16	67		
4	13	54		
5	16	67		
6			18	75
7			22	92
8			10	42
9			16	67
10			21	87.5
11			14	58
12			18	75
13			13	54
14			23	96
Average	15	62.6%	17.4	71.8%

* A perfect score is 24

Demonstration

Each student was observed, by the writer, in the individual operation of the slicer and rated on the various steps of operation, disassembling, cleaning and reassembling of the food slicer. Each student was then rated on whether or not he could operate the slicer easily, was slow and unsure, had to have assistance or did not com-

prehend the operation of the slicer at all.

The ratings of those students with previous experience in the operation of the slicing machine ranged from 15 to 21 or 62.5 per cent to 87.5 per cent (Table III). This range was greater in the students with no experience, 17 to 24 or 71 per cent to 100 per cent.

TABLE III
RATING IN SLICER OPERATION

Student	Previous Experience		No Previous Experience	
	Score *	Per cent	Score *	Per cent
1	16	67		
2	18	75		
3	17	71		
4	21	87.5		
5	15	62.5		
6			24	100
7			24	100
8			17	71
9			21	87.5
10			19	79
11			23	96
12			24	100
13			22	92
14			24	100
Average	17.4	72.6%	22	91.7%

* A perfect score is 24

All students were successful in performing the task of operating the slicer in either a slow and unsure manner or with assistance. Eighty per cent of the experienced group operated the slicer slow and

unsure compared to 78 per cent of the inexperienced students. Students operating the slicer with assistance were 20 per cent in the experienced group and 22 per cent in the inexperienced group (Table IV).

TABLE IV
OVER ALL RATING IN SLICER OPERATION

Operated Slicer	<u>Previous Experience</u>		<u>No Previous Experience</u>	
	<u>Number</u>	<u>Per cent</u>	<u>Number</u>	<u>Per cent</u>
Easily	0	0	0	0
Slow and unsure	4	80	7	78
With assistance	1	20	2	22
Did not comprehend	0	0	0	0

Recall

Twenty-three days later each student independently completed a test which consisted of listing, in order, the important steps in operating and cleaning the food slicer. The average score in the two groups was approximately the same, 60.8 per cent for the experienced group as compared to 60 per cent for the inexperienced group.

(Table V).

TABLE V
 SCORES ON PENCIL AND PAPER TEST
 23 DAYS RECALL

Student	<u>Previous Experience</u>		<u>No Previous Experience</u>	
	<u>Score</u> *	<u>Per cent</u>	<u>Score</u> *	<u>Per cent</u>
1	16	67		
2	14	58		
3	13	54		
4	14	58		
5	16	67		
6			18	75
7			19	79
8			10	42
9			16	67
10			13	54
11			15	63
12			17	71
13			10	42
14			10	42
Average	14.6	60.8%	14.2	60%

* A perfect score is 24

CHAPTER V.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

We are living in a rapidly moving, changing society where our educational requirements and methods are also growing and changing. To meet the demands of our professions new techniques and developments must be utilized. Audio-visuals are one of these relatively new developments. This study was undertaken to determine the feasibility of using films as a part of the training institutional management or predietetic students receive in the use of large quantity equipment.

The advantages of motion pictures for education is that films make a strong appeal to all age levels and races of people. They not only entertain the students but develop interest among them. Interest aroused by motion picture does not subside when the picture fades from the screen but continues and develops into various forms of intellectual activity.

If nothing else could ever be said about films used in school, it would be enough to know that students like them, that students interest is aroused by them, and that students are sensitive to their educational values. These reactions are not the ends toward which education is directed but they are conditions that are essential if the ends of education are to be achieved (9).

In developing this study a letter and check sheet were sent to several universities and colleges offering advanced degrees in Institutional Management requesting information to determine what equipment should be included in training. A search for "Use and

Care" or "Training" films revealed little to be available to suit our purposes. It was decided, therefore, to produce a training film and accompanying script depicting using and cleaning a food slicing machine for use in this study.

The participants in the study were junior and senior students enrolled in the predietetic curriculum. The students were divided into two groups, an experienced group consisting of five students who had completed the courses in institutional equipment and large quantity cookery and an inexperienced group consisting of nine students who had no training or experience in operating a food slicer. Only the inexperienced group viewed the film. Pencil and paper tests were used as an instrument of observation along with objective ranking in the actual use and cleaning of the slicing machine. A second pencil and paper quiz was given both groups 23 days after viewing the film, operating the slicer and writing the initial test.

All of the students participating in the study operated the slicer either with assistance or were slow and unsure. There was no appreciable difference in this operation between the two groups. In the objective ranking of students in the slicer operation the inexperienced group did 19 per cent better than the experienced group. The paper and pencil quiz administered at the time of initial testing also indicated that the group of students who viewed the film scored 9.2 per cent higher than the other group. This was not true after 23 days. The test scores at that second testing were approximately

the same.

Conclusions

On consultation with a statistician it was decided nothing would be gained by a statistical analysis of these results. This study should be viewed as exploratory research. This type of research tends to incorporate fewer controls and, as a result, objective verification suffers. Like other less structured techniques, however, it tends to be highly suggestive within the context of the results (44).

It was believed at the beginning of this study that a program of instruction utilizing motion pictures could be used in lieu of actual experience, that predietetic and institutional management majors can learn the operation of food service equipment through the use of training or use and care films. In working with such a biased and limited sample no definite conclusions can be made.

Results would seem to indicate that the film succeeded in its primary purpose of instructing and demonstrating the fundamental principles in the operation of a food slicer after a very limited exposure. The film, however, cannot stand alone, interest must be continued in some form. If film viewing should be followed by actual working situations, the value of this type of film may be realized in less actual instruction and laboratory time spent in the use of equipment. Film viewing on an independent basis could free the instructor for other more pressing or relevant duties. On the basis of these positive

findings, this study should be repeated with other equipment and utilize a larger sample.

Recommendations

Improving the Study

The one major weakness of this study is the small sample. To provide more concrete and meaningful data a larger group should participate.

The participating students were asked to state what, in their opinion, was the most important point in the operation of the food slicer. All five of the students experienced in the actual operation and use of the slicer and five of the inexperienced students (71.4 per cent of all students) indicated that the safety aspect was vital. Typical comments included "Be careful because it is a very dangerous piece of equipment," "Use safety procedures at all times," and "Safety factor - the danger involved." This leads the writer to believe more emphasis should be placed on safety in the film.

For Future Study

The participating students were asked "In your opinion, after viewing the food slicer film, do you feel films of this nature can (a) replace or (b) supplement, some experiences in the quantity foods laboratory?" One hundred per cent responded (b) supplement. Comments included, "I don't think films could completely replace using machines

unless a point was made to have the students use machines in Institution Experience. Large Quantity Cookery could be made a better course with films of cooking." and "I didn't see the film, but would say that it could supplement some experiences in the quantity foods laboratory. It would be wise to show the film at the beginning of the course so that each person could have knowledge of the machine before working with it. This would overcome repetition for the instructor." This might suggest a research study pertaining to some further aspect of large quantity cookery.

A letter received from an equipment company indicated that in 1970 they would be producing "Use and Care" films showing each piece of their cooking equipment in operation. This would be available on a loan basis or may be purchased for a reasonable amount (45). This could aid in a future study by eliminating the actual film production. More testing could be planned in future studies including a second operation of the machine involved to present stronger results.

APPENDIX

APPENDIX

A

—Montana State University—

Bozeman, Montana 59715

Tel. 406-587-3121

School of Home Economics

July 24, 1969

Name
Title
Address

Dear

A very important part of the Dietetic and Food Service majors training is the experience they receive in the Institutional Management equipment laboratory.

Currently we do not have such a laboratory at Montana State University but we are planning to establish one. Because of the outstanding record of your University in the Institutional Management field we are contacting you for assistance. It would help us immensely to know what you consider the most basic equipment with which to furnish this laboratory.

Attached is an inventory check list. Please rank this equipment in order of importance for an Institutional Management equipment laboratory.

We are looking forward to initiating this program as soon as possible and would appreciate your reply by return mail. We are enclosing an envelope for your convenience.

We appreciate your interest and cooperation. Thank you.

Sincerely,

(Mrs.) Louise J. Oman
Instructor
School of Home Economics

—Montana State University—

Bozeman, Montana 59715

Tel. 406-587-3121

School of Home Economics

November 26, 1969

Name
Address

Gentlemen:

A very important part of the Dietetic and Food Service majors training is the experience they receive in the Institutional Management Equipment laboratory. Currently we do not have such a laboratory at Montana State University but we are planning to establish one as funds become available. Until actual equipment is available we will supplement with films. Eventually these films will be replaced by equipment.

We know that you manufacture some of the most efficient equipment in the Institutional equipment field.

Do you have any "Training" or "Care and Use" films of your equipment? Would it be possible for us to have the use of these films in the laboratory outlined above?

If we are unable to obtain a source of these films we plan to make them. Therefore we would appreciate your immediate attention. We are enclosing an envelope for your convenience.

We appreciate your interest and cooperation. Thank you.

Sincerely,

(Mrs.) Louise J. Oman
Instructor
School of Home Economics

COLLEGES AND UNIVERSITIES CONTACTED

Head, Department of Foods, Nutrition and Institutional Management
The School of Home Economics
University of Alabama
University, Alabama 35486

Head, Institutional Management Department
College of Home Economics
Iowa State University
Ames, Iowa 50010

Head, Department of Institutional Management
The College of Home Economics
Kansas State University
Manhattan, Kansas 66502

Director of the School of Home Economics
Louisiana State University
Baton Rouge, Louisiana 70803

Head, Department of Food, Nutrition and Institution Administration
The College of Home Economics
University of Maryland
College Park, Maryland 20742

Chairman, Department of Institution Administration
College of Home Economics
Michigan State University
East Lansing, Michigan 48823

Chairman, Department of Home Economics
University of Mississippi
University, Mississippi 38677

Chairman, Institution Management
Home Economics Department
University of Southern Mississippi
Hattiesburg, Mississippi

Head, Food and Nutrition Department
School of Home Economics
University of Missouri
Columbia, Missouri 65201

Head, Institutional Management
New York State College of Home Economics
Cornell University
Ithaca, New York 14850

Chairman, Foods and Nutrition
School of Home Economics
Ohio University
Athens, Ohio 45701

Director, School of Home Economics
Ohio State University
Columbus, Ohio 43210

Food, Nutrition and Institution Administration
College of Home Economics
Oklahoma State University
Stillwater, Oklahoma 74074

Food Service and Housing Administration
College of Human Development
Pennsylvania State University
University Park, Pennsylvania 16802

Department of Institutional Management
Home Economics Administration Building
Purdue University
Lafayette, Indiana 47907

School of Home Economics
Texas Technological College
Lubbock, Texas 79409

Dean, College of Household Arts and Sciences
Texas Woman's University
Denton, Texas 76204

Chairman, Home Economics Department
215 Home Economics Building
University of Utah
Salt Lake City, Utah 84112

Chairman, Department of Institution Economics
Washington State University
Pullman, Washington 99163

Institution Administration
School of Home Economics
University of Washington
Seattle, Washington 98105

Director, Division of Family Relations
West Virginia University
Morgantown, West Virginia 26506

Dean of the School of Home Economics
Winthrop College
Rock Hill, South Carolina 29730

Chairman, Foods and Nutrition
The School of Home Economics
University of Wisconsin
Madison, Wisconsin 53706

EQUIPMENT MANUFACTURERS CONTACTED

The Hobart Manufacturing Company
Troy, Ohio 45373

S. Blickman, Inc.
3907 Gregory Avenue
Weehawken, New Jersey 07087

Vulcan-Hart
P.O. Box 696
Louisville, Kentucky 40201

Cory Corporation
3200 W. Peterson Avenue
Chicago, Illinois 60645

General Electric
Commercial Equipment Department
14th & Arnold Streets
Chicago Heights, Ill.

Market Forge
Cooking Equipment Division
Marketing Department
Everett, Massachusetts 02149

Tyler Refrigeration Division
Clark Equipment Company
Niles, Michigan 49120

Frymaster Corporation
P.O. Box 8618
Shreveport, Louisiana 71108

Legion Equipment Company, Inc.
21-07 40th Avenue
Long Island City, N.Y. 11101

Middleby-Marshall Oven Company
8240 Austin Avenue
Morton Grove, Illinois 60653

Koch Refrigerators, Inc.
401 Funston Road
Kansas City, Kansas 66115

Litton Industries
Atheron Division
2531 North Second Street
Minneapolis, Minnesota 55411

Toastmaster
Food Equipment Division
McGraw - Edison Company
Algonquin, Illinois 60102

The Cleveland Range Company
971 East 63rd Street
Cleveland, Ohio 44103

The G. S. Blodgett Company, Inc.
Burlington, Vermont 05401

APPENDIX

B

Please rank, in order of importance (using 1 as most important, 2 next important, etc.), the 20 most basic items necessary in an Institutional Management Equipment laboratory. Check and/or add any other items you feel are essential.

_____	Broiler, Char (open Hearth) Type
_____	Counter Top Type
_____	Salamander Type
_____	Can Opener
_____	Coffee Urn
_____	Deep Fat Fryer
_____	Dishwashing Machine
_____	Dispenser, Beverage
_____	Cream
_____	Milk
_____	Disposal, Power Food Waste
_____	Floor Maintenance Machine
_____	Grill
_____	Mixer, Food and Attachments
_____	Oven, Convection
_____	Deck
_____	Infra Red
_____	Micro Wave
_____	Roast
_____	Rotary
_____	Potato Peeler
_____	Range Hood and Filters and Exhaust Fan
_____	Refrigerator
_____	Scales
_____	Sink
_____	Slicer, Food

_____ Steam Equipment: Steam Cooker (6 psi)
_____ Steam Jacketed Kettle
_____ Small High Pressure Steamer (15 psi)
_____ Trunnion Type Steam Jacketed Kettle
_____ Toaster, Conveyor Type
_____ Pop Up Type
_____ Work Table
_____ Other

Rating form used by the writer after viewing film and operating slicing machine

- _____ Plug machine in
- _____ Adjust fence to guide meat
- _____ Position meat grip holding meat in place
- _____ Adjust slice to regulate thickness
- _____ Turn on switch
- _____ Grasp handle to move carriage, move meat through slicing blade
- _____ Turn machine off - prepare to engage power carriage
- _____ Position carriage to front (dial end)
- _____ Lift actuating lever to point of self locking
- _____ Move carriage forward - turn machine on - machine now slicing automatically
- _____ Turn machine off - prepare to change carriage speed
- _____ Pull shift knob out and up to increase speed, down to decrease speed
- _____ Turn machine off - prepare to disassemble and clean machine
- _____ Unplug
- _____ Loosen two retaining knobs at top and bottom of front knife guard
- _____ Remove front knife guard
- _____ Unscrew knob and remove back blade guard
- _____ Loosen set screw and remove fence
- _____ Loosen lock nut under carriage and lift carriage off
- _____ Wipe machine - wash machine parts
- _____ Reassemble machine - place back guard in position and tighten set screw
- _____ Place front guard in position - tighten screws
- _____ Slide carriage into place - tighten set screw
- _____ Replace fence

Perfect score - 24

CHECK LIST

Used by the writer after viewing film and operating slicing machine

- ☐ Operated Slicer Easily
- ☐ Operated Slicer - Slow and Unsure
- ☐ Operated Slicer With Assistance
- ☐ Did Not Comprehend Operation of Slicer

1. List, in order, the important steps in operating the food slicer.

2. List, in order, the important steps in cleaning the food slicer.

1. List, in order, the important steps in operating the food slicer.

2. List, in order, the important steps in cleaning the food slicer.

SCRIPT

(Film in this order)

1. Machine - front switch and adjustment side with carriage.
2. Plug in.
3. Place meat in carriage and adjust fence to guide meat.
4. Set meat grip to hold meat in place.
5. Set slice adjustment to regulate thickness of slice.
6. Turn switch on.
7. Grasp handle and move carriage back and forth, moving meat through slicing blade.
8. Turn machine off - prepare to engage power carriage.
9. Position carriage to front (dial) end.
10. Lift actuating lever to point of self locking.
11. Move carriage forward. Turn machine on.
12. Machine now slicing automatically.
13. Turn machine off - prepare to change carriage speed.
14. Pull shift knob out and up to increase speed, down to decrease speed (shift knob located in front of machine, below right of off-on switch).
15. Turn machine off, close slice adjustment and unplug, preparing to disassemble and clean machine. (Pull plug - do not pull cord).
16. Loosen two retaining knobs at top and bottom of front knife guard.
17. Remove front knife guard - rotating clockwise and clearing screws and studs.
18. Unscrew knob and remove back blade guard.
19. Loosen set screw and remove fence.
20. Loosen lock nut under carriage and lift carriage off.
21. Wipe front and back of slicing blade, gage plate and base first with damp, soapy cloth, then with dry cloth.
22. Wash removed parts in mild soap and water. Rinse and dry with clean cloth.
23. Reassemble machine. Place back guard in position and tighten set screw.

24. Place front guard in position and twist counter clock wise, positioning in line with screws and studs. Tighten screws.
25. Slide carriage into place, tighten set screw.
26. Replace fence. (46).

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