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AN INVESTIGATION OF THE VALUE
OF TRAINING FILMS IN TEACHING
INDUSTRIAL SKILLS TO ADULTS

Thesis for the Degree of M. A.
MICHIGAN STATE COLLEGE
Eldon Robbins
1945

THIS

This is to certify that the
thesis entitled

AN INVESTIGATION OF THE VALUE OF TRAIN-
ING FILMS IN TEACHING INDUSTRIAL SKILLS
TO ADULTS

presented by

ELDON ROBBINS

has been accepted towards fulfillment
of the requirements for

M. A. degree in EDUCATION

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**AN INVESTIGATION OF THE VALUE OF TRAINING FILMS
IN TEACHING INDUSTRIAL SKILLS TO ADULTS**

BY

Eldon Robbins

A THESIS

**Submitted to the Graduate School of Michigan
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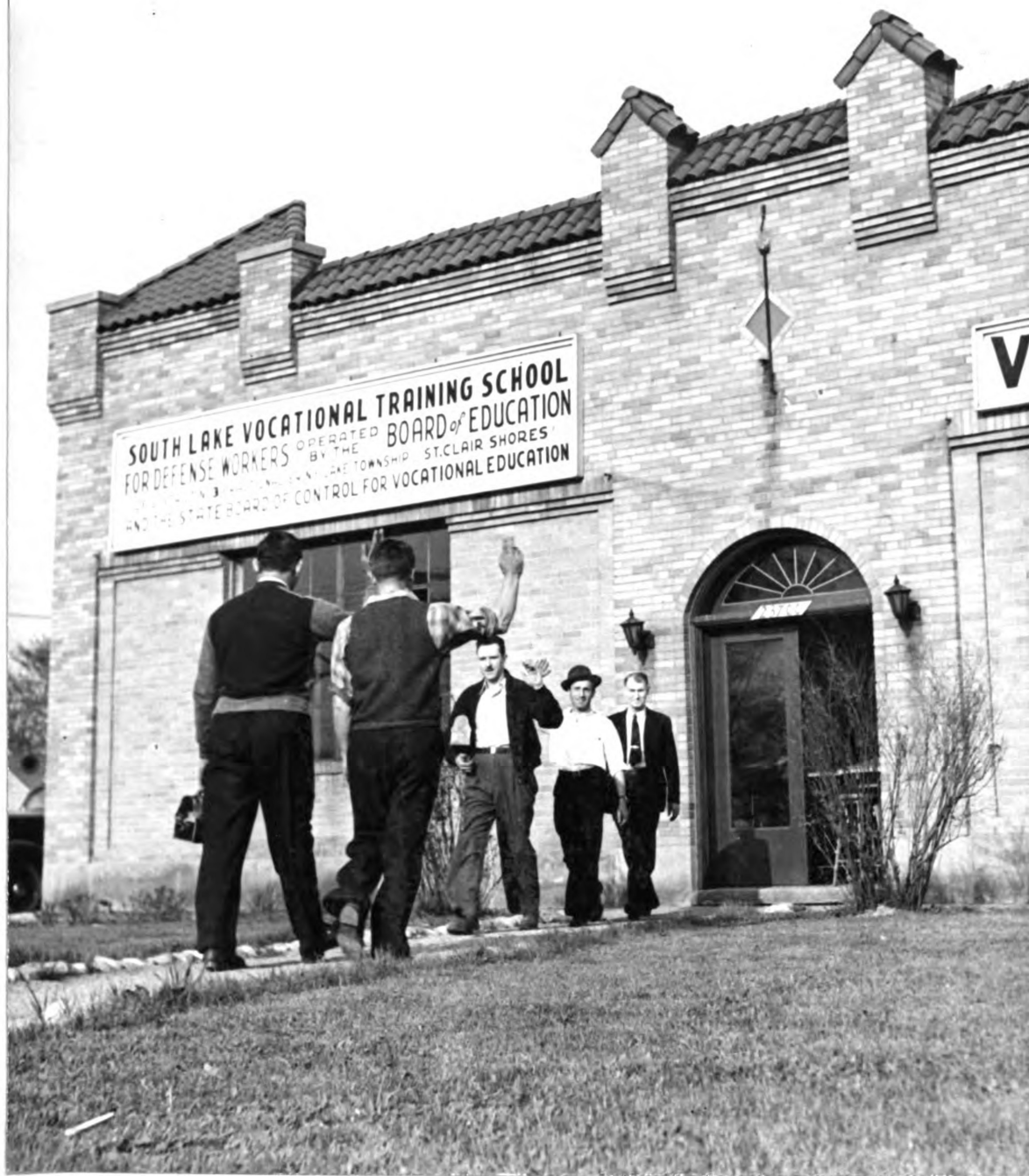


FIGURE 1

WAR WORKERS ATTENDING A VOCATIONAL SCHOOL TO LEARN NEW JOB SKILLS

CHAPTER I

THE PROBLEM

One of the many amazing accomplishments of the United States during the war years, 1940-44, was the quick and efficient training of millions of men and women who achieved near-miracles of production on the home front and who won astounding victories on the fighting front. Training was a "bottleneck" in 1939, months before Pearl Harbor shocked the Nation into full realization that a world war was raging and America was in it.

To the armed forces, training was the keystone in the bridge between civilian and soldier, a bridge over which millions of men from all walks of life were to pass. To industry, training was one of the "bottlenecks" that had to be broken if America were to become the arsenal for the United Nations.

It is significant that during this national emergency there was more teaching of adults with films than at any other time. All branches of the armed forces utilized training films extensively to help teach the most vital lesson of all - how to meet the enemy and kill him before he killed you. To meet the needs for production of hundreds of training films and to provide leadership for instructors in effective utilization of the new teaching aids, the various

branches of the armed forces organized special units to produce and to promote the use of films for instruction.

Rapid expansion and conversion of American industry for all-out production of war material created the need for training millions of workers for these new war industries. Of these millions, some came from the ranks of the unemployed, some from industries converting from the manufacture of peacetime products to the goods of war, some from fields of business and professions hard hit by a wartime economy, and even housewives donned mechanics aprons before the war industries' gargantuan appetite for trained manpower was satiated.

The task of training this army for the production front quickly was a tremendous one and it was in this emergency that the nation's public vocational schools volunteered for action. Vocational Training For the National Defense began July 1, 1940 under the direction of the United States Office of Education and state and local departments of vocational education.

The need for speed in training large numbers of people quickly was urgent when the Nazis were sweeping everything before them on the European continent, but it became desperate after December 8, 1941, when the Japs launched their sneak attack upon Pearl Harbor. Overnight, Vocational Training For the National Defense became Vocational Training For War Production Workers.

As an aid to mass instruction for mass production of war material, the United States Office of Education began production of visual aids for war training and approximately thirty subjects in the field of machine tool operation and use of precision measuring instruments were available at the time of Pearl Harbor. These instructional aids were 16mm sound moving pictures with titles such as "Rough Turning Between Centers," "Cutting A Keyway on a Finished Shaft," "The Micrometer," "Vernier Scales," and "Height Gages and Standard Indicators."

The Office of Education training films were innovations among visual aids for vocational education, if not for general education, in that they were professionally produced under the supervision of vocational educators to accomplish a specific instructional purpose. The scope of each film was one unit of instruction, the content and coverage were based upon the learner's training and experience, and a pattern of instruction was a "built-in" feature of the film.

It was the writer's opportunity to introduce these training films to Michigan's vocational educators during the National Defense and War Training programs and to observe the reactions of trainees and instructors as the films were used for instruction in the training courses. There was little of the natural resistance to new instructional material, as might have been anticipated. Where projection facilities

were available, instructors utilized the films frequently and reported satisfactory results. Comments from trainees indicated that the films were helping them learn new skills faster.

As the war progressed, the drain upon the Nation's manpower increased and Vocational Training For War Production Workers was intensified. Courses were streamlined, hours of instruction reduced, and the training program was "sharpened-up" in every detail. The one goal was to develop specific vocational skills in a minimum of time and anything which did not lead directly toward that goal was eliminated from the program. It became necessary to justify the use of films for instruction in Vocational Training For War Production Workers.

From observation of training courses in Michigan, the writer was convinced that intelligent use of well designed training films, such as those produced by the U. S. Office of Education, was a justifiable expenditure of time in training war production workers. "Intelligent use" in this instance, included the practical application of commonly accepted techniques for effective utilization of instructional films.

Among other things, this meant that (1) the instructor should preview the film if he were not completely familiar with its contents, (2) the film should be correlated with the

subject being taught, (3) a learning situation should be created before presenting the film, (4) provisions should be made for a follow-up discussion of the film after showing, (5) the instructor should repeat the film if a second or third showing seemed advisable, and (6) not more than one film should be utilized during a training session and that film should not consume the major part of the instructional time.

Observance of instruction in Vocational Training For War Production Workers led the writer to the conclusion that even if one or two of the steps in the technique for proper use of training films were abused, the amount of learning would be as great, if not greater than if the trainees had not seen the films. This, because the inherent instructional quality of the training films was particularly noticeable when compared to the instructional efforts of an able mechanic with little experience in the classroom as he attempted to conduct a training program.

Statement of the problem. Briefly, the problem was to determine whether the amount of time required for effective utilization of training films, such as those produced by the United States Office of Education, was justified in Vocational Training For War Production Workers. If the trainees learned faster and remembered longer without visual aids for instruction, then the use of training films could not be justified.

The problem was to obtain evidence that would prove or disprove the effectiveness of training films as instructional aids in developing the skills desired in training war production workers.

Definitions of terms used. "Training films" may include a variety of types and sizes of films ranging from 16mm motion picture film to 3½x4½ glass slides. In this investigation, however, it is limited to one size and type of film, 16mm sound motion picture film.

"Audio-visual aids," or "visual aids" may be used interchangeably with "training film."

"Vocational skills" in this investigation refers to the occupational skills of Vocational Training For War Production Workers. In many instances, these have been called "single-skills," but this definition is misleading. Ability to operate a lathe may be a "single-skill" in the eyes of the master machinist, but lathe operation represents a variety of complicated skills to be learned by the beginner.

"Trainees" in all cases were adults enrolled in Vocational Training For War Production Workers.

Organization of thesis. The report of this investigation is presented in five Chapters and an Appendix. Chapter One presents the background and statement of the problem; Chapter Two is a review of related or pertinent literature;

Chapter Three explains the procedure of the investigation; Chapter Four describes the techniques used and results; and Chapter Five includes a summary and conclusions.

CHAPTER II

REVIEW OF PERTINENT LITERATURE

In searching for data to justify the use of training films in the streamlined program of Vocational Training For War Production Workers, the writer discovered that considerable research had been conducted since 1915 on the value of visual materials for instructional purposes. Some of the conclusions of this research were applicable in a general way to the immediate problem.

Reporting on the results of the University of Chicago study in 1924, Freeman¹ explained that the studies were intended to define in broad general terms the functions of the motion picture in instruction. He concluded that its superiority over other visual aids was determined to be the depiction of motion, and its place in the instructional procedure those learning situations in which "it is essential to grasp the nature of movement."

This point was verified by Hoban, Dale, Dunn, and Schneider² writing on "Motion Pictures in Education" in 1937.

¹Frank N. Freeman, A Comparative Study of Motion Pictures and Other Methods of Instruction, (University of Chicago Press, 1924.)

²Charles F. Hoban, Jr., Edgar Dale, Fannie Dunn, and Etta Schneider, Motion Pictures in Education, (H. W. Wilson Company, New York, 1937,) p. 308.

The depiction of motion--the motion of a workpiece or of a tool--was inherent in practically all phases of instruction in Vocational Training For War Production Workers and Freeman's conclusion was considered pertinent to the investigation. Later, McClusky¹ published an interesting comment on Freeman's conclusion.

He said, "Freeman's conclusion that the advantage of the motion picture in teaching lies in motion needs further elaboration. Another advantage of the motion picture as a teaching device lies in the fact that it may be constructed to present a flowing continuity of ideas. Motion makes it possible to relate one idea to another. In our normal thinking process, one never has an isolated idea, the counterpart of the still picture. The "stream of thought" is continually on the move. It may be that the motion picture secures its educative power from the fact that it is a counterpart of thought."²

While this conclusion and comment were interesting as generalizations that were coincident with observations by the

¹F. Dean McClusky, Visual Instruction: Its Values and Its Needs, (Mancall Publishing Corporation, 7 West 44th Street, New York City, 1932,) p. 24.

²This comparison of a "still picture" to an isolated idea would be hotly challenged by devotees of the sound slide-film who contend that a series of related pictures presented in continuity and with sound effects and commentary is superior to the motion picture for many instructional purposes.

writer, they did not provide the specific evidence needed in solving the problem at hand. An investigation of other research in the use of visual aids for instruction disclosed numerous studies none of which had a direct bearing upon the immediate problem.¹

¹A total of 113 research studies in visual aids for instruction were reported in the United States Office of Education Bibliographies of Research Studies in Education from 1937-1940. None pertained directly to the writer's problem.

CHAPTER III

PROCEDURE OF THE INVESTIGATION

Sources of data. In making the results of the investigation of the utmost value to the writer's problem, it was decided that, wherever possible, data should be obtained from the program of Vocational Training For War Production Workers. Three approaches to the problem of obtaining pertinent data were planned: (1) To measure the instructional value of sound motion pictures in teaching a group of adult women how to use a precision measuring tool, (2) To survey a group of vocational educators responsible for supervision of Vocational Training For War Production Workers to determine their opinion of instruction with films as conducted in their individual schools, and (3) To interview war workers who learned their job skills through Vocational Training For War Production Workers training courses in which training films were used.

Study of women war worker trainees. A group of fifty adult women were enrolled in Vocational Training For War Production Workers at Lansing Technical High School to learn the use of precision measuring tools so that they might qualify for positions as inspectors of precision machined parts in a Lansing war industry. One of the skills which they were to learn was the use of the micrometer. A training film, THE MICROMETER, had been produced by the U. S. Office of Education

to help teach this skill. The film was available for instruction at Lansing Technical High School and permission was granted by Maurice Pancost, director of the school, to make use of this situation for the purposes of the investigation.

Questionnaire survey of vocational instructors.... An opportunity to obtain the concensus of a representative group of Michigan directors and supervisors of vocational education presented itself during the¹⁹⁴³ Annual Summer Conference of Directors, Supervisors, and Co-ordinators of Vocational Education. Programs of Vocational Training For War Production Workers were in progress in all of the cities represented at the Conference and training films had been used in the courses of instruction.

A questionnaire was prepared to obtain the opinion of these attending the Trade and Industrial Education Division meetings of the conference regarding the value of training films in the instruction of adults for occupational skills in war industries. In addition to this information, questions were included to determine the extent to which films were being used and the degree of effective use being made of them.

Follow-up interview of trainees. In order to obtain the trainee's reaction to the value of training films in learning occupational skills, one hundred and fifty war production workers who were trained for their jobs through

Vocational Training For War Production Workers were interviewed in three Michigan cities to determine whether films were used as training aids and, if so, to obtain the trainee's estimate of their value as learning aids.



FIGURE 2

THE TEST GROUP TAKES PRACTICE READING WITH MICROMETERS

CHAPTER IV

TECHNIQUES AND RESULTS OF THE INVESTIGATIONS

Part One

Study of Women War Worker Trainees. A course in Inspection Techniques in the program of Vocational Training For War Production Workers at Lansing Technical High School was attracting a regular enrollment of adult women from the community and nearby areas and one of these groups of trainees was selected for a brief, intensive study of the value of a training film in learning an occupational skill.

One of the first skills which was to be acquired in the course in Inspection Techniques was the use of the micrometer. Not only would skill with the micrometer be needed by the trainee, but many of the operational skills for effective use of the micrometer are related to the correct use of other precision measuring tools, such as vernier calipers and height gages.

In learning to use the micrometer, it was essential that the trainee understand the theory and manipulation of the tool. A knowledge of the parts and their relation to one another was held to be important. Familiarity with addition and subtraction of decimals was required. Skill in manipulating the tool was referred to as acquiring the "feel" of

the micrometer and this was deemed highly essential to effective utilization of the tool.

By arrangement with the instructors of the course in Inspection Techniques, it was agreed that the micrometer would be the first subject presented after the formalities of enrollment and the informalities of "getting acquainted" were dispensed with. The first step in the procedure was to obtain some uniformity of experience regarding micrometers and, for the purpose of the study, each trainee was queried regarding her knowledge of the tool and only those who indicated that they had no knowledge of the instrument were selected for the investigation. The information as to who had been selected for the study or that a study was to be made was not divulged.

The hour of meeting provided the basis for determining the Test and Control Groups. Those attending the course from 6:00 P.M. to 9:00 P.M. were designated as the Control Group and those attending on the second shift, from 9:00 P.M. to 12:00 midnight, were the Test Group. Ten women who indicated no previous knowledge of the micrometer were selected from each group and data pertaining to them were gathered.

The study was planned to cover six hours of instruction, three hours a day for two days, and the instruction in both the Control and Test Groups was to be similar except that the sound motion picture, THE MICROMETER, was to be utilized as an instructional aid for the Test Group.

The learning of the two groups was measured at two intervals, at the conclusion of each day's instruction, and the first test was a measure of the amount of learning concerning the theory of and information about the micrometer, as accomplished by the Hunter Test. The second test was a practical measurement of the learning which had taken place at the conclusion of six hours of instruction and it consisted of testing for speed and accuracy in obtaining the precise measurements of ten steel plugs which had been accurately machined and carefully calibrated.

Early during the first day's instruction, the Test Group was informed that it was about to witness a sound motion picture which would help them understand better one of the precision measuring tools they were to learn to use. The group then saw the film, THE MICROMETER, and this first showing was followed by a discussion in which key points of the film were emphasized. There was a second showing of the film after which the group witnessed a demonstration with a large model micrometer and then practiced manipulation of micrometers by taking measurements of objects. The Hunter Test concluded the first day's instruction.

On the second day, the Test Group saw the film, THE MICROMETER, at the beginning of the session and returned to further practice on taking measurements with micrometers.

The practical test for speed and accuracy of measuring ten precision ground plugs was given during the sixth hour of instruction.

The first day's instruction for the Control Group consisted of a general discussion of the course with emphasis upon the need for acquiring skill with the micrometer. This was followed by a lecture and demonstration with a large model micrometer. The trainees were then given micrometers and practiced taking measurements with them until the Hunter Micrometer Test was given as a conclusion of the first three hours of instruction.

There was a review of the first day's instruction presented by the instructor at the beginning of the second day followed by a lecture on the importance of acquiring the "feel" of the micrometer. This key point was demonstrated and micrometers were made available to the trainees for practice prior to the test for speed and accuracy on the ten precision ground plugs. Unfortunately, the instructor permitted the Control Group to practice measuring the test plugs, but no record was kept of the readings and it was decided to continue with the test as originally planned.

Before the training course was completed, each trainee took the Otis Quick Scoring Mental Ability Test and the results were incorporated in the final compilation of data.

Results of Study of Women War Worker Trainees. A comparison of the recorded ages and scores on the Mental Ability Test indicated considerable uniformity of the Test and Control Groups. The average age of the Test Group was 32 years and the average of the Control Group was 32.1 years. The Median of the Test Group was 29 years and the Median of the Control Group was 30.5 years.

The average score of the Control Group on the Mental Ability Test was 99.6 and that of the Test Group was 101.9. A high score of 112 was reported from the Control Group as compared to a high score of 111 from the Test Group. The Median for the Test Group was 102.5 and the Median for the Control Group was 98.

There was but little difference between the records of the two groups on the Hunter Micrometer Test, a test designed to measure the trainee's knowledge of the theory of the micrometer. The average score for the Test Group was 43.9 and that of the Control Group was 41.4. The Median Score for the Control Group was 40 and the Median for the Test Group was 44.1.

It was in the practical test at the conclusion of the six hours of instruction that the greatest variation between the two groups was discovered. The test results were indicated by two sets of scores, the Time in Minutes required to take

the ten readings, and the number of Correct Readings. These scores were combined to determine the average Seconds Per Correct Reading for each trainee. For example, Trainee T-E obtained 10 correct readings in six minutes - an average of 36 Seconds Per Correct Reading (see Table III, Page 23). Ages and Test Scores for the Test Group are tabulated in Table I, Page 21; and similar information is tabulated for the Control Group in Table II, Page 22.

A comparison of the Seconds Per Correct Reading for the two groups indicated that the Test Group was 34.3 per cent faster and more accurate than the Control Group, an important point as speed and accuracy are key points in the instruction of trainees for inspection techniques under production methods.

The Mean Score for the Test Group was 47.9 seconds per correct reading. Q_3 for the Test Group was 33.3 seconds per correct reading. The Mean Score for the Control Group was 72.9 seconds per correct reading and Q_3 for this group was 42.4 seconds per correct reading.

The Standard Deviation from the Mean for the Test Group was 44.2 and SD for the Control Group was 18.35. Table III, Page 23, includes a comparison and summarization of Test Group and Control Group Scores.

TABLE I
TABULATION OF TEST SCORES AND AGES OF TEST GROUP

Trainee	Age	Hunter Test	Intelligence Quotient	Correct Readings*	Time in Minutes*
T-A	47	53	111	8	7
T-B	29	52	110	9	5
T-C	29	47	105	9	5
T-D	43	45	103	9	10
T-E	28	45	103	10	6
T-F	26	44	102	7	4½
T-G	37	42	100	9	4
T-H	31	40	98	7	8
T-I	22	38	96	7	10
T-J	28	33	91	10	7
Total	320	439	1,019	85	66.5
Average	32	43.9	101.9	8.5	6.6
Median	29	44.5	102.5	8.5	6.5

*Results of test in measuring Outside Dimensions of Precision Ground Plugs.

TABLE II
TABULATION OF TEST SCORES AND AGES OF CONTROL GROUP

Trainee	Age	Hunter Test	Intelligence Quotient	Correct Readings*	Time in Minutes*
C-A	37	54	112	7	5
C-B	27	51	109	4	13
C-C	41	50	108	9	5
C-D	39	47	105	6	9½
C-E	23	40	98	6	8½
C-F	30	40	98	8	7½
C-G	28	38	96	10	7
C-H	34	36	96	5	5
C-I	42	29	87	5	5
C-J	20	29	87	8	8
Total	321	414	996	68	73.5
Average	32.1	41.4	99.6	6.8	7.3
Median	30.5	40.	98	6.5	7.25

*Results of test in measuring Outside Dimensions of Precision Ground Plugs.

TABLE III

COMPARISON OF CONTROL GROUP AND TEST GROUP SCORES
FROM TEST FOR SPEED AND ACCURACY IN USING MICROMETER

T e s t G r o u p		C o n t r o l G r o u p	
Trainee	Seconds Per Reading*	Trainee	Seconds Per Reading*
T-A	52.5	C-A	42.8
T-B	33.3	C-B	195.
T-C	33.3	C-C	33.3
T-D	66.6	C-D	95.
T-E	36.	C-E	85.
T-F	38.5	C-F	56.2
T-G	26.6	C-G	42.
T-H	68.5	C-H	60.
T-I	81.7	C-I	60.
T-J	42.	C-J	60.
Total	479.		729.3

*For purposes of comparison, it was necessary to combine the Correct Readings and Time in Minutes into Seconds Per Reading. Thus, the combined speed and accuracy of the Test Group (479) is 34 per cent better than the combined speed and accuracy of the Control Group (729.3.)

TABLE III
SUMMARIZATION
SCORES ARRANGED ACCORDING TO SECONDS PER READING

T e s t G r o u p		C o n t r o l G r o u p	
	81.7		195.
	68.5		95.
Q ₁ - 67.5	66.6	Q ₁ - 90.	85.
	52.5		60.
Q ₃ - 33.3	42.	Q ₃ - 42.4	60.
	38.5		60.
Q - 17.1	36.	Q - 23.8	56.2
	33.3		42.8
	33.3		42.
	26.6		33.3
Total	479.	Total	729.3
Mean	47.9	Mean	72.9
SD	18.35	SD	44.2



FIGURE 3

SKILL WITH THE MICROMETER IS NEEDED BY THIS WAR WORKER

Part Two

Questionnaire Survey of Instructors. In preparing the questionnaire to be submitted to local directors, supervisors, and co-ordinators of trade and industrial education at the 1943 Annual Summer Training Conference to obtain their consensus of the value of training films for instruction in Vocational Training For War Production Workers, a total of twenty-one questions were selected. These questions were divided into three catagories: Administration, Techniques, and Evaluation.

The purpose of the questions listed under "Administration" was to determine the extent to which training films had been used. The queries under "Techniques" were designed to obtain information about the manner in which instructors were utilizing films as learning aids and the questions under "Evaluation" were aimed at obtaining the consensus of the group regarding the value of training films in Vocational Training For War Production Workers judging from their personal observation and contacts with instructors and trainees in the classes.

Thirty directors, supervisors, and co-ordinators of trade and industrial education completed the questionnaires that were presented to the group and these thirty persons represented twenty-six of Michigan's largest cities, including Detroit, Grand Rapids, Lansing, Saginaw, Jackson, Battle Creek, and Kalamazoo. All of the cities represented were conducting

programs of Vocational Training For War Production Workers and records of the Audio-Visual Aids Service of the Michigan State Board of Control For Vocational Education revealed that all of these cities were using training films for instruction in the war training classes.

The questionnaires were presented as a part of the writer's participation in one of the sessions of the training conference and, for the purpose of clarity and to assure that the questions would be answered, each query was read aloud and those responding to the questionnaire were asked to comment if the meaning of the question were not fully understood. It was discovered that further explanation was needed for several questions in order to clarify the intent of the question--and this in spite of the fact that considerable time and thought had been expended in preparing the questions to obtain brevity and simplicity.

The writer, however, was satisfied after presenting the questionnaire to the group that those who answered the questions understood the intent of the queries.

Results of the Questionnaire Survey. The following four questions were asked under the heading of "Administration:" (1) What types of film projection equipment are available? (2) Is this equipment available for use as needed? (3) Are projection facilities satisfactory? and (4) Are films available as needed?

In response to the first question 89 per cent reported 16mm sound motion picture projection equipment available, 32 per cent reported 16mm silent motion picture projectors, 21 per cent had 35mm sound slidefilm projectors, 39 per cent reported 35mm silent slidefilm projectors, 39 per cent were equipped with 2x2 inch slide projectors, and 43 per cent had 3½x4½ inch slide projection equipment.

Only 4 per cent declared their film projection equipment was not "usually" or "always" available when needed. Forty-six per cent reported equipment "always" available and 50 per cent said it was "usually" available when needed.

Two-thirds of the group were satisfied with their projection room facilities, 16 per cent called them "fair" and an equal number termed their rooms as "unsatisfactory" for projection of films.

In response to the question "Are films available as needed?" 16 per cent of the group said "always," 72 per cent reported "usually" and 11 per cent said "seldom."

Seven questions were asked under the heading of "Techniques." These were: (1) Are films previewed by instructor? (2) How many films are used during an instructional period? (3) At what stage of instruction are films used? (4) Are films repeated for each group? (5) How frequently are training films used? (6) Does a discussion follow the

showing of a film? and (7) Are the films correlated with the instruction?

Twenty-seven per cent of the group reported that training films were "always" previewed by the instructor before showing them to the trainees, 70 per cent said they were previewed "usually" and one member declared previewing as "seldom."

More than half of the group, 59 per cent, said one film was used during an instructional period, 33 per cent reported an average of two films for the instructional period, and two members declared that from one to three were used, depending on the subject.

Training films were used at most stages of instruction, according to the responses to this query. Twenty-eight per cent reported films used "at all stages of instruction" and an equal number said, "when a skill is being mastered." Seven per cent reported films used to "introduce a subject" and the remainder of the responses indicated the use of films at combinations of instructional stages.

A majority, 53 per cent, declared that "usually" each film was shown more than once to a group of trainees, 11 per cent said films were repeated "always" and 36 per cent reported repeated showing as "seldom."

In response to the query regarding the frequency of use for training films 42 per cent said "once a week," 8 per

cent said "each instructional period," 8 per cent reported "alternate instructional periods," and 15 per cent used them "once a month," 23 per cent said "as often as needed," and one member used them "seldom."

A discussion followed the showing of the film "always," according to 50 per cent of the responses to this question. One member reported "no discussion" and 45 per cent said a follow-up discussion was the "usual" procedure.

Twenty-eight per cent reported films were correlated with the instruction "always," 65 per cent said correlation was "usual" and two members of the group reported correlation to instruction "if possible."

The first of the nine questions under the heading "Evaluation" pertained to the most desirable length for a training film and the replies ranged from 10 minutes to 30 minutes, with the average of all responses being 16½ minutes. A fifteen-minute training film was preferred with the most frequency and twenty-minute films were the second choice. Only four in the group were of the opinion that a training film should have a running time of more than twenty minutes.

An evaluation of the organization of U. S. Office of Education produced training films from the standpoint of desirable instructional procedure was requested and 57 per cent of the group rated the film organization as "Excellent" and 43 per cent termed them "Satisfactory." The basic

organization of U. S. Office of Education training films was explained as: (1) Introduction to the subject or operation to be shown, (2) Step-by-step development of the operation, and (3) Summarization of the key points in the operation.

The question of the amount of class time which should be utilized for visual aids resulted in a variety of responses ranging from 100 per cent to 10 per cent of the instructional period. The average of the responses was 32 per cent of instruction time and 25 per cent was mentioned with the greatest frequency. One person suggested that 100 per cent of the class period should be utilized for visual aids and two were of the opinion that not more than 10 per cent of the time for instruction should be used for films.

The observed reaction of trainees and instructors toward U. S. Office of Education training films was asked and opinion was evenly divided as to whether those using the films were "enthusiastic" about them or "interested." One member of the group reported that trainees occasionally "disliked" some of the films shown.

The sound motion picture was rated as the type of training film best suited to meet the needs of the vocational teacher by 60 per cent of the group. The sound slidefilm was rated highest by 20 per cent and the silent slidefilm received a first place rating by 20 per cent. Five members of the group were of the opinion that the sound motion picture and

sound slidefilm were equally superior to other types of films and two members rated the sound motion picture and silent slidefilm as "best."

There was little preference as to the age level of trainees at which training films were most effective; 42 per cent said "in-school youth," 46 per cent said "adults," 14 per cent said "out-of-school youth," and the remainder were of the opinion that there was little or no difference.

Opinion was equally divided on the question of whether training films were more effective with men or women. One-third of the group reported films to be equally effective with men and women, 17 per cent declared them to be more effective with men, 21 per cent said they were more effective with women trainees, and the remainder were undecided.

Aeronautics, Aircraft Identification, Auto Mechanics, Foremanship Training, Drafting, Electronics, Engines, Electrical Trades, Machine Tool Operation, Plastics, Production Methods, Related Subjects For Apprentices, Sheet Metal Processes, Skilled Handicraft, Technique of Radio, Use of Tools, and Welding were listed as subjects of first importance in the production of new training films.



FIGURE 4

THE PARTS OF THE MICROMETER ARE EXPLAINED TO THE CONTROL GROUP

Part Three

Follow-up Interview of Trainees. An opportunity to obtain information regarding the reactions of the trainees toward the use of films for instruction in Vocational Training For War Production Workers occurred when a War Production Workers Follow-Up Study was authorized. Adult war production workers who had been trained for their jobs through Vocational Training For War Production Workers were interviewed in four selected areas in Michigan: Detroit, Jackson, Grand Rapids, and Iron Mountain.

By arrangement with those conducting the interviews, nine questions pertaining to the value of films for instruction in war training were asked of one hundred and sixty war production workers. The first question asked was whether or not visual aids had been utilized in the training program. The second question was designed to ascertain the extent to which films were used in training and the remaining seven queries were aimed at determining whether or not the worker considered the films of value and his reasons for his opinion.

To facilitate the interview, the most likely responses to the questions were keyed so that it was only necessary for the interviewer to mark down a number to record the response. If the reply were of an unusual nature, a note of the substance of the response was jotted on the questionnaire sheet.

Results of Follow-Up Interview of War Production

Workers. Of the one hundred and sixty war production workers interviewed, eighty-four reported that training films were utilized while they were learning their new skills through Vocational Training For War Production Workers. Of this group of eighty-four, eighty-two declared the training films were a definite help in learning and two said they were not.

When asked to explain how training films helped during the learning period, twenty-eight said they were helpful in all ways, twenty-three said the films helped them understand the step-by-step procedure in learning a new job, eighteen said films were most helpful in mastering new manipulations, eleven said films helped them most in understanding the mathematics of the job, eight stressed the importance of safety as the principal value of the films, six said they were able to learn the operations faster, and five declared that the films were of most value because they provided background information for learning the operation of other types of machines.

The two workers who questioned the value of training films explained their reasons. One found the subject matter of the films too difficult to comprehend and the other preferred to learn by working at the machine rather than spending any time on seeing training films.

Four of the eighty-four interviewed were of the opinion that the discussion following the showing of the films was inadequate. Seventy-two were satisfied with the follow-up discussion and eight did not have an opinion.

Thirty persons were of the opinion that they would have liked to have seen the films again during the training period. Forty did not believe this was necessary, and eight did not express themselves on this point.

Of the thirty who would have liked to have seen the films repeated, twenty-four said they missed key points of the film during the first showing. One thought the film "went too fast" and one was unable to understand the voice of the commentator.

Six persons had suggestions to improve the use of training films in courses of Vocational Training For War Production Workers. Two were of the opinion that the films should be repeated after the trainee had worked on the machine. One requested more repeat showings and suggested slowing the tempo of the film. One declared that the voice of the commentator in the films should be "clearer," and another requested films on blueprint reading. One complained that men in the classes were treated as schoolboys.

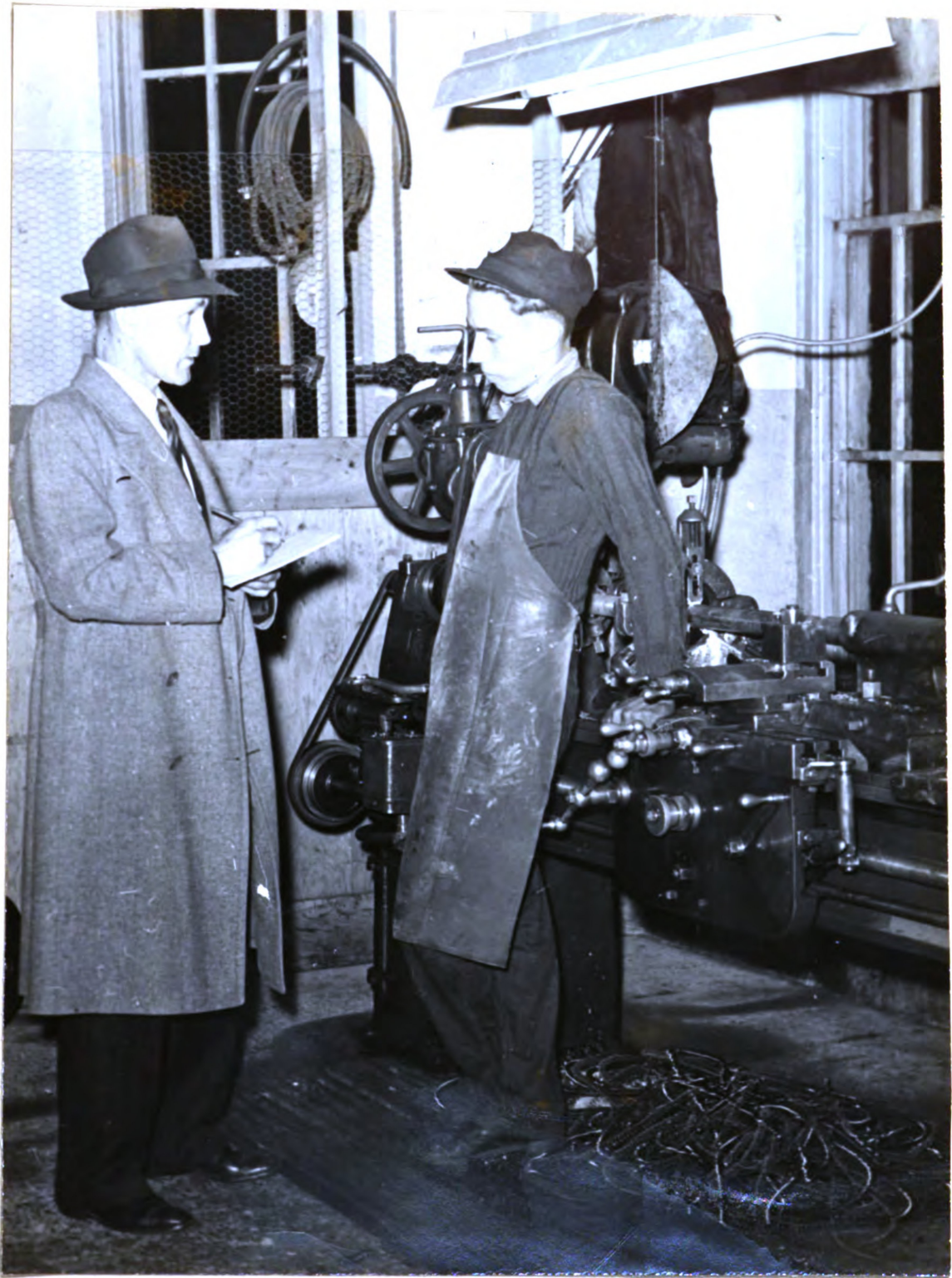


FIGURE 5

AN INTERVIEWER VISITS A WAR WORKER ON THE JOB TO OBTAIN INFORMATION

CHAPTER V

SUMMARY AND CONCLUSIONS

At the conclusion of the investigation, the accumulated evidence weighed rather heavily in favor of training films as efficient instructional aids for teaching adults new skills in the program of Vocational Training For War Production Workers. It was strikingly apparent to the writer, however, that the field for further investigation regarding the value of training films as instructional aids had not been exhausted. Also, more of the limitations of the investigation were evident than at the beginning.

Summarization of the Study of Women War Worker Trainees.

Fifty women war worker trainees enrolled in Vocational Training For War Production Workers at Lansing Technical High School in a course of Inspection of Precision Machined Parts were required to master the use of the micrometer in measuring to within extremely close limits. In teaching this skill, a controlled study was arranged in which the trainees were divided into two groups for six hours of instruction on the use of the micrometer.

Except for the utilization of the training film, THE MICROMETER, the instruction was kept as uniform as was practical under the circumstances and those who reported previous knowledge of the micrometer were excluded from the study.

Three tests were given, a Mental Ability Test, the Hunter Micrometer Test, and a manipulatory test of a practical nature to determine the degree of skill and accuracy acquired under conditions approximating war production conditions.

The Mental Ability Test disclosed considerable uniformity of the two groups as measured by this type of testing device. There was but little difference between the scores of the two groups on the Hunter Micrometer Test, a test designed to gage the trainee's knowledge of the theory of the micrometer. It was in the practical test for skill and accuracy, however, that the greatest variation between the two groups was noted.

A comparison of the seconds required to obtain each correct reading of the micrometer indicated that the group which had been instructed with the training film was 34.3 per cent faster and more accurate than the group which had not seen the film.

Limitations of the Study of Women War Worker Trainees.

As viewed by the writer, there were three principal limitations to the Study: (1) The smallness of the two groups, (2) The presence of two personalities in presenting the instruction, and (3) The error of the instructor of the Control Group in permitting practice with the testing material. These, however, were not considered as of sufficient importance to invalidate the results of the Study.

Conclusions From the Study of Women War Worker Trainees.

It was the conclusion of the writer that the Study revealed the value of the training film as an instructional aid in helping trainees acquire a skill which was one of the principal objectives of this portion of the training program. The practical skill of speed and accuracy in use of the micrometer in taking close measurements of precision machined parts was a major goal of instruction in the course. The fact that the Test Group showed a marked superiority in this skill was important evidence to establish the value of training films for instruction of adults in Vocational Training For War Production Workers.

Summarization of the Questionnaire Survey of Instructors.

Twenty-one questions pertaining to Administration, Techniques of Utilization, and Evaluation of training films were presented to thirty directors, supervisors, and co-ordinators of vocational education representing twenty-six of Michigan's largest cities in which programs of Vocational Training For War Production Workers had been conducted. The purpose of the questionnaire was to obtain the concensus of these educators regarding the value of training films as instructional aids for adults in war training courses on the basis of their first-hand observation and experiences.

The replies to the Questionnaire disclosed that the facilities for utilizing training films in courses of

Vocational Training For War Production Workers were satisfactory. Projection equipment was available, projection rooms were satisfactory and films were on hand when needed, in the majority of instances.

There was evidence that desirable techniques of teaching with films had been used. Films were previewed by the instructors before using them as instructional aids, the number of films utilized during an instructional period was limited to one or two, films were repeated more frequently than not, and training films were utilized as instructional aids at least once a week in the majority of instances. A follow-up discussion of the visual aid was reported as the normal technique for instruction, and correlation with the instruction was reported.

There were four key points included in the section under Evaluation: (1) The evaluation of the training films used by those reporting, (2) The consensus of the group regarding the amount of time during the instructional period which should be utilized in teaching with a training film, (3) The observed reaction of instructors toward training films as instructional aids, and (4) The observed reaction of the trainees toward films for instruction.

Replies to these four key points provided pertinent data regarding the principal objective of the investigation, to ascertain the value of training films as teaching aids for

adult vocational education. It was the consensus of the group that, on the average, 32 per cent of instructional time should be allocated to the utilization of training films as instructional aids. In reporting the observed reaction of trainees and instructors toward training films that had been used for instruction, the replies were equally divided between "enthusiastic" and "approve" with none indicating "dislike" or "consider time wasted."

The evaluation of the training films most frequently used as instructional aids in Vocational Training For War Production Workers, films produced by the U. S. Office of Education, resulted in responses divided quite evenly between "excellent" and "satisfactory." None considered the material to be "acceptable" or "unsatisfactory."

Limitations of the Questionnaire Survey of Instructors.

In the opinion of the writer, there were two limitations of the survey: (1) The lack of replies from more instructors, and (2) the lack of replies from trainees. The first limitation was somewhat offset by the fact that those who replied were in close contact with classroom instruction as they were supervisors of the program. The second limiting factor was removed by the third phase of the investigation, an interview survey of war production workers who had been trained through Vocational Training programs.

Conclusions From the Questionnaire Survey of Instructors.

On the basis of the replies to the questionnaire survey of these directors, supervisors, and co-ordinators of vocational education, there could be but one conclusion drawn regarding the value of training films in Vocational Education For War Production Workers--that the films were being used frequently, that they were being presented effectively, and that the instructional results were satisfactory.

Summarization of Follow-Up Interview of Trainees. As a part of a follow-up study of Vocational Training For War Production Workers in which workers in war industries who had been trained through the program were interviewed, nine questions were asked regarding the value of training films if these instructional aids had been utilized in the training program.

Of a total of one hundred and sixty war workers who had learned their job skills through war training courses in the public schools, eighty-four reported that films had been used during the course of instruction. Eighty-two of these were of the opinion that they had been helped in their learning by the films and most of these mentioned specific ways in which the films had been of value.

Limitations of the Follow-Up Interview of Trainees.

Although the number of responses in the follow-up survey of

war production workers was limited, this factor does not invalidate the survey because of the selected sampling method utilized. It is the writer's opinion that the follow-up interview is the most satisfactory source of data of the three phases of the investigation.

Conclusions From the Follow-Up Interview of Trainees.

It is the conclusion of the writer that the follow-up interview corroborates the observations of the supervisors as reported in the questionnaire survey, that trainees were most favorably impressed with training films as instructional aids and that they were being utilized effectively.

Conclusions From The Investigation. Following study and evaluation of the data obtained from the three phases of the investigation and with due regard for the limitations of each phase, the writer is of the opinion that the evidence obtained can be interpreted by the following general conclusions:

(1) Effective utilization of a training film which is designed as an instructional aid for a specific unit of instruction in teaching a vocational skill results in faster learning on the part of the trainee.

(2) Where well made training films are used effectively, adults prefer them as instructional aids in learning vocational skills.

(3) The use of training films in Vocational Training For War Production Workers in Michigan public schools is justified on the basis of more effective learning on the part of the adult trainees.



FIGURE 6

WHEN INTERVIEWED, WOMEN WAR WORKERS EXPRESSED APPROVAL OF TRAINING FILMS

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APPENDIX

APPENDIX A

COMMENTARY FOR THE TRAINING FILM, THE MICROMETER

The most important measuring tool in machine shop work is the micrometer caliper used to measure variations in size too small for the human eye to see.

Different types of micrometers are used to measure inside widths or diameters, outside lengths or thicknesses, and the depth of holes or cuts, but the principle used by each is the same.

The micrometer caliper used in measuring thickness or outside length has a sturdy frame on which is mounted a hardened steel anvil. This frame supports the barrel which has a scale graduated in 25 one-thousandths of an inch. Inside this barrel is an internal screw. Engaging the barrel screw is one end of a hardened steel spindle. The thimble is part of the spindle assembly and contains a scale graduated to represent one one-thousandth of an inch for each division.

The micrometer uses the principle of the screw to control the movement of the spindle. The screw has forty threads to the inch. Forty turns of the spindle move in one inch; therefore, one complete turn of the spindle moves it exactly one-fortieth of an inch. One-fortieth of an inch is .025--25-thousandths.

The barrel is marked off in divisions, each of which represents a 25-thousandths movement of the spindle. Remember, one turn of the spindle moves it 25-thousandths of an inch. If we take the full distance around the thread and make a straight line of it and divide that line into 25 equal parts or divisions, we will have a simple illustration of the scale which encircles the thimble. It is apparent that each division represents one twenty-fifth of the travel of the screw as it makes one complete turn. Since one complete turn makes the spindle travel twenty-five-thousandths of an inch, it is evident that each division represents $(1/25)$ of (.025) or (.001) of an inch. Each division on the thimble, therefore, represents a spindle travel of one one-thousandth.

The scale on the barrel is graduated in 25-thousandths of an inch. Each turn of the thimble moves the spindle the distance of one graduation. Each fourth graduation is

numbered. Four times 25-thousandths equals 100-thousandths. The zeros are dropped in order to make the scale easier to read. The complete scale on this micrometer shows that it has a range of 10 times 100-thousandths or 1000-thousandths or one inch.

Micrometers come in standard sizes designated by the largest opening of the micrometer and in steps of one inch. Most sizes, however, measure only one inch in thousandths. The one-inch micrometer measures from zero to one inch in thousandths, the two-inch from one to two in thousandths, and the three-inch from two to three in thousandths, and so on.

The most commonly used micrometer is the one-inch. Here the thimble is being turned to bring the spindle into contact with the work. The measurement is read by first reading the number fully visible on the barrel--this is six. Remember that each of these figures should be read in hundreds--therefore, it is 600 one-thousandths. Beyond the six mark there is visible another graduation--this gives us 25-thousandths. On the thimble scale is shown the graduation that has stopped on the index line--the one one-thousandth graduation. The full reading is .626--six hundred and twenty-six-thousandths.

The ability to take accurate measurements with a micrometer depends on skill in its use. There is a "feel" to a micrometer that tells the skilled workman when he is using the right pressure in turning the thimble. Precise measurement can result only through proper use of the micrometer and constant practice is the only way to acquire the necessary skill--to acquire the right "feel." Until the operator is skilled in the use of the micrometer he may measure the same piece at the same point and get different readings. Constant practice will develop the skill necessary to obtain uniform readings. Gentle pressure of the thumb and index finger on the thimble is sufficient to bring the spindle into contact with the work. As the spindle reaches the work the drag of the fingers over the knurled surface of the thimble tells the operator when he uses the right pressure.

The micrometer is a sensitive instrument for precision measurement and must be used with care. The good operator does not use it like a C-clamp, swing it around when changing the setting, lay it where it can drop to the floor or where it can pick up abrasive particles or dirt. These things affect the accuracy of the instrument.

Before using the micrometer the careful operator removes all burrs and nicks from the work. The good operator makes sure that anvil and spindle are free of dirt or chips. The diameter of the shaft which has been measured is determined by referring first to the scale on the barrel. The figure 7 indicates .700. Two more graduations are seen. That's another .050, which is 50-thousandths. On the thimble scale the No. 1 graduation registers opposite the barrel index. That's .001. The diameter of the shaft is .751. Several places are gaged with the micrometer to check the diameter through the entire length of the shaft.

The standard micrometer, in experienced hands, will give accurate measurements to one-half of one one-thousandths, or finer. Micrometers are often used in measuring two or more thicknesses of material. Since the combined thickness here is more than one inch, a two-inch micrometer is employed. The figure that appears on the barrel scale is 7--or 700 thousandths. Then two full graduations of .025 each--that's 50-thousandths. The zero on the thimble scale is exactly on the index line on the barrel. Remember, a two-inch micrometer is being used, so one inch must be added. The total is 1.750.

All micrometer calipers should be checked frequently, making sure that the zero line on the thimble lines up with the barrel index. Those larger than one-inch should be checked with special standards or gage blocks. A two-inch micrometer is checked with a one-inch standard. When the micrometer is closed down over the standard with just the right tension and "feel" it should register zero. A three-inch micrometer is checked with a two-inch standard. Larger instruments are checked with correspondingly larger standards.

A companion tool to the outside micrometer is the inside micrometer. On the inside micrometer the jaws or points expand to fit the part to be measured. The micrometer is held square with the inside surfaces of the work and the measurement taken across the center of the hole. Another type of inside micrometer uses rods to measure the diameter of large holes. Rods of various lengths are inserted in the instrument according to the size of the hole to be measured. Accurate measurements of very large bores can be taken with this convenient tool.

Other convenient tools for measuring internal diameters in medium-sized holes are telescoping gages, which are shaped like the letter "T." One arm is movable; a screw locks it in place. It's often used for checking the diameter of cylinder bores and other deep holes. The setting of the telescoping gage is measured by an outside micrometer.

Another type of micrometer is used for the accurate measurement of the depth of holes, slots and other depressions below surface locations. The depth micrometer has a slender rod that reaches easily into small holes and slots. Rods of various lengths adapt the instrument to measuring holes of various depths.

Micrometers and micrometer measuring tools are used in every machine shop. If the micrometer principle is understood these instruments are easy to read. If the right type of micrometer is selected, accurate measurements can be taken for outside measurements, and for inside measurements, and for depth measurements as well. If they are kept clean and used properly on work clean and free from burrs, they will give the precise measurements that make modern mass production possible.

All micrometers are precision tools and the good operator takes pride in his ability to use them properly. He knows that the thimble should not turn too freely or too tightly and that the anvil and spindle must be kept separated to prevent corrosion, and that they must be kept in adjustment to assure accurate readings. The good operator gives them this care, oiling them to prevent rust and corrosion and keeping them in a protected place.

APPENDIX B

RESULTS OF QUESTIONNAIRE ON UTILIZATION OF TRAINING FILMS IN VOCATIONAL TRAINING FOR WAR WORKERS

(Questionnaire presented to a group of thirty directors, supervisors, and coordinators of trade and industrial education attending a training conference at Higgins Lake, Michigan, July 22, 1943.)

Cities Represented

Albion	Kalamazoo
Ann Arbor	Lansing
Battle Creek	Lincoln Park
Buchanan	Manistee
Detroit	Manistique
Dearborn	Monroe
Flint	Muskegon
Grand Haven	Mt. Pleasant
Grand Rapids	Northville
Hastings	Pontiac
Highland Park	Port Huron
Holland	Saginaw
Jackson	Wyandotte

Administration

1. What types of film projection equipment are available?

16mm Sound Movie	25	89%
16mm Silent Movie	9	32
35mm Sound Slidefilm	6	21
35mm Silent Slidefilm	11	39
2"x2" Slide Projector (Miniature)	11	39
3½"x4½" Slide Projector (Standard)	12	43

2. Is this equipment available for use AS NEEDED?

Always	13*	46%
Usually	14	50
Seldom	1	4

Comments:

*Is scheduled from text-book room (Highland Park)

3. Are projection room facilities satisfactory?

Satisfactory	19*	66%
Unsatisfactory	4**	16
Fair	4***	16

Comments:

*Adding Daylight Screens (Highland Park)

**No acoustics, poor blackout, no shades (Wyandotte)

**Could have better room at high school (Hastings)

**One center is satisfactory, one is not (Jackson)

**Only partially (Northville)

***Generally so (Detroit)

4. Are films available AS NEEDED?

Always	4*	16%
Usually	21**	72
Seldom	3	12

Comments:

*Mostly from own library (Pontiac)

*Sometimes have to double-up classes (Highland Park)

**Own films always available (Kalamazoo)

**Have complete library (Dearborn-Fordson)

Techniques

1. Are films previewed by instructors?

Always	8*	27%
Usually	21	70
Seldom	1	3

Comments:

- *Is not always the instructor (Albion)
- *Sometimes by Supervisor (Detroit)
- *With Visual Aids Head (Highland Park)
- *First time film is shown at school (Battle Creek)
- *Always by supervisor, try to have instructors (Detroit)

2. How many films are used during an instructional period (average?)

One	16	59%
Two	9	33
Three	0	0
Other	2	8

Comments:

- If closely related may use more (Northville)
- Sometimes two (Battle Creek and Lansing)
- Never more than two (Ann Arbor)
- Sometimes make a return (Highland Park)
- One to three (Jackson)
- One, two or three, depending on subject (Grand Haven)

3. At what stage of instruction are films used?

To introduce a subject	2	7%
When a skill is being mastered	8	28
To review an operation	0	0
To introduce a subject and review an operation	7	23
At all stages of instruction	8	28
To introduce a subject and when a skill is being mastered	2	7
When a skill is being mastered and to review an operation	2	7

Comments:

- Depends on subject (Pontiac)
- Depends on group (Pontiac)

4. Are films repeated for each group?

Always	3	11%
Usually	15*	53
Seldom	10**	36

Comments:

*Hope to more (Battle Creek)

**Always, with own films (Kalamazoo)
If needed (Highland Park)

5. How frequently are training films used?

Each instructional period	2	8%
Alternate instructional periods	2	8
Once a week	12*	42
Once a month	4**	15
As often as needed	6	23
Seldom	1	4

Comments:

*Depends on number of times class meets (Detroit)

*As needed and requested by instructor (Saginaw)

**Sometimes twice a month (Port Huron, St. Clair)
Varies with availability of film (Lansing)
Various times (Albion)
Varies according to instructor (Detroit)

6. Does a discussion follow the showing of a film?

Always	14*	50%
Usually	13*	45
Seldom	0	0
No	1	5

Comments:

*If possible (Battle Creek)

**During showing of slidefilm only (Detroit)
Varies with instructor (Kalamazoo)

7. Are the films correlated with the instruction?

Always	8	28%
Usually	19	65
Seldom	0	0
If Possible	2	7

Evaluation

1. What is the most desirable length training film?

5 minutes	0
10 minutes	3
10 to 15 minutes	1
10 to 20 minutes	2**
10 to 30 minutes	1
12 to 15 minutes	1
15 minutes	8
15 to 20 minutes	3
15 to 30 minutes	1
Not over 15 minutes	1
20 minutes	5*
20 to 30 minutes	1
30 minutes	1
45 minutes	0

Average desirable length - 16½ minutes

Comments:

*According to subject and availability (Lansing)

**Over 20 too long (Northville)

2. Most training films sponsored by the Office of Education follow the following organizations: (1) Introduction to subject; (2) Step-by-step explanation of subject; (3) Summarization. How do you rate this method of organization for instructional purposes?

Excellent	16*	57%
Satisfactory	12**	43
Acceptable	0	0
Unsatisfactory	0	0

Comments:

*Sometimes too long (Highland Park)

*No. 3 step most important (Northville)

**Steps 1 and 3 excellent, and Step 2 satisfactory (Hastings)

3. Assuming suitable instructional films are available, what per cent of instructional time should be allocated to the use of films as learning aids?

10 per cent	2
15	2
20	1*

20 - 30 per cent	2
25	6**
25 - 35	1
30	3
33 1/3	2***
33 1/3 - 50	1
50	4****
100	1

Average time--32 per cent

Comments:

- *Including discussion (Wyandotte)
- **Or a little more (Jackson)
- **Maximum (Lansing)
- **For 3 hour class, depends on subject (Battle Creek)
- ***For 1 hour class (Manistee and Grand Haven)
- ****For 3 hour class (Grand Haven)

4. What is the reaction of the majority of trainees toward Office of Education film? (Precision Measurement, Lathe, Milling Machine, etc.)

Enthusiastic	52. %*
Interested	47.6**
Dislike	.002

Comments:

- *Most films are tops (Northville)
- **Like, but are anxious to run machines (Grand Haven)

5. What is the reaction of instructors who have used Office of Education films? (If reaction not uniform, indicate per cent)

Enthusiastic	48%
Approve	52*
Consider time wasted	0

Comments:

- *Like them very much (Saginaw)
- *Enthusiastic about some (Grand Haven)

6. What type of training film do you consider best suited to the needs of the vocational teacher?

Sound Slidefilm	6	20%
Silent Slidefilm	6	20
Sound Motion Picture	19	60
Silent Motion Picture	0	0
Glass Slides	0	0

Comments:

Depends on subject being presented (Kalamazoo)
 Sound Motion picture and sound slidefilm equal (5 reports)
 Sound motion picture and silent slidefilm equal (2 reports)
 Sound motion pictures and silent slidefilm, 1st;
 sound slidefilm, 2nd; silent motion picture, 3rd and
 glass slides, 4th (Detroit)
 Sound motion pictures, 1st, and sound slidefilm, 2nd
 (Flint and Hastings)
 Sound motion pictures, 1st, and silent slidefilm, 2nd
 (Battle Creek)
 Silent slidefilm, 1st, and sound motion picture, 2nd
 (Manistique)
 Sound motion pictures, 1st; sound slidefilm, 2nd;
 other types equal (movie and slidefilm each excel in
 their place) (Lansing)
 All have their place (Monroe)
 Depends on type of instruction (Grand Haven)

7. What subject should be considered in the production of new training films? (List in order of importance.)

1. Aeronautic
 - Aircraft Identification
 - Auto Mechanics
 - Better Foremanship Training
 - Drafting
 - Electronics
 - Engines
 - Electrical Trades
 - Foremanship
 - Machine Tool Operation
 - Plastics
 - Production Methods
 - Related subjects for Apprentices
 - Sheet Metal Processes
 - Skilled Handicraft
 - Technique of Radio
 - Use of Tools
 - Welding (Additional)--2 requests
2. Acetylene Welding (Newer)
 - Aircraft (2 reports)
 - Auto Mechanics
 - Employee and Employer Relations
 - Heat Treating
 - Interview for Job
 - Hydraulics (2 reports)
 - Machine Operation
 - Machine Shoppe

Map Making
 Plastic Manufacturing
 Radio
 Welding

3. Air Geography
 Automotive
 Electric end of radio
 Electronics
 Hydraulics
 Hygiene
 Operations
 Tool Grinding
 Use of Machines
 Welding--Gas and Arc

4. Actual Induction into Work
 Purpose of Hobbies
 Welding

8. At what age level are the present Office of Education training films most effective?

In-school Youth	12*	42%
Out-of-school Youth	4	14
Adults	13	46
Not much difference	1	4
No difference	3	7

Comments:

*Because instructor is prepared for presentation

9. Are training films more effective with men or women?

More effective with men	5	17%
More effective with women	6	21
Same	10	34
Unknown	8*	28

Comments:

*New on job (Newberry)

*No equipment (Calumet)

APPENDIX C

RESULTS OF INTERVIEWS FROM FOLLOW-UP STUDY OF WAR PRODUCTION WORKERS

1. Did you have an opportunity to see any motion pictures to help you in your training?

Yes	84
No	<u>76</u>
	160

2. Do you think these films helped you?

Yes	82
No	<u>2</u>
	84

3. Just how did these films help?

In all ways	28
Step-by-step procedures in going about a job	23
Manipulations	18
Helped understand mathematics of the job	11
Importance of safety on the job	8
Learn operations faster	6
Background for other machines	5

4. What was disliked about films?

Material too hard, didn't understand	1
Rather do the job than see films	1

5. Did you have enough discussion following the films?

Yes	72
No	4
No answer received	8

6. Would you have liked to have seen some of the films again?

Yes	30
No	40
No answer received	14

7. Why certain films were desired to be seen again.

No answer received	4
Missed some points first time	24
Didn't understand the voice	1
Film went too fast	1

8. Suggestions made.

- (1) Show films after working awhile on the job
- (2) Have a series of subjects on blueprint reading
- (3) If those films could be seen now after having run the shop machines for two or three months, trainee felt she would get a lot more out of the movie
- (4) Clearer sound would be more desirable
- (5) Men in class were treated as schoolboys, if men have the background they should be so treated
- (6) Cut speed of film and repeat use (helpful in use of riveting gun)

Ag 6 1964
13. 41 44

ACORN USE ONLY

25 55
Jul 25 34

1967

Jun 6 '48

Jun 5 '49

Jun 2 '49

Aug. 21 '49

Dec 15 '49

Feb 12 '50

Dec 11 '50

10 '51

Nov 15 '51

~~41 17 '51~~

41 17 '51

41 6 '51

MY 11 '54

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