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The Construction and Use of Eight Millimeter Single Concept Films in Industrial Arts

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THE CONSTRUCTION AND USE OF EIGHT MILLIMETER SINGLE CONCEPT FILMS IN INDUSTRIAL ARTS

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CHAPTER I

THE PROBLEMS AND DEFINITIONS OF TERMS USED

A teacher has four basic jobs: (1) decide what to teach (2) decide how to teach it (3) teach it and (4) determine if he has taught what he attempted to teach. Industrial Arts teachers usually have a number of activities going on simultaneously. They, like other teachers, face students of varying abilities and interests. Due to these factors most of a teacher's time is spent in the "doing" of number three, that is, using some method of presenting information to his students. He may be under considerable pressure to instruct several pupils concerning different problems at or nearly the same time.

The Industrial Arts teacher's time is also used supervising the class, supervising the construction of projects and the sale of materials--to mention a few duties. In order to free himself from showing each student how to perform a certain task when that student is ready, the Industrial Arts teacher has helped develop some rather good techniques. These include demonstrations, job sheets and instruction sheets.

The above mentioned techniques, while good, have not always worked as well as was hoped. The need for better ways of presenting information led to this study.

I. THE PROBLEM

Statement of the Problem

It is the purpose of this study (1) to investigate the local production and use of silent eight millimeter loop films and (2) to construct a film to demonstrate the possibility of local production.

The following assumptions are made concerning the advantages of the use of silent eight millimeter loop films as a means of giving a demonstration:

1. The demonstration will be better organized;
2. The film will present only pertinent information;
3. Each student will be able to see the demonstration from the same point of view;
4. The demonstration may be viewed as many times as is necessary to absorb the information;
5. There will be the proper projection equipment available for use when needed;
6. The demonstration can be reviewed when necessary;
7. A student who has been absent may see the demonstration when he returns without the teacher's

supervision;

8. Nearly anyone can be taught to operate a cartridge-load projector in a short period of time;

9. The silent eight millimeter loop film requires a short viewing time.

Importance of the Problem

The quest for better ways of presenting information has led to better methods. None of these methods have been the ultimate and it is unlikely that any will be by itself. During a demonstration some students cannot see the demonstration as well as others. Some students may be absent requiring the demonstration to be repeated. Instruction sheets designed to teach without the teacher are not always read. One or several students may need to be given a demonstration but the teacher also has a responsibility to the remainder of the class.

The above mentioned observations seem to indicate the need for further study and development in methods of instruction. This writer believes that teachers in the field can assist greatly in developing and improving new methods. Little good will come from new developments by researchers until teachers become involved with these developments.

II. DEFINITIONS OF TERMS USED

Camera Editing

Camera editing is a term which covers the planning and filming stages of the film production. The term implies that by thorough planning of scene length and detail and by practice before filming, most of the cut and glue editing can be eliminated.

Local Production

Local production as used in the literature refers to the making of films or other educational materials by school people.

Loop Film

A term used in reference to the eight millimeter film which is placed in a plastic cartridge. The film ends are spliced together so that there are no ends. In this way a cartridge may be placed in a special projector and the film viewed over and over without threading or rewinding. Some other terms used in place of loop film are single concept, concept, film bit, silent loop and single concept loop film. In this work the term loop film will be used in preference to other terms.

Panning

Panning is a technique used by photographers.

It is the movement of the camera to follow a moving object; to cover a scene wider than the lens can take in from one position; or to move from one scene to another when it is important to connect them.

Production

Production as used in this writing refers to the construction of an eight millimeter loop film. This includes the steps of planning, filming and editing.

Reflex Viewing

A camera with reflex viewing is one which allows the operator to view the scene through the lens which takes the picture.

Single Concept Film

The term single concept film is generally used to mean a short film, which is placed in a plastic cartridge with the film ends cemented together to form a continuous loop. Other terms sometimes used synonomously were given under "loop films" above. The single concept film usually covers one or a limited, closely related group of ideas.

Zooming

Zooming is the use of the zoom lens to move from

a long shot to a medium or a close-up shot.

Zoom Lens

A zoom lens is infinitely variable from its widest coverage to its narrowest, longest range coverage. On modern cameras this generally means that it can replace a wide angle lens, normal lens and telephoto lens.

CHAPTER II

BACKGROUND FROM THE LITERATURE

Eight millimeter loop films are rather new in the world of educational motion pictures. There are several reasons why they have been developed. It is hoped that the information given here will clearly reveal these reasons and the place of this medium in the history of motion pictures. The remainder of this chapter will be devoted to the following sections: (1) The historical development of educational films; (2) Some of the problems in the use of films in education; (3) Eight millimeter films; (4) Single concept films; (5) Loop films; and (6) The future of eight millimeter.

The historical development. The value of films has an historical setting. For the purposes here let us review this briefly. Prior to World War II motion pictures had been used largely in the entertainment field.

During World War II the Armed Services used many training films. No doubt they were well constructed for as Wendt says, "In some cases an audio-visual device got training results as well without an instructor as with

one" (33:15). These results were accomplished without the benefit of organized research in the fields of educational films.

After World War II the Armed Services started a massive research program to find what elements in a film make it effective (33:20-23). Their findings, along with findings of other researchers, are helping producers construct better films and helping teachers make more effective use of films.

Good films properly used have been demonstrated to increase learning. In one experiment (33:10) a group which used films along with other methods learned 20% more than the control group which used the same methods and materials with the exception of the films. Six weeks later the film group had retained 38% more information than the control group.

At least one technique often used by teachers is not supported by research. It was found that less is retained when taking notes during the film showing (31:21). This was possibly due to inattention to the film during the writing of notes.

The great bulk of the films produced for education were distributed in sixteen millimeter gauge. Some experiments were done in other gauges such as thirty-

five millimeter, seventeen and a half millimeter, twenty-eight millimeter, twenty-two millimeter, twenty-one millimeter, fifteen millimeter, eleven millimeter and eight millimeter. The larger films were expensive and the smaller gauges were less satisfactory in their performance. In the past few years, however, there has been a renewed interest in eight millimeter films. This gauge has been used by the home movie amateur in ever increasing numbers. This enlarging market has resulted in better equipment which in turn gives better results. The latest changes in eight millimeter include self threading projectors, cartridged film, new film formats which give up to 50% more picture area and now the instant projector which accepts cartridged film. These improvements have eliminated or reduced many of the objections to the smaller gauges and the use of projection equipment (12).

How important are these mechanical developments? History, of course, will be the final judge! These developments will, most likely, be judged by their contribution to the usefulness of film. Film, like books and television, has had a great impact upon human attitudes and outlooks. Printed material has been most effective since it has been available to the masses. "The book in its manuscript form, was so precious that it was often

chained to the reading table in the monastery" (14:5). Films, being quite expensive, are now locked up in a central film library, quite inaccessible to the masses. Possibly eight millimeter with its less expensive and easier to use equipment, will make films more accessible.

Problems in the use of films. For many years, teachers have been advised to show only that portion of the film that fits their need (27:15). However, to locate that section in advance of showing is in itself a problem. If the entire film is used, the usual length being twenty minutes, a large portion may be taken from a teaching period (25).

Sixteen millimeter film prints are expensive and usually must be borrowed from a central library (25). Making arrangements in advance is again a problem for the teacher must plan more precisely the exact date the film is to be used (19). If the teacher does not order early he may find the film booked for the date he needs it.

Once the film is on hand more problems present themselves. The film should be previewed by the teacher so that he may become familiar with it (17:4). Next comes the showing date when a centrally located projector and screen must be scheduled as was the case for previewing. Other physical problems such as darkening the

room and placement of the speaker and projector may come up. Some teachers find the operation of costly, delicate equipment a frightening experience.

The film may be shown several times while the teacher has it in his possession. Then the film and equipment are returned. If the film is needed for review later in the unit, all the above procedures must be repeated.

The above listed problems which included economical use of time, cost of material and equipment and difficulties of showing omitted one further and vital problem. That is finding a film or selecting the best film to do the required job. In some areas of instruction, appropriate films are not available. There are only thirteen demonstration-type film titles available for the metal shop instructor to use which are listed in film catalogs of the three major film libraries in the State of Washington.

If cost and availability were no problem, the following might be an ideal solution to some of the above problems: a classroom equipped with easily and quickly adjusted darkroom shades, a permanent wall hung projection screen, a projector kept in the classroom and a cabinet of appropriate films. Perhaps where an appropriate film is not available, easy to use equipment would be

made available to construct a film locally. Cost and availability are factors, however, which nearly everyone has to live with and which keep such relatively ideal conditions from being common in schools.

The next consideration was to look into some of the developments of the new eight millimeter equipment and silent loop films.

Eight millimeter films. We know from experience and research that sixteen millimeter film can inform and that it is an effective teaching tool in many areas. We know that there are many thousands of film titles available in sixteen millimeter gauge so why change to eight millimeter? First of all, the advocates of eight millimeter do not expect sixteen millimeter to lose its valuable place as an educational media, rather, it is felt that experience and research will show where eight millimeter can be most valuable (1:29). If sixteen millimeter film can inform then we should expect at least the same ability from eight millimeter film. Eight millimeter will undoubtedly find its rightful place just as filmstrips and transpariencies for overhead projection have found theirs.

What, then, are some reasons for the use of eight millimeter film? From a technical standpoint eight millimeter film is much easier and cheaper to cartridge than

sixteen millimeter film. Therefore eight millimeter has a definite advantage. Eight millimeter copies are less expensive to make and can be stored in a smaller space than an equivalent in sixteen millimeter film. Where local production is carried on, eight millimeter is less expensive than sixteen millimeter film. Production and projection equipment are less expensive for eight millimeter gauge film (12).

> Films may now be 'chaptered' easily. A long-understood principle in handling ideas in print is to break material into short segments; organization in similar small pieces has not been exploited in motion pictures (12).

Other possibilities with short segments include branching, alternative sequences and testing. Imagination and resourcefulness will probably be the limiting factors for eight millimeter film.

> One of the interesting characteristics of the short cartridged film is that good films prosper with repeated viewings, while bad films quickly become intolerable (10:7).

In order for any medium to be an ideal educational system it should measure up to the requirements as suggested by Louis Forsdale in (10:2):

1. The system needs to be simple enough for even young students to use:

2. The system needs to be inexpensive enough so that nearly any school system can purchase it and, prefer-

ably, in quantities so that the materials and equipment may be placed in classrooms, libraries and study carrals;

3. The system should be of adequate quality to allow use with large groups.

Eight millimeter is generally not used with very large groups but Forsdale reports "that eight millimeter sound film was shown on a twelve foot screen to a crowd of five hundred people (using an arc-illuminated projector) . . ." (14:2). With the advent of super 8 and with technology of today, who can say how eight millimeter will be used in the future;

4. The equipment should be highly portable;

5. There should be many titles available:

6. The equipment should be easily used in the production of locally made films by students and teachers alike.

> '8' already meets these criteria well--better than any film system which education has known to date. At this moment eight millimeter is undoubtedly weakest in the matter of actually providing access to large amounts of material . . . Eight millimeter film today is not the amateur medium which we knew a dozen years ago; indeed technical advances have made eight millimeter today as good as the sixteen millimeter of a dozen years ago and eight millimeter will get better yet (10:2).

Single concept. If eight millimeter has possibilities, what are those of single concept films? Single concept as used in the literature is hard to define but seems to deal with two aspects. A concept (1) is a single idea within a larger whole and (2) a limited group of concepts closely related.

Single concept films are not new. James Markee, Ph.D., Chairman of Anatomy of Duke University Medical College reported the successful use for twenty years of short sixteen millimeter films in the teaching of anatomy (10:4). The skills-training films used in World War II "were found to be most effective when they were short and when they provided immediate opportunities for practice" (33:15).

Loop film. Loop film as described under definitions refers to a film whose ends are connected enabling it to run continuously in a projector. A loop film placed into a cartridge can be viewed over and over without threading or rewinding.

As stated before, good teaching many times requires the selection of a part or parts of a film. To isolate these is a time-consuming job. A better substitute is the inexpensive, short film loop containing just the portion needed. This type film can be obtained

quickly and viewed repeatedly until the learner understands the concepts presented. One method of using the cartridged film loops is for self-instruction. This may be related to teaching machines and programmed learning, which means films must be easily accessible to those needing to use them.

The future of eight millimeter film. The future has both promise and problems for eight millimeter film. Countries who have not committed themselves to sixteen millimeter film and are looking for an inexpensive yet adequate film gauge to start with are looking at eight millimeter film. In 1964 Robert le Franc, head of the French Ministry of Education said, "Within four years there will be one eight millimeter projector for every four French classrooms--a total of between fifteen and twenty thousand" (4).

One great contribution in the field of eight millimeter film is that it changed the motion picture from one of the most difficult to among the simplest of all pictorial media to use. This was made possible with the development of cartridged film, the projector which accepts it and rear projection screens (25). With this equipment one must only place the cartridge into the proper opening and then turn on the power switch. It has

been reported that all ages have been able to learn to operate this equipment with only a few minutes instruction (11:1).

Many teachers have made supplementary material by using mimeographed and dittoed sheets. Local production of films is not new in education, but probably at least one reason it has not been wide spread is the cost of film and equipment. Sixteen millimeter film is about twice as expensive per foot as eight millimeter and runs about one half as long for a given amount of film. With the growth of eight millimeter film more teachers and students will undoubtedly make films (12).

Producing educational materials in any medium is not a simple matter. Teachers have the technical knowledge to be presented and are experienced in methods of presenting the material. Therefore, they have two of the most necessary skills for producing a film. The professional film photographer does not have the experience of the auto mechanics teacher for the many units taught in a good auto-mechanics course; nor the experience of the wood or metal shop instructor when demonstrating the method of setting up power machines. Teachers may not be able to make professional films but they possess the knowledge to construct worthwhile and usable films. The

teacher, no matter what subject matter area, can set up and photograph the teaching process within his teaching station. These locally produced films can be shown to the new classes each year enabling the new students to quickly adapt themselves to the instructional program (23:14).

Learning to make a film, like learning to walk, means to take the first step. A teacher need not feel that a whole series of films should be planned before starting production (9:2). Eight millimeter film is cheap and easy to obtain, eight millimeter cameras and projectors are common and can be borrowed if necessary. One teacher reported thirty-two cameras available from seventy-six students questioned (29:13). Borrowing equipment should be a last resort where school districts do not own equipment.

Inventions and equipment are passive things, it takes imaginative people to put them to work. If film is to be our servant we must put it to work with imagination (9:2).

The shortness of single concept films comes not only from their limiting of content but also from their simplification of film structure. Conventional elements such as establishing shots, elaborate introductions and

transitions are frequently eliminated. These films can be readily shown again and again; therefore, there is little need for the above mentioned repetition to ensure comprehension as there might be for a film designed for a single showing (1:28).

After a film has been exposed and developed it must be edited. Producers have discovered that editing a concept film is different from editing other motion pictures. They found that titles sometimes interfere with the learning process and therefore should be short or non-existent. They found that captions were remembered longer than the spoken word and that no letter should appear smaller than three-fourths inch on a twelve inch screen or one-sixteenth of the screen height (3).

When using a loop film, it has been found

> . . . that classes had need to participate actively if the films were to be successful and that each loop had to be shown twice before the learning process began (3).

This is probably due to the amount of information presented in a short film.

Closeups not only create interest but focus attention on the focal point being studied. Therefore, they should be used whenever the subject at hand suggests close viewing (23:9).

On the other side of the scale are the problems. While eight millimeter seems to be quite good, equipment producers are not idle. They are busy producing new ideas, some are a departure from existing standards. The standard format has seen at least two changes. One is called Format M, the other Super Eight (15:31). They both use a smaller sprocket hole and therefore cannot be used in standard equipment. They both increase the picture area while using eight millimeter gauge film. Of the two, Super Eight seems to have caught a sizable portion of the amateur market (15:33).

Another industry problem of eight millimeter film is the lack of standardization of the sight and sound synchronization (4). Many films require sound to be of value as a teaching aid. These films, to be useful, should be constructed to a standard. The standard should cover all films and projectors. Such standardization would allow a film to be used in any projector with proper synchronization as a result. This type of standardization is present on sixteen millimeter gauge films and projectors and should be available to the eight millimeter gauge film also. Cartridges for sound film projectors and silent projectors are not standardized

and therefore cannot be interchanged.

There are two ways of placing sound on film; one is optical, the other magnetic. Sixteen millimeter has used the optical method for many years. This is easily placed on the film by the film processers, but cannot be put on the film as easily by the producer as can magnetic sound. Film, like magnetic tape used in tape recorders, uses an iron oxide stripe which is affected by magnetic fields to place audio information on the tape. This can be erased if new commentary is desired (11:3).

These problems should not be used as reasons for teachers or school districts to "put off" experimenting with and using this media. Progress will always be with us but the ultimate, never; therefore, teachers need not wait for the perfect media before they begin.

Eight millimeter film has sixteen millimeter and others as its ancestors. Eight millimeter is being embraced now because of several factors. Some of these factors are:

1. Both film and equipment for eight millimeter are less expensive than sixteen millimeter;
2. Eight millimeter can give reasonably good images in the sizes most often used in the classroom. Super

Eight will improve image clarity;

3. Eight millimeter will make possible more extensive local production of film;

4. Eight millimeter cartridged film can alleviate the apprehension of threading projectors;

5. Eight millimeter is lighter and simpler to handle and films take less space;

6. Eight millimeter film with magnetic sound track lends itself to revision and updating;

7. Single concept films lend themselves to flexibility, the study of individual concepts and self-instruction;

8. Eight millimeter may be used for most of the film jobs taken care of by the larger gauges such as accounts of special programs or research and public relations. It is said to be stable enough to use on broadcast television.

These, then are the reasons for the new look at eight millimeter.

CHAPTER III

THE PROCEDURE OF THE STUDY

Making an educational film, like any worthwhile production, starts by formulating an idea of where you want to go. Then you can decide how to get there. This chapter will relate the steps taken from the planning to the finished product of an eight millimeter silent loop film. It will also give alternative steps and related information.

The procedures followed are divided into these broad areas: (I) Planning, (II) Filming, (III) Previewing, Editing, (IV) Having the Film Copied and Cartridged, and (V) Making a Film Guide.

I. PLANNING

Selected a Topic for Filming

Selecting a topic began with the making of a list of possibilities. This list was then narrowed by the author's preference. These prospective topic titles were then compared to titles in current film catalogs to ascertain, as accurately as possible, whether films by these titles had been made. The most complete source of information for the short eight millimeter loop film titles

is Technicolor's film source catalog. This catalog lists the single concept film producers around the world and the titles which they have and in some cases are producing.

Once it was determined that none of the proposed titles had been produced, and no producer could be found who had the production of them under way, it was decided to produce a film on the theme "The Use of Engine Lathe Chucks". After proceeding through some of the steps to be explained later the title was altered to "The Four-Jaw Independent Chuck".

Selected a Starting Point

In order to select a starting point one must determine what information a student should possess before viewing the film. This is basic as concepts are built one on top of the other. The following prerequisites were given so that a student might proceed from the film to the operation of the lathe as demonstrated in the film. (1) The student should know the names and purposes of the various parts of a machine lathe. (2) The student should know the oiling and cleaning procedure for an engine lathe. (3) The student should know how to select lathe tools to do a required job. (4) If preground tools are not available to the student, he should

know how to sharpen the required tools.

Stated Objectives

In order for an instructional media to do its job, the expected outcome must be clearly stated. The outcome should be in terms of what the pupil is expected to be able to do (22).

In the case of this film, the following objectives were given. (1) The student should be able to select the proper chuck for use jobs similar to those shown. (2) The student should know how to clean and oil the threads of the chuck back plate. (3) The student should be able to rough-center stock by the use of the concentric circles on the face of the chuck before he starts the lathe. (4) The student should be able to center the stock within a few thousandths by the chalk method. (5) The student should be able to reverse the chuck jaws so that the chuck can handle larger stock. (6) The student should be able to chuck internally short work which has a hole sufficiently large to accept the jaws.

Selected Film Length and Type

It had been decided to make a short silent film and encase it in a cartridge as a loop film using eight millimeter film.

The short loop film can be of high density subject content because a loop film can be repeated without stopping until all the facts are assimilated. The Technicolor Magi-Cartridge was decided upon because the projectors seem more readily available. The cartridge has one feature which might be counted a disadvantage. That is, it will only hold fifty-five feet of film, which is slightly more than four minutes of showing time. However, this same feature might be considered an advantage as this limits the coverage and allows for quicker repeat showing of a limited group of facts.

The design of silent films also presents a challenge. To be effective a silent film must present the ideas intended without verbal comment. They must use titles and sub-titles or short notes. If very many of these are needed to make the ideas clear, it would be better to use a film with a sound track. However, this adds cost to the production.

In order to meet the College requirement of two copies of each film with a thesis and for the author to have a copy of each film it was shot on sixteen millimeter. Better copies are available when eight millimeter copies are made from sixteen millimeter film. In local production where a single copy is all that is

desired the original may be filmed on eight millimeter film.

Prepared a Tentative Scene Outline

A sequence of scene cards were prepared. Information on the cards included a sketch of the scene, information on the scope of the shot labeled as CU, close up; MS, medium shot; or LS, long shot. Also included was the expected length of time for each scene. The use of cards worked very well because it allowed for easily made changes.

At this point it appeared that the proposed film was taking in too many scenes. It also appeared that the proposed scenes would run well over the four minutes. It was decided not to make any changes until after the next step, the making of a video tape.

Made a Video Tape with College Equipment

The author had an advantage by having the College video tape equipment available. It was a help to have immediate playback to aid evaluating, scene effectiveness and camera angle. Many helpful suggestions were made by committee members who viewed the tape later.

A video tape recorder is quite expensive to purchase but relatively inexpensive to operate. The tape may be used over and over with very little deterioration. On the other hand, film producing equipment is much less expensive but the film may be exposed only once. If that exposure is not what was desired new film must be obtained.

While helpful, the video tape recorder is not essential to making a good film. Thorough planning of the preceding steps, plus a sufficient number of rehearsals in front of the camera and lights before filming, should eliminate most of the rough spots. Any mistakes can be cut out of the film and retakes spliced in. This, of course, means wasted film and added cost. When discussing filming with Dr. Murphy, he stated that they use about one foot of film out of every three taken. Stapley claims camera editing is possible by close observance of the above mentioned steps (28).

Secured Filming Equipment

The following pieces of equipment and materials were secured for filming:

Camera. A sixteen millimeter Kodak movie camera was borrowed. It had a standard lens and view finder.

This proved somewhat difficult to use in close work because it is not parallax corrected. That is, for close up work, the view finder does not show what the lens is admitting to the film. A better type camera would be one which has reflex viewing. Another desirable feature would be a zoom lens.

Film. There are several types of color film on the market and each has its own characteristics. The author obtained Kodachrome II type A indoor color film as this was all that was readily available. If in doubt about what film to use one should contact his photo dealer. The cost of the film was $9.50 a roll--four fifty foot reels of film were used. This cost included the raw film, processing and postage.

If eight millimeter copies are to be made from sixteen millimeter film then it might be wise to obtain two copies when the original is developed. One copy is used as a work copy, the other is not run through any machine to keep it in perfect condition. After the work copy has been edited then the original is altered to match. Matching can be made easier by the use of edge numbered film. This is a special film and would probably have to be ordered by a photo dealer. These are refine-

ments which are not necessary to local production.

Lights. Two lights were used, a Sylvana Sun Gun and a four light, flood light bar.

Editor. A sixteen millimeter Craig editor was used. This piece of equipment has several parts. It has two reel holders with hand cranks for moving the film through the viewer. In front of the viewer a splicer was mounted.

Tripod. A tripod helps give a steady image. A heavy duty elevator tripod was obtained for use.

Light meter. A light meter is necessary to accurately measure light values. A Weston Master III light meter was used.

Film cement and emery board. The emery board is used to clean the emulsion from the plastic film back so that the cement can bond the plastic together. The emery board is the type used for manicuring. A good quality film cement is a wise investment.

White cotton gloves. White cotton gloves were purchased to handle the film. The gloves help keep finger prints and scratches from getting on the film during

editing.

Art materials. The art materials included two inch paper letters, burlap material, one-quarter inch mahogony plywood and Scotch brand Double-Stick Tape (adhesive both sides).

II. FILMING

Room Arrangement

The room was arranged so that it would appear neat and orderly. Any objects of a distracting nature which might appear on the film were removed or camouflaged.

Lights and Camera Arrangement

It is generally recommended to have more than one light source. These are usually placed one on each side of the camera in such a way as to eliminate most harsh shadows and uneven lighting. This was the procedure used in the author's film. Ideally the entire room should be evenly lighted.

A demonstration film, to be most effective, should be shot with the camera near where the eyes of the trainee would be when performing the skill. This principle was verified by research reported by Wendt (22:23).

A minimum amount of panning and zooming is also desirable as these techniques used unnecessarily can be distracting.

Check Camera Adjustments

An adjustment that must be properly set is the "f" stop. This adjusts the lens opening and should be accurately determined by a light meter.

When the light is low and the lens opening is quite wide it is necessary to check the camera to subject distance quite closely. When the camera position is changed, as in this film, the distance from camera to subject must be checked each time before the film is exposed.

Dry Run the Scene

Each scene was dry run several times before filming began to make the scene flow more smoothly. This was carried out with all personnel, props, lights and camera in their places and functioning as if the filming were taking place.

Titles and Sub-Titles

The titles and sub-titles were filmed separately from the scenes and after the scenes were filmed. This proved wise as there were some last minute alterations

in wording.

Words were spelled out with two inch paper letters. The background for the title was orange burlap cloth. This was used for color and texture. The subtitles used the same lettering and unfinished mahogony plywood background. The letters were fastened to the background by the use of Scotch brand Double Stick Tape.

Exposed Film

Exposing the film was the next step. All camera settings were double checked, the spring was wound, then the signal was given and the filming began.

Repeat for Each Scene

The film herein described was shot in six scenes. Several days were required to complete all scenes. Two to three hour blocks of time were used to minimize set up and take down time needed. Each scene required the repetition of the appropriate steps as described above.

Mailed Film

As soon as each roll of film was completed it was placed in a shipping mailer which was purchased with the film. It was then sent to Kodak Film Company for processing. There are several other companies who could

handle this service.

III. PREVIEWING AND EDITING

Previewed Film

The film was previewed as soon as it was returned from the processer. A check was made on the following items to assure the usability of the film:

Exposure. This is the amount of light which reached the film. Over exposure will mean washed out pictures lacking detail. Under exposure will give dark pictures. All scenes should be exposed as nearly the same as possible.

Clipping. This may happen in standard view cameras when filming close ups. It is noticeable at the top of the picture. Tops of heads or other scene parts will be trimmed or cut off when clipping has occured.

Scene length. Scene length was timed and noted for future reference.

Edited film. Some editing is usually necessary even when "camera editing" has been used. Editing consists of cutting the scenes apart where necessary and

arranging the scenes in the proper sequence. Old egg cartons were used as storage bins for the loose clippings. Any container which will not scratch the film may be used. The next step was to clean the film ends and cement the scenes together. The emulsion on the face of the film must be removed from the film back before the glue will bond the pieces together. The cement is a special material which fuses the plastic film backs together.

Once completed the film was previewed to determine if all views were present and complete. Next the film was timed and found to be longer than the maximum of five minutes, which can be placed in a cartridge. It was then cut into two parts of three scenes each. The second part was given a film title only.

IV. HAVE FILMS COPIED AND PLACED IN A CARTRIDGE

The next step was to have the two necessary copies made. These films were to be placed in cartridges so Technicolor was selected because they can both copy and cartridge films and thereby saving a step in the processing.

V. MAKING FILM GUIDES

The final step in the process of making this instructional film was the making of a film guide. A film guide increases the usefulness of a film. If the film is to be used by students for self instruction, the guide should be written for them as well as the teacher.

The following areas were developed for the author's film guides:

1. Title and author;
2. The concept covered;
3. The anticipated pupil understanding;
4. The approach used;
5. Suggested preview assignments;
6. The film sequence;
7. Suggested activities.

The completed film guides for these films appear at the end of Chapter IV.

The above steps of procedure as given in this chapter proved effective in the production of the author's film. There was one exception. The film, "The Four-Jaw Independent Lathe Chuck" has a number of related concepts which probably should have been planned as several films.

CHAPTER IV

THE FILM

I. THE SCENARIO: THE FOUR-JAW INDEPENDENT LATHE CHUCK

Films are generally broken into scenes which can be examined individually. The films made for this study, demonstrating the possibility of local production, have been divided into scenes. The individual scenes and their descriptions are listed below. The film guide will make up the second part of this chapter.

Film I--The Four-Jaw Independent Chuck: Selected Related Information

Scene I: Title. Scene one is the title scene for this film which also included acknowledgements to the faculty and College and the producer's name.

Scene II: Selecting the Chuck. This scene begins by showing a number of work pieces which might be machined on the lathe. The title board identifying a three-jaw universal chuck and a four-jaw independent chuck makes up the background. The lathe operator sorts the work pieces according to whether a piece may be turned in the three-jaw universal chuck or may be turned in the four-

jaw independent chuck.

Scene III: Mounting the Chuck. In scene three the operator cleans the chuck and the headstock threads and oils the headstock spindle threads. Next, the chuck is mounted on the lathe headstock spindle.

Film II--The Four-Jaw Independent Chuck: Selected Chucking Setups

Scene I: Chucking a Round Rod. A round rod is placed in the four-jaw independent chuck. This chuck is equipped with concentric circles which are an assistance when rough centering stock. The piece is then, more accurately centered by trial and correction using the chalk method of marking the high side of the work piece as it is turned around.

Scene II: Internal Chucking. The operator internally chucks a short piece of tubing so that it may be turned externally. He then starts a cut.

Scene III: Reversing Jaws. In this scene the operator selects a large rectangular work piece. He holds the plate up to the chuck indicating the chuck is too small with the jaws turned in, so he reverses the jaws.

The operator now proceeds to mount the work piece in the chuck and to enlarge the hole by boring.

II. FILM STUDY OUTLINE

Film I--The Four-Jaw Independent Chuck: Selected Related Information

Concepts. This film presents the selection of the correct chuck for the anticipated job on selected work pieces and preparing and mounting the chuck on the lathe headstock spindle.

Anticipated pupil understanding. The following are understandings a pupil should acquire:

1. The student should be able to select the proper chuck to handle jobs similar to that shown;
2. The student should know how to clean and oil the threads of the headstock spindle and chuck back plate;
3. The student should be able to properly mount the chuck on the headstock spindle.

Approach. This film shows the selection of the chuck for the job and the cleaning of chuck backplate threads and headstock spindle.

Selected preview assignments. Students planning to use these films to help them learn about the skill of using a four-jaw chuck might first learn the items below. The degree of knowledge should be determined by the instructor:

1. The names of lathe parts and their function;
2. The oiling and cleaning procedure for the lathe.

Film sequence. The following are the scenes of this film:

1. Title;
2. Selecting the chuck--selecting the chuck which will best handle the job presented by the materials;
3. Mounting the chuck--cleaning and mounting the chuck on the lathe.

Suggestions to the teacher. Use the film as a springboard for your own demonstration on the use of the four-jaw independent chuck. Ask students to demonstrate the operations shown in the film. Use questions, such as the ones below, for discussion topics after the film has been shown:

1. Why is it better to use a four-jaw chuck to chuck rough stock?
2. Why clean and oil matching machined surfaces

before putting them together?

Film II--The Four-Jaw Independent Chuck: Selected Chucking Setups

Concepts. This film shows two methods of centering stock, internal chucking and reversing the jaws to accommodate large stock in the four-jaw independent chuck.

Anticipated pupil understanding. The following are understandings a pupil should acquire:

1. The student should learn to rough center the stock by the use of the concentric circles on the face of the chuck before he starts the lathe;
2. The student should learn to center the stock within a few thousandths of an inch by the chalk method;
3. The student should learn to reverse the chuck jaws so that it can handle larger stock;
4. The student should learn to chuck short work internally if the piece has a sufficiently large hole to accept the chuck jaws.

Approach. This film shows the proper use of the

four-jaw independent chuck for the following jobs:

1. The external chucking of a small round rod;
2. The internal chucking of a short piece of tubing;
3. The external chucking of a rectangular plate to allow boring of a hole.

Suggested preview assignments. Students planning to use this film to help them learn about the skill of using a four-jaw chuck might first learn the items below. The degree of knowledge should be determined by the instructor:

1. The names of lathe parts and their function;
2. The oiling cleaning procedure for the lathe;
3. How to sharpen the lathe tools for the material and jobs the student will be working with;
4. The cutting speed, feed, and depth of cut.

Film sequences: the following are the scenes of this film:

1. Chucking a round rod--rough centering a round rod by use of the concentric circles and close centering by the chalk method;
2. Internal chucking--checking the material size against the size of the chuck and reversing the chuck jaws to fit a large rectangular plate.

Chuck the rectangular plate with a hole to be bored;

3. Reversing jaws--internal chucking of a short piece of tubing. External turning of the tubing.

Suggestions to the teacher. The films may be used as a springboard for your own demonstration on the use of the four-jaw independent chuck. Students might be asked to demonstrate the operations shown in the film to the remainder of the class. Questions, such as the ones below, might be used for discussion topics after the film has been shown:

1. How can stock be centered in a four-jaw independent chuck?

2. Did you notice any good safety practices used in this film?

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

A number of authors whose writings appear in the current literature feel strongly that eight millimeter film will be used extensively for education in the future. Time will verify or disprove these feelings. There are several signs which these people point to in order to justify their statements. These signs include new equipment, better equipment and the awareness of some educators to the educational possibilities of these new technological developments.

Commercially the home movie market has grown and stimulated much growth in the eight millimeter field. Conferences such as the one reported by L. Forsdale (14) and eight millimeter local production classes as reported by Doris Stapley (28) have stimulated the growth of eight millimeter film in education. Periodic publication of "'8', A Newsletter of 8 mm Film in Education", helps keep interested people up to date on the progress of eight millimeter films in education.

Local production of films is being encouraged. There are several reasons given for a busy teacher to produce his own films. One reason is that many topics are of a local nature and therefore not commercially profitable. Another reason, particularly apropros to eight millimeter single concept loop films, is that needed titles are not available. A teacher may produce a film even though he may not be a professional photographer because he does know how to present the material which he teaches.

One problem encountered in this study was to determine in advance the amount of material which could be adequately covered in a two to four minute film. Experience dealing with the single concept loop film would undoubtedly help correct this problem.

The author's film cost should not be used as an indication of probable film cost for local production unless several copies are to be made. Local production of single copies of eight millimeter can be shot on eight millimeter film. Eight millimeter color film retails at about $3.50 per fifty feet including processing. Having the film placed in a cartridge costs about $2.00. School prices should be somewhat less.

Conclusions

A teacher who has a film need should not hesitate to make his own. It would be expedient if the school or the teacher owned a camera, light meter, lights and the many other items that might be used to make a film. These, however, are not all necessary. In fact, a teacher may find that he does not have any of the items at hand and will need to borrow them. The primary needs can be met, depending on the filming situation, with a camera and light meter. Many modern cameras come with a built in automatic light meter, so that only one piece of equipment, the camera is necessary to begin filming.

Before filming a proposed title, a check should be made to determine if a commercially made film is available. Commercial prices for films are generally not much different than the cost of raw film from a retail store. Therefore, need and availability should both be considered before deciding to produce a film. Educational need, of course, is the prime prerequisite.

As previously reported, a problem was encountered limiting the material to go into a single loop film. The author's solution may be of use to others, that is,

simply divide the filmed material into smaller segments. Many loop films such as those in this study, really have more than one identifiable concept. The films could be broken down into 'single' concepts.

Several people whom the author talked to concerning single concept films voiced disapproval of the use of the term 'single' concept because many of the films deal with more than one concept, although closely related. This may be one reason there are so many names used by various authors when refering to this medium. However, many authors still use the term single concept films or single concept loop films.

There appears to be a need for experimentation concerning construction and use of the short loop films. Experimentation would, undoubtedly, make future films more useful.

Some of the areas of experimentation might deal with scene length or brevity; the use of titles and/or sub-titles; the number of reshowings needed for comprehension and whether certain scenes really explain what they were intended to tell.

The film title "The Four-Jaw Independent Chuck" was found to include several concepts not covered by the films. There are at least three further concepts

which might be developed from this title. They are: chucking work off center, chucking irregular shapes and accurate centering with a dial indicator.

It appears that teachers can make eight millimeter silent loop films as a local production. This was born out in the review of literature and demonstrated by the author's films. While eight millimeter film does not produce the same picture quality as that of sixteen millimeter, it is said to be adequate for most classroom viewing. The new, larger formats will undoubtedly improve picture quality by allowing more light through the picture frame to the screen and give an adequate picture size without enlarging the picture as many times.

Having the film placed in a plastic cartridge and the ends connected to form a loop can eliminate handling the film, threading the projector and rewinding the film. Eight millimeter silent loop films may allow the teacher to be more completely in command of the film and the teaching situation.

Modern filming and projection equipment, for eight millimeter film, makes operation simple enough so that any teacher can soon learn to use it. Therefore, any teacher who has an instruction problem which he

believes could be handled by film should consider producing the needed film.

TABLE I

COST ANALYSIS OF THE FILM

"THE USE OF THE FOUR-JAW INDEPENDENT CHUCK"

4	16mm Kodachrome II Film	$7.05	$28.20
4	Prepaid film development mailer	2.00	8.00
4	Postage	.50	2.00
1	Burlap	1.38	1.38
1	Scotch Brand Double Stick Tape	.49	.49
1	Pair white cotton gloves	.38	.38
6	Film copies	6.75	40.50
6	Cartridges	1.25	7.50
	Postage, insurance and handling		4.06
	Total cost		$92.51

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