A SURVEY OF THE STATUS OF ONE-MAN INDUSTRIAL ARTS GENERAL SHOP DEPARTMENTS, AT THE JUNIOR HIGH SCHOOL LEVEL, IN MICHIGAN

> Thesis for the Degree of M. A. MICHIGAN STATE COLLEGE John M. Shemick 1951



This is to certify that the

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A SURVEY OF THE STATUS OF ONE-MAN INDUSTRIAL ARTS GENERAL SHOP DEPARTMENTS, AT THE JUNIOR HIGH SCHOOL LEVEL, IN MICHIGAN

By

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A THESIS

Submitted to the School of Graduate Studies of Michigan State College of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

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CHAPTER I

THE PROBLEM, PURPOSES, AND DEFINITIONS OF TERMS USED

Introduction

The development of the industrial arts general shop has been the result of two basic situations.¹ The first situation arose in schools with relatively small enrollments which, in turn, excluded justification or available funds for several unit shops. Therefore, in order to offer an extensive program of industrial arts the general shop was reluctantly accepted as the only recourse. The second situation evolved in schools which desired to coordinate learning activities in order to give the pupil an opportunity to comprehend the inter-relationship between the industries represented by the several areas of industrial arts. A greater variety of experiences was considered advantageous in preparing pupils to meet life's problems.

¹ Emanuel E. Ericson, <u>Teaching the Industrial Arts</u> (Peoria, Illinois: The Manual Arts Press, 1946), p. 303.

The latter situation seemed to fulfill the aims of industrial arts as a phase of general education. Industrial arts, as a phase of general education, has gained more and more acceptance through the years. To what extent have schools organized industrial arts education into general shop programs—programs offering the opportunity of exploratory experiences and coordinated learning activities? The status of the industrial arts teacher of Michigan has been investigated, but the status of the industrial arts general shop has been left unexplored.² This thesis deals with the inquiry undertaken to discover the status of the industrial arts general shop in Michigan at the 7-8-9 grade levels.

The Problem

<u>Statement of the problem</u>. This survey was undertaken to reveal the status of the one-man industrial arts general shop departments, at the junior high school level, in Michigan, in conjunction with the relationship, if any, between the preparation

² "Studies in Industrial Education," Bulletin No. 4 (Washington, D. C.: American Vocational Association, Inc., 1949), pp. 1-143.

of teachers in the areas of industrial arts, and the relative emphasis of those areas taught in the general shop programs.

Importance of the survey. Little or no information has been compiled about the status of junior high school level industrial arts general shops in Michigan.³ Educators in Michigan have been preparing men to fill industrial arts general shop teaching positions for many years. However, these educators and state administrators have had no over-all concrete data, on a state-wide basis, as to what these teachers have been doing in actual practice. This survey was undertaken in the hope that it would reveal those practices which might aid in teacher preparation as well as being of value to administrators of industrial education.

The Purposes

The purposes of this survey are to determine:

- A. The status of the industrial arts general shop teacher in terms of:
 - 1. educational attainment,

³ <u>Loc</u>. <u>cit</u>.

- a. degrees held (or special certificate),
- b. postgraduate credit;
- 2. major and minor fields of concentration;
- 3. subjects taught other than industrial arts;
- 4. the types and number of extra-class activities directed;
- 5. extensiveness and emphasis of formal preparation in the areas of industrial arts;
- 6. industrial experience to determine its effect upon the general shop program.
- B. The status of the junior high school industrial arts general shop in terms of:
 - 1. the type of class organization employed;
 - the extent to which industrial arts is offered at this level and whether it is required for girls as well as boys;
 - number of schools offering industrial arts courses to girls;
 - the differences of class-work offered girls if girls are included in the program;
 - 5. the extensiveness and relative emphasis given areas of industrial arts in the shop program in relation to the formal preparation of the teacher.

Definitions of Terms Used

Extensiveness and emphasis. "Extensiveness" was interpreted as meaning the number of areas of industrial arts offered in a general shop program. "Emphasis" was accepted as meaning the relative time spent in the pursuit of any given area in the general shop program. The whole term was interpreted as meaning the scope and depth of any school's program and the scope and depth of any teacher's industrial arts preparation.

General education. The guidance given in developing the understanding and abilities needed by people as they meet every-day situations of living, may be thought of as general education. 4

<u>General shop</u>. Ericson has pointed out two basic types of general shops—comprehensive and limited—and that there were three classifications of comprehensive shops.⁵ For the purposes of the survey the term "general shop" was interpreted

⁴ Florence B. Stratemeyer and others, <u>Developing A</u> <u>Curriculum for Modern Living</u> (New York: Bureau of Publications, Teachers College, Columbia University, 1947), p. 362.

Emanuel E. Ericson, loc. cit.

as meaning any industrial arts shop with two or more definite and distinct areas of instruction of industrial arts offered within a single course of its program. Throughout the remaining part of the thesis the term "general shop" is to be interpreted as an industrial arts general shop unless otherwise indicated.

Industrial arts. Industrial arts is the particular phase of general education founded upon values acquired through manipulative activity in areas of a technological nature. Emphasis is placed upon exploration and related information derived from those activities of exploration rather than the proficiency required of various skills.⁶

Junior high school level. The junior high school level includes grades seven through eight or nine. Only schools which had one or more grades at the junior high school level were used in the survey and the term "school" was used in that sense in the remaining part of the survey.

One-man industrial arts general shop departments. The one-man industrial arts general shop department was accepted

Homer J. Smith and others, "Improving Instruction in Industrial Arts" (Washington, D. C.: American Vocational Association, Inc., 1946), p. 50.

as meaning a situation where the industrial arts department was comprised of one teacher who conducted general shop classes.

The Delimiting Criteria

The limitations placed upon this survey, as indicated in the title, and subsequent definitions were placed in the survey because it was necessary to select schools which had programs reflecting the experience and preparation of their industrial arts teachers. One-man departments were assumed to possess the greatest freedom in the organization of their programs. In each case one teacher was primarily responsible for the extensiveness and emphasis of the program. In those cases there was an opportunity to examine and determine the extent to which the preparation and experience of the teacher had affected the program.

The general shop limitation was selected because of the various possible area combinations that could be taught in a shop in comparison to the various area combinations of the teacher's preparation and industrial experience, if any.

The junior high school level was selected because at this level industrial arts exists in its most diversified form.⁷ The general shop represents the most diversified form of industrial arts; therefore, general shops should occur at the junior high school level with the greatest frequency. At higher levels skill receives more attention which, in turn, embraces the unit shop program more than the general shop program.⁸ On this basis, grades ten through twelve were excluded from the survey.

Organization of Remainder of the Thesis

Chapter II will deal with the instruments and procedures used in making the survey. Chapter III will be a presentation of the data compiled by the use of a post-card questionnaire in discovering the number and types of industrial arts programs in Michigan. In Chapter IV there will be an analysis of data compiled by the use of a questionnaire designed to satisfy the purposes of this survey. Results of interviews with people who

⁷ Emanuel E. Ericson, <u>op</u>. <u>cit</u>., p. 255.

⁸ Verne C. Fryklund, "Trade and Job Analysis" (Milwaukee: The Bruce Publishing Co., 1950), p. 10.

represented groups used in the survey are treated in Chapter V. The summary, conclusions, implications, and areas for further study are contained in Chapter VI.

CHAPTER II

INSTRUMENTS AND PROCEDURES USED

Post-card Questionnaire and Follow-up

The instrument to be used to locate the schools with one-man general shop departments had to insure the greatest possible accuracy. This was necessary because the remaining part of the survey hinged upon the results. The questionnairetype instrument was selected because it could be used to contact a large number of people. The shortcomings of such an instrument were realized to be those of developing cooperation on the part of the recipient and motivating him to return the necessary information. A post-card-type questionnaire was prepared and designed to require as little effort on the part of the recipient as possible and informed him of the importance of the survey. The attributes of the questionnaire were: (1) it was addressed directly to the person for whom it was intended; (2) bold-face type was used for ease of reading; (3) the items could be answered by check-marks or the writing of numbers; (4) the whole questionnaire could be read and answered in a very short time; and (5) although a great many questionnaires were used, each had the personal signature of the investigator (see Appendix, Section 1).

The questionnaires were sent to the principals whose names were selected from the Michigan Education Directory of 1950-1951. All principals whose schools included grades seven through nine were sent questionnaires; however, there were certain exceptions. An exception was made in those situations where there was a separate school for grades seven and eight and where the high school included grades nine through twelve. In those situations the high schools were not sent question-The other exceptions were in situations where the naires. elementary school included grades seven and eight, and the high school grades nine through twelve. In such instances the high school principal was sent a questionnaire. A follow-up post-card was sent, after two weeks had elapsed, to the principals who had not returned their copies of the questionnaire. The message on the card urged them to help make the survey

¹ "Michigan Education Director and Buyers Guide, 1950-1951" (Lansing, Michigan: Education Directories, Inc., 1950), pp. 1-177.

a success by returning the completed questionnaire as soon as possible (see Appendix, Section 2).

The Major Survey Instrument and Follow-up

The major survey instrument was a questionnaire designed to satisfy the purposes of the survey (see Appendix, Section 3). A letter of introduction was enclosed with the questionnaire (see Appendix, Section 4). It was prepared for the purpose of informing the recipient of the over-all purposes of the survey, as well as the importance of his participation. The same method was used in the composition of the introduction to the post-card questionnaire, i.e., the personalized directness of the address, salutation, and signature of the investigator. A return envelope was also enclosed with the questionnaire, which was addressed and had postage affixed.

The information obtained from the post-card questionnaire was used to send the major questionnaire to one-man general shop departments throughout the state. A follow-up card was sent to those teachers who had not returned the questionnaire by the time suggested in the letter of introduction (see Appendix, Section 5). The message on it was similar to the one used as a follow-up on the post-card questionnaire (see Appendix, Section 4).

Interviews

Interviewing was the method used to determine the validity of the survey instruments employed. It was necessary to devise a means of classifying the schools included in the The classification was necessary to make a represurvey. sentative sampling. The classifications used were those employed by the State Department of Public Instruction of Michigan² (see Table I). A fifty-mile radius around East Lansing was established as the traveling distance of a day. Several schools were visited in each classification on trips each day. Those cities which were alone in their classification were visited, although they were more than fifty miles away. Principals who had not returned the post-card questionnaire were interviewed to determine the effect their responses would have made had they returned their questionnaires. Teachers who

² "An Analysis of the Receipts and Expenditures of the Michigan Public Schools for 1948-1949" (Lansing, Michigan: Superintendent of Public Instruction, Bulletin No. 1011, 1950), p. 1.

TABLE I

	Classification	Number of Question- naires Received	Number of Question- naires Used	Number Inter- viewed
A .	500,000 and over	1	1	1
в.	100,000 to 500,000	0	0	0
C.	50,000 to 100,000	5	3	6
D.	25,000 to 50,000	8	8	5
E.	10,000 to 25,000	8	3	2
F.	2,500 to 10,000	26	12	7
G.	1,000 to 2,500	41	19	5
н.	Under 1,000 with six			
	or more teachers	60	44	9
Ι.	Rural Agricultural			
	Schools	8	5	3
J.	Township School Dis- tricts other than		2	-
	Rural Agricultural	12	8	2
K.	Under 1,000 with less than six teachers	0	0	
L.	Large districts outside			
	of corporate limits	11	7	2

CLASSIFICATION OF SCHOOL DISTRICT BASED ON GENERAL POPULATION¹

¹ Except for large districts outside of corporate limits, Rural Agricultural Schools, Township School Districts, and districts sending their children to other schools.

Adapted from "An Analysis of the Receipts and Expenditures of the Michigan Public Schools for 1948-1949," Bulletin No. 1011, Revised. had not returned the major questionnaires were also interviewed to determine the reason for the delay. Finally, some teachers in each school classification were interviewed to determine the accuracy of the questionnaires they had returned.

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CHAPTER III

PRESENTATION OF DATA COMPILED FROM POST-CARD QUESTIONNAIRES

Number of Questionnaires Employed and Returned

According to the data available in the Michigan Education Directory, there were 611 schools which were within the limits of the survey. The principal of each school was sent a post-card questionnaire in the manner described in Chapter II (see Appendix, Section 1). Of the 611 questionnaires sent to principals, four hundred seventy, or 76.6 per cent, were returned. A follow-up post-card was sent to the principals who had not returned the questionnaires sent to them (see Appendix, Section 2). Seventy-six, or 10 per cent, of the total completed questionnaires received were returned after the follow-up card was sent to those principals. There was no way to determine whether the follow-up was responsible for the return of those questionnaires or whether the questionnaires would have been returned even though no follow-up had been used. However, in four cases the principals requested another copy of the

questionnaire which would tend to indicate the follow-up had some effect upon the return of the questionnaires.

Number and Percentage of Schools With One-man General Shop Departments

The number of one-man general shop departments as compiled from four hundred seventy questionnaires returned was 270, or 57.5 per cent. This represented 44 per cent of all the schools sent questionnaires. The compiled data indicated that the average program had three classes per day. The subjects, other than industrial arts, which general shop instructors taught are treated in Chapter IV.

Number and Percentage of Teachers Engaged in Teaching General Shop at the Junior High School Level

Schools with general shop programs having more than one teacher in their departments were found to number one hundred six, or 17 per cent of the four hundred seventy schools whose principals responded. Therefore, the total number of schools offering general shop was 376, or 61 per cent of the schools sent questionnaires.

Schools With No General Shop

There were 93 schools whose principals indicated that they had no general shop program. A further breakdown revealed that of those 93 schools, 26 indicated they had no industrial arts teachers; twenty-two indicated they had no general shop program, but left the other items blank. In those two situations, 48 schools may, or may not, have had industrial arts programs.

Industrial Arts Teachers at the Junior High School Level

A compilation of the number of teachers in each type of program indicated that 672 teachers were active in 76.7 per cent of the junior high schools of Michigan. Algebraic computation revealed an <u>estimated</u> 884 industrial arts teachers at the junior high school level.

CHAPTER IV

ANALYSIS OF DATA COMPILED FROM MAJOR SURVEY INSTRUMENT

Number of Instruments Employed and Returned

The post-card questionnaire revealed that two hundred seventy of the programs in 76.7 per cent of the junior high school level schools had one-man general shop departments. Each man was sent a questionnaire containing items inquiring into his status as a general shop teacher and the status of his shop program (see Appendix, Section 3). Of the total 270 questionnaires sent, 180, or 68 per cent, were returned.

Major and Minor Fields of Concentration of General Shop Teachers as Undergraduates

<u>Major fields of concentration</u>. A tabulation of item one of the questionnaire revealed that 141 teachers studied industrial arts as their major field of concentration. Therefore, 78 per cent of the teachers may have chosen industrial arts as their first teaching choice. The remaining 22 per cent of the teachers indicated that they majored in other fields. Nine men majored in physical education, seven in agriculture or vocational agriculture, and twenty-two in other fields.

Minor fields of concentration. There were 104 minor field combinations which appeared in response to item four. However, for ease of tabulation the sixteen fields which appeared, singularly or in combination, were used to tally the fields the teachers indicated as their minor fields of concentration. The returned questionnaire revealed that there were 95 men who minored in social studies, 56 in the sciences, 32 in English, 29 in industrial arts, 28 in mathematics, 18 in physical education, 18 in agriculture, 10 in drafting, 7 in art, 4 in speech, 3 in farm shop, 3 in psychology, 1 each in Spanish and guidance, and 6 were not filled. The greatest tendency was toward two fields as a minor. Over 50 per cent of the teachers minored in either social studies, English, or science, or combinations of them. Industrial arts, physical education, mathematics, agriculture, or drafting were minor fields of concentration in 31 per cent of the cases. The 29 men who had minored in industrial arts may have selected industrial arts as their second teaching choice.

The Educational Attainment of General Shop Teachers

Number and percentage with degrees. Items 2, 3, and 5 of the questionnaire dealt with the educational attainment of general shop teachers. Of 178 industrial arts teachers, eleven stated that they held Bachelor of Arts degrees and one hundred twenty-five stated they held Bachelor of Science degrees. Two merely indicated that they held "Life Certificates." Two men stated that they held Master of Education degrees, eleven held Master of Arts degrees, three held Master of Science degrees, and one stated he had a "Masters." In all, seventeen men held Master's degrees. There was also a group of 19 men who did not state what degrees they held, if they had been granted any at all.

Undergraduate attainment. A tabulation of data from item two indicated that seven men had less than 120 semester hours of credit, 25 men had only one hundred twenty semester hours of credit, and thirteen indicated that they had only 192 term hours or 200 quarter hours of credit. Therefore, 21.6 per cent of the teachers who returned the questionnaire had the bare minimum of credit required for teaching. Since two men had only life certificates they were probably products of the old educational teacher-training programs and consequently had less than 120 semester hours of credit. There were seven teachers below the minimum of 120 semester hours of credit, as disclosed by item two. Yet, only four men stated that they had no degrees. If the two men with "life certificates" were added, the total was only six. A difference of one reveals that one of the men in the group of nineteen who did not indicate whether they had a degree must not have had the minimum required credit for teaching. Of course, there may have been men in the group who had no degrees, but appeared to have enough credit. They may have earned those credits, but whether they had graduated could not be determined.

For those men who had more than 120 semester hours or 200 quarter hours of credit a statistical analysis was made.¹ A median of 133 semester hours and a median of 221 quarter hours of credit was computed. However, in twenty-two of the cases teachers had misinterpreted the item and indicated only the hours of credit in industrial arts, and twenty-six only

Harry A. Greene, Jorgensen, and Gerberich, <u>Mea-</u> surement and <u>Evaluation</u> in the <u>Secondary School</u> (New York: Longmans, Green and Co., 1948), p. 528.

indicated the degree they had been granted. Those two situations represented 37 per cent of the total responses.

Postgraduate attainment. Tabulations of item three revealed that forty-five teachers had no postgraduate work to their credit, which represented 25 per cent of those who responded. A statistical analysis was undertaken to determine the median hours of credit attained by the remaining 75 per cent of the teachers who had responded to the item. The analysis disclosed that the median for those who had semester hours of credit was fifteen hours, and the median for those who had quarter hours of credit was 19.8 hours of credit. By converting the quarter hours into semester hours, those with credit under the guarter system had 13.2 semester hours of credit. Although the median for that group was two credit hours lower, it did not affect the over-all median, because there were only 17 men with credits under the quarter system compared with 104 with credit under the semester system. The over-all median of the two groups was found to be 14.8 semester hours of credit.
Subjects Taught by General Shop Teachers, Other Than Industrial Arts

Of those general shop instructors teaching other subjects, the tendency was toward one or two subject areas per teacher. The number of classes taught in each subject area was not de-There were 105 general shop instructors teaching termined. other subjects, or 59 per cent of the total who returned the questionnaire. For the sake of simplicity the subjects taught were grouped within six general categories. The number of teachers in each category was: mathematics, 24; science, 23; physical education, 23; social science, 21; subjects related to industrial arts such as drafting, crafts, farm mechanics, and blue-print reading, 17; agriculture or vocational agriculture, 14; principals of schools, 4; and other isolated or highly specialized subjects, 21. The subject areas of science, mathematics, and social science accounted for almost half, or 48 per cent, of the situations. This follows the tendency to acquire "minors" in those subject areas, as was revealed in the section discussing the frequency of minor fields of concentration.

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Extra-class Activities Directed by General Shop Teachers

Item seven of the major questionnaire inquired into what "extra-curricular activities" the teacher directed. In order to avoid possible confusion, the term "extra-curricular activities" was used in the questionnaire because it is commonly used to mean extra-class activities. Of the 178 teachers who responded to item seven, thirty-two, or 18 per cent, indicated that they did not direct any extra-class activities. The remaining 82 per cent, who indicated that they did direct extra-class activities, indicated activities which were of five general types. These were: (1) class sponsor or advisor; (2) club director; (3) coach of a sport; (4) director of some special events (plays, dances, or some phase of athletic events); and (5) director of school service groups (audio-visual department or student council). The relative number of teachers engaged in directing three of these types of extra-class activities were: 58 as class sponsor or advisor; 39 as club director; and 46 as coach of a sport. These three groups represented 64 per cent of those directing extra-class activities. Twenty-nine, or 13 per cent, of the teachers were directing extra-class activities which were of

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the school-service nature. The remaining 23 per cent were involved in extra-class activities peculiar only to the schools in which they occurred.

Types of Class Organization Employed

The questionnaires sent to general shop teachers contained descriptions of five possible types of class organization. There were several lines allowed for the teacher whose class organization was not described, to indicate the type of class organization he employed (see Appendix, Section 3).

Of the teachers who indicated the type of class organization they employed: (a) forty-one indicated the type they used was the type in which the pupils work in groups, and each group works in a different area of industrial arts with the groups rotating from time to time; (b) thirty-two teachers indicated the type of organization they used was one in which the pupils worked in groups, but each group was fluid, i.e., pupils passed from one group to another as they completed the work; (c) eighteen teachers indicated that their classes were organized in such a way as to have the whole class working in one area of industrial arts at a time, then shifted to another area; (d) forty-six teachers indicated that their classes were organized to have each pupil working on a different project, but each project involving several areas of industrial arts; (e) fifty-six teachers indicated that in their shop classes several areas of industrial arts were being pursued simultaneously and that the pupils moved from area to area as they completed the projects involving the area. There were only three teachers who indicated that they employed a class organization different from those described on the questionnaire.

The relative percentage of each type of organization as reported was as follows: (a) 21 per cent, (b) 16 per cent, (c) 9 per cent, (d) 23.5 per cent, (e) 27.5 per cent, and (f) 1.5 per cent. These percentages indicate that types (a), (d), and (e) constituted the greatest proportion of the types employed. Type (e) seems to have been employed in slightly more of the shops than either (a) or (d). Over 50 per cent of the teachers indicated that they employed either (d) or (e) types of organization in their classes.

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Status of Girls in Industrial Arts Programs

Items nine, ten, eleven, fourteen and fifteen in the questionnaire dealt with the status of girls in industrial arts programs. Item nine dealt specifically with girls in the general shop classes (see Appendix, Section 3). The responses to this item disclosed that in only 23 schools were there girls in the general shop classes, which represented 14 per cent of the total responses. Separate classes for girls occurred even less frequently, as responses to item ten revealed that only sixteen schools had separate shop classes for girls. The number represented 9.8 per cent of the total who responded to the item. Industrial arts as a required course for girls occurred in only 17 out of 168, or 10 per cent, of the cases. It was required for girls at grade seven in five cases, grade eight in four cases, grade nine in four cases, and in four cases at grades seven and eight. The cases in which industrial arts was required occurred slightly more frequently at grades seven and eight, rather than at nine. The teachers who indicated that girls were included in their programs disclosed that the shop class-work for the girls did not differ from that for boys in 21 of the cases. In the 19 cases where

it differed for girls, fourteen (the greatest number of cases) indicated that the difference was in areas covered. In eight of the cases the projects differed, and in nine the related information differed. In all, forty schools offered industrial arts of some sort to their girl pupils, or 24 per cent of the schools whose teachers responded.

Industrial Arts as a Required Course for Boys

Industrial arts was a required course for boys in 112 of the schools, or in 72 per centof the schools whose teachers responded to item twelve (see Appendix, Section 3). The grades at which boys were required to enroll in industrial arts were: four at seventh; fifteen at eighth; forty-two at both seventh and eighth; twenty at ninth; twelve at both eighth and ninth; and twenty in seventh, eighth and ninth. The grade at which industrial arts was required most frequently was the eighth. In 109 out of 140 cases, or 72 per cent, eighth grade boys were required to enroll in industrial arts classes. In 69 cases the seventh grade boys were required to take industrial arts. This represented 49 per cent of the total schools which had such a requirement. Grade Restrictions on Industrial Arts Classes

There were 166 responses to item thirteen which dealt with grade levels at which shop classes were restricted (see Appendix, Section 3). There were 78 teachers who indicated that there were no grade restrictions for their classes. However, 88 teachers indicated that their classes were restricted to a single grade level. Those 88 teachers represented 53 per cent of the total responses received on item thirteen. Of the 53 per cent, 18 cases restricted only the ninth grade shop to a single grade level.

The Relation of the General Shop Program to the Shop Teacher's Preparation

There were originally 180 questionnaires returned from general shop teachers; however, 68 of them, or 37.8 per cent, were not used for tabulating data for this phase of the survey (see Table I). They were not used because they had not been completed, or the areas indicated as being taught in the classes revealed it as being a unit type program. Implications drawn from the unused questionnaires are treated in Chapter VI.

All the figures indicated for credit hours of preparation in the areas listed were converted into terms of semester hours of credit because there were far more responses indicated as semester hours than any other (see Appendix, Section 3). The hours spent teaching any given area was expanded or reduced, as the responses warranted, to an assumed 90-hour semester. The relative emphasis of areas taught remained the same, but a common unit had to be selected. A statistical analysis was made of each area listed on the questionnaire, to determine the median or central tendency.² These medians were tabulated and represented median semester hours of preparation of 112 general shop teachers (see Table II). The hours spent by these teachers in teaching the areas listed were converted, as indicated above, and the medians were determined. The method used was the frequency of class-interval as was the data on teacher preparation. The figures tabulated were median hours spent teaching the areas of industrial arts on the basis of a 90-hour semester (see Table II).

A computation was undertaken to discover the correlation between the general shop teacher's formal preparation and

² <u>Loc. cit.</u>

TABLE II

MEDIANS OF PREPARATORY CREDITS AND TIME SPENT TEACHING IN AREAS OF THE GENERAL SHOP

Area	Number of Teachers With Prep- aration	Median Hours of Credit	Median Hours Taught	Per- centage of Teachers Teaching	Number of Teachers Teaching
Woodworking	112	7.38	35.89	100.0	112
Drafting	100	6.75	17.72	79. 0	79
Machine Shop	84	3.65	10.76	39.3	33
Auto-Mechanics	30	3.63	7.07	46.6	14
Printing	46	3.54	9.71	15.2	7
Design	28	3.46	7.25	28.6	8
Patternmaking	52	3.06	6.83	19.2	10
Electricity	77	2.69	11.10	84. 4	65
Carpentry	4 8	2.31	10.47	60.4	29
Ceramics	13	2.19	7.00	15. 4	2
Benchmetal	85	2.02	11.61	39.3	33
Plumbing	27	1.68	5.37	111.0	30
Artmetal	54	1.65	8.53	64.8	35
Sheetmetal	75	1.64	11.77	90. 4	68
Plastics	30	1.60	12.60	86.7	26
Textiles	5	-	-	-	0
Foundry	39	1.40	8. 43	15.4	6
Welding	63	1.37	9.25	53. 2	33
Metal-Forging	64	1.34	9.00	51.5	33
Leather work	26	1.01	6.93	61.6	16

-1

the relative time spent teaching the areas in his general shop. The formula used was Pearson's formula to determine the product-moment coefficient.³

$$r_{xy}^{2} = \frac{\left[N\Sigma XY - (\Sigma X)(\Sigma Y)\right]^{2}}{\left[N\Sigma X^{2} - (\Sigma X)^{2}\right]\left[N\Sigma Y^{2} - (\Sigma Y)^{2}\right]}$$

The product-moment coefficient was found to be +0.65 (see Figure 1). According to a rough description found in Guilford⁴ this coefficient denotes a "moderate correlation; substantial relationship." A further study was undertaken between the areas most frequently taught in the general shop and the formal preparation which the teacher had in those areas. The procedure was the same except the areas correlated were selected on the basis of the frequency of 33, or one-third of the shop programs indicated in the survey (see Table II). The number of areas taught by any one general shop teacher ranged from two to fifteen. In fifty per cent of the cases four to six areas were taught and the computed median was found to be

³ J. P. Guilford, <u>Fundamental</u> <u>Statistics</u> in <u>Psychology</u> and Education (McGraw-Hill Book Co., Inc., 1942), p. 204.

^t Ibid., p. 219.

FIGURE 1

COMPARISON BETWEEN THE EMPHASIS OF AREAS IN GENERAL SHOPS AND EMPHASIS OF TEACHER PREPARATION

Areas in General Shops

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Woodworking	Π	Ι		Ι				Ι		\prod						Π					Π	Π	Ι	Π		Π	Ī
Drafting	\prod	Γ	\prod	I		Δ								T			Ţ	\square	1	+	P	F	F	Ħ	T	T	
Machine Shop Work	\prod			Į	ľ								-1			Π	Τ	Π	T	Τ	Π		T			Τ	
Auto-Mechanics	Π			Ι				ł	1		T	Γ				Π	Τ	Π		Τ	Π	T	Τ	Π		Τ	
Printing	Π			I			X											Π			Π	T	Τ	Π		Τ	
Design						Ţ		1									Ι				Π	Τ	Τ	Π	Τ	Π	
Patternmaking	\square		1	Ι		/																	Ι	Π		T	
Electricity							+														Π		Ι			Τ	
Carpentry																					\prod			Π		Τ	
Ceramics							ł	ľ															Ι			Γ	
Benchmetal							$\left \right $														Π	Τ	Γ	Π		T	
Plumbing						4		ľ													Π	Τ	Γ	Π	Τ	Τ	
Artmetal					$\left[\right]$								ĺ								Π		Γ	Π	Τ		
Sheetmetal							$\left[\right]$	\mathbf{k}															T	Π	Τ	Τ	
Plastics										N											Π	Τ	Γ	Π	Τ	Γ	
Textiles (not correlated)							ł	Ē	\langle												Π		Ι	Π	T	Τ	
Foundry			- \		1			Y											T		Π	Τ	Γ	Π	Τ	Τ	
Welding							V									Ι		Π	T		Π	T	T	Π		Τ	
Metal Forging							$\left[\right]$									Ι			Ι			Ι	Γ	\prod	Ι	Γ	
Leather Work						Y	1											\prod	Ι		Π	Ι	Γ	Π	Ι		
(Teacher credit hours of preparation in terms of) fo so	o i er	5 m		11 510	eı	1	0 h	01	ır	1 's	5			20)		2	25	;		3	0			3	4

Time spent teaching areas in terms of hours per semester ------

Coefficient of correlation was found to have been +0.65.

The areas of woodworking (cabinet work), machine shop, six. benchmetal, artmetal, sheetmetal, metal forging, welding, electricity, and drafting were evidently the areas most commonly taught in one-man general shops. Pearson's formula was used again to determine the coefficient of correlation between these areas and the preparation of the general shop teachers in those areas. The product-moment coefficient was found to be +0.85. Guilford⁵ roughly describes such a coefficient as showing a high degree of correlation and a marked relationship (see Figure 2). Therefore, in most cases the program which the general shop teacher offered in his shop had a marked relationship to the extensiveness and emphasis of his preparation. However, the industrial experience of many teachers may have affected the program also.

Effect of Industrial Experience on General Shop Programs

From the data compiled and tabulated in Table III, the relative effect of the general shop teacher's industrial experience seemed to have had no real effect upon the shop programs.

⁵ <u>Loc. cit.</u>

FIGURE 2

THE RELATIVE EMPHASIS OF THE AREAS MOST COMMON IN GENERAL SHOPS COMPARED WITH THE PREPARATION OF SHOP TEACHERS IN THOSE AREAS

Areas Most Common in General Shops

			_				_			-			_	_		-	_		 _	-			_	_		-	-
Woodworking																											
Drafting							ľ											-	 - -	$\left \right $	+	 +			ſ	$\left[\right]$	
Machine Shop Work					ł	1					ł	ł	$\frac{1}{2}$	1	1												
Electricity				/																							\prod
Benchmetal			[\prod
Artmetal									Į	1	Ί																
Sheetmetal									Ν																		
Welding										X	Ί																
Metal Forging								Į																			
	0)			5				1	0			1	5			2	0		2	5		3	0			35

Teachers credit hours of formal preparation in terms of semester hours ------

Time spent teaching areas in terms of hours per semester _____

Computed correlation = +0.85

TABLE III

COMPARATIVE TABULATIONS OF GENERAL SHOP TEACHERS' INDUSTRIAL EXPERIENCE

Areas and Relative Numbers of	f	Number of	Per Cent of	Men ir Ar W Fc	Teach- ng in eas With ormal	Men T ing Are With For	leach- ; in eas nout rmal	Men ir Ar Wit Fo	Teach- ng in ceas chout ormal	Meo	lian Mc nose Me	nths n Tea	of Exp aching	erier in Ar	ice of reas	Rough Descriptions of Effects
Men Teachin	ng	With	With	Pre	para-	Prep tion.	Only	Pre	epara-	-	1-4	E.	5-12	12-	over	Experience Had Upon
General Shop	os	Experience in Areas	Experience in Areas*	Expe	rience	Exper	ience	Exper	rience ⁺	No.	Med.	No.	Med.	No.	Med.	Correlations
01 112 SCN00	DIS			Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent*							ondertaken
Woodworking	112	61	54.5	61	100.0	0	0	0	0	6	3	29	11	26	37	added emphasis
Pattern- making	10	8	7.2	3	37.5	1	33.3	1	3.45	1	3		-	2	66	some
Carpentry	29	64	57.1	17	27.6	7	9.1			2	2	8	11.3	14	33	some
Machine	33	30	27.8	11	36.8	0	0	1	3.33	2	3	5	9	4	20	substantial
Benchmetal	66	18	16.0	10	55.4	2	11.1	4	6.1	3	4	10	5.5	5	40	some
Artmetal	35	1	.9	0	0	0	0	5	7.7	-			745		6557	none
Sheetmetal	68	21	18.7	14	66.7	1	4.8	11	16.2	3	3	5	9.5	7	38	some
Metal	33	6	5.3	3	50.0	0	0	8	24.0		-	2	10	1	40	little
Welding	33	26	23.1	10	26	1	3.8	8	24.0	3	2	3	11	5	28	none
Foundry	6	7	6.3	0	0	0	0	0	0	-		-		201	885	none
Plumbing	30	28	25.0	6	21.2	9	32.0	6	20.0	6	1.5	5	8	1	30	substantial
Auto	14	27	24.0	6	45.0	0	0	6	42.8	2	1.5	3	9	l	24	some
Electricity	65	34	30.2	15	44.1	5	14.7	9	13.8	8	2	8	9	4	33	some
Printing	7	7	6.3	1	14.3	0	0	2	28.6	1	4	-				none
Textiles	0	0	0	0	0	0	0	0	0	-				-	-	
Design	8	5	4.5	2	40	0	0	3	37.5	-	-	-		2	3.0	none
Drafting	79	20	17.8	16	80	1	5	4	5.1	2	2	10	10	4	4.5	none
Leather work	16	6	5.3	3	50	1	10.1	0	31.4	1	4	2	0	-	18	little
Ceramics	2	3	2.7	1	33.3	0	105	0	211 6	-	-		- 0 E		10	TICCTE
Plastics	26	8	7.2	4	50	1	15.2	9	34.0	1	4	3	2.2	1	24	none

* Based upon 112 surveyed.

+ 42 men were in this classification.

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The teachers who were teaching in areas where they had no preparation or industrial experience probably affected the correlations computed more so, because the areas which were taught in those situations were those that received the most emphasis in the general shop program. This tended to raise the medians of time spent teaching without raising the medians in the areas of preparation. Therefore, the curves representing the time spent teaching the various areas (see Figures 1 and 2) were augmented without affecting the curves representing the credit hours of preparation.

Future Program Changes

Item eighteen of the major questionnaire dealt with anticipated changes in the general shop program. It was included in the questionnaire for two purposes: (1) to discover the future plans for general shop programs; and (2) to relieve possible frustrations of those teachers who realized the inadequacy of their programs, by offering a means of indicating their plans for the future. Significant data were not obtained because so few indicated any planned changes of program. Those few indicated a tendency toward less time spent in woodworking and more time spent in the area of machine shop work. Other responses were too scattered to determine any tendencies.

CHAPTER V

THE INTERVIEWS

Introduction

In all there were 52 schools visited, twenty-three of which were schools whose principals had not returned the postcard questionnaire. The purpose of interviewing these principals was to establish some basis for estimating the number and types of industrial arts programs unavoidably left out of the survey. Twenty-two schools were visited in order to interview the general shop teachers who had returned the major questionnaire. The purpose of those interviews was to determine the validity of the questionnaire received. There were fifteen schools visited whose general shop teachers had not returned their copies of the major questionnaire. The purpose of visiting and interviewing those teachers was to determine the reason for their delay in returning the questionnaires and to evaluate their shop programs in anticipation of receiving the questionnaires later. It was justified, for 80 per cent of them were returned after the interview. Schools were classified according to the limitations of each classification in Table I.

Results of Interviews With Principals Who Had Not Responded

The seventeen principals who were interviewed stated various reasons for not responding. The most popular reason was that they did not remember receiving the guestionnaire. One principal said that he did not remember receiving the questionnaire, but did remember that he had received the follow-up card. In only one case did a principal say that he forgot to return the questionnaire. There were seven schools which had one-man general shop departments. In order to expedite the investigation of the programs of Detroit schools whose principals had not returned the post-card questionnaire, the Director of Industrial Education, Earl L. Bedell, was in-The interview disclosed that all the junior high terviewed. school level schools had industrial arts departments with more Therefore, the eight schools whose printhan one teacher. cipals had not returned the post-card questionnaire in the Detroit area had programs which could not be used in the survey. Based on information compiled from interviews, an estimated forty-two schools had one-man general shop departments but had not returned the questionnaire. Totaled with 260 known cases, an estimated 302 one-man general shop departments existed at the junior high school level in Michigan.

Results of Interviews With Teachers Who Had Not Responded

Of the fifteen teachers interviewed who had not returned the major questionnaire, six claimed that they had answered all the items except those which dealt with credit hours of preparation and hours spent teaching areas listed. They found it difficult to remember the credit hours of preparation they had had and also found it difficult to determine the time spent teaching areas covered in their shop classes. If the word "relative" had been used in the item more teachers might have understood the item more clearly. Three teachers interviewed said that they had thrown the questionnaire away, but accepted another when it was offered. There were three teachers who claimed that they had never received the questionnaire, but accepted a copy at the time of the interview. The last three teachers had not returned the questionnaire

because in two cases the teachers were members of two- and three-man departments and realized the questionnaire did not apply to them. The last case was where the teacher was not holding classes until the following fall semester.

In each of the fifteen schools where general shop teachers were interviewed, the shop program was evaluated with the use of a scoring card. In the cases where the teachers returned the questionnaire, a comparison was made between the responses on the questionnaire and the information noted on the scoring card. In all cases the information tabulated on the scoring card compared favorably with the responses received on the questionnaire. The score card dealt with: (1) the relative amounts of the various equipment and facilities available (2) the projects that the students produced in the various areas of study; and (3) the relative time spent in each area as stated by the teacher.

Results of Interviews to Determine the Validity of the Returned Questionnaires

Interviews with the teachers who had returned the major questionnaire involved the use of a score-card. The same score-card was employed in these interviews as was used in

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the interviews with the teachers who had not returned the questionnaires. The tabulated information on the score-cards coincided with reasonable accuracy in all cases but one. The teacher in that one case indicated time spent in areas touched minutely in producing projects in other areas. The time indicated as being spent was very small and would not have affected the computed correlation significantly. The interviews indicated that the teachers in all classifications responded as accurately as was possible.

CHAPTER VI

CONCLUSIONS, SUMMARY, IMPLICATIONS AND AREAS FOR FURTHER STUDY

Introduction

The first chapter of this study set forth three basic objectives: (1) to discover the status of the one-man junior high school level industrial arts general shop department; (2) to reveal the status of the junior high school level industrial arts general shop program; and (3) to find the relationship, if any, between the teachers' preparation and the programs offered in junior high school level general shops.

Summary and Conclusions

There were 611 junior high school level schools which were within the limits of the survey. A post-card questionnaire was sent to the principal of each school, and 470 of the principals returned answered questionnaires. These returned questionnaires revealed that there were at least 270 one-man general shop departments at the junior high school level in Michigan. Sixty-eight per cent of those teachers answered questionnaires about their status and they reported their status as generalized in the following:

1. Seventy-eight per cent majored in industrial arts while in college and 9 per cent minored in industrial arts.

2. Seventy-six per cent held Bachelor of Science or Arts degrees while 9.5 per cent held Master of Science or Arts degrees, and 3.9 per cent held no degree.

3. Twenty-one and six-tenths per cent had the minimum of 120 semester hours or 200 quarter hours of credit, while 3.4 per cent had less than the minimum 120 semester or 200 quarter hours of credit, but 75 per cent had postgraduate credit.

4. Those having postgraduate credit were found to have a median of 14.8 semester hours of credit.

5. Fifty-nine per cent taught subjects other than industrial arts, and those who did teach other subjects taught a median number of two.

6. Of those who taught other subjects, 48 per cent were teaching either social science, mathematics, or science, which followed the trend in the frequency of having "minors" in those areas. 7. Fifty-one per cent of the general shops had classes organized in either of the two types; the first was described as having classes which had several areas of industrial arts being pursued simultaneously wherein the individual pupil moved from area to area as he completed the work. The second type of organization employed was described as having classes in which each pupil worked on a different project and each project involved several areas of industrial arts.

8. Twenty-four per cent had programs which included girls, of which a very small percentage offered shop classwork that differed from that offered boys.

9. Seventy-two per cent were in schools which required industrial arts for boys, and the tendency was for the require-

10. Shop programs reflected the teachers' preparation to a marked degree, while the shop teachers' industrial experience had little effect upon the general shop programs.

Interviews, which were undertaken to substantiate the validity of the questionnaires used, disclosed that teachers who returned the questionnaires had evaluated their programs with a reasonable degree of accuracy. Interviews with 23 principals who had not returned the post-card questionnaire disclosed that approximately 30 per cent, or 42 of the total 141, had one-man general shop departments. On that established basis, an <u>esti-</u> <u>mated</u> 302 one-man general shop departments existed at the junior high school level in Michigan.

Implications

Of the major questionnaires which could not be used, 30 per cent were from teachers whose programs were of the unit shop type. This meant that 12.3 per cent of the principals who had returned the post-card questionnaires had not correctly indicated that their one-man industrial arts departments were of a general shop nature. The implication is that 12.3 per cent of them did not really know what a general shop was or they did not know what type of shop was in their schools.

There was one known case, revealed by interview, where the shop teacher had not returned the questionnaire because he did not have a general shop program. There again, was a case where the principal had not indicated the correct type of situation. The implication is that there may have been similar circumstances where the teacher had not returned the questionnaire because he realized it did not apply to his type of situation. A further implication is that there were more than 12.3 per cent of the principals who did not know what a general shop was or did not know what type of shop was in their schools.

There was one known case where a general shop teacher had not returned the major questionnaire because he may not have wished to disclose the fact that he did not have a degree or have any preparation in industrial arts. He was also the principal of the school. The implication is that there may have been teachers who did not return the major questionnaire because it would reveal their below-minimum standards of educational attainment required of teachers for certification.

There were 42 cases in which teachers taught areas for which they had no preparation or experience. An implication, which may satisfy questions raised, could be that the pressure of pupil interest and/or administrative pressure had forced those teachers to teach those areas in which they had no preparation or experience. A further implication is that perhaps, if the courses covering those areas had been available to the teachers as undergraduates, they might have obtained preparation in those areas.

Areas For Further Study

1. A study of the total number of teachers engaged in teaching industrial arts in Michigan, compared with the total number engaged in general shop programs at the junior high school level in the state would be of value to educators for determining the emphasis to be placed in industrial arts preparatory programs in terms of the relative possibility of placement.

2. A survey designed to reveal the relative time spent teaching industrial arts, or specifically general shop, compared to the time spent teaching other subjects and the time spent in teaching each of the subjects, would be of value to educators.

3. A study of the various types of general shop programs in use in the state would be of value in industrial arts education.

4. A study of the effectiveness of industrial arts general shop programs would be of great value to the field.

5. A study of physical facilities which could be recommended for various types of school and community situations would be of value to teachers who plan to change their general shop program.

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APPENDIX

Section

1. The Post-card Questionnaire

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- 2. The Follow-up Card for Post-card Questionnaire
- 3. The Major Survey Questionnaire
- 4. The Letter of Introduction for Major Survey Questionnaire
- 5. The Follow-up Card for Major Survey Questionnaire

2 52 Do you have any Industrial Arts general shop classes at Indicate the number of Industrial Arts teachers conduct-Indicate the number of teachers in your Industrial Arts If there is just one Industrial Arts teacher working with pupils at that level, please write his name in the blank Thank you for your consideration and time. THIS SIDE OF CARD IS FOR ADDRESS the (7-8-9) grade levels. How many?..... department at the (7-8-9) grade levels. ing the general shop classes. Mr. provided below. The Post-card Questionnaire -----Yes No relun W. Homieke the Junior High School level. The results of this survey will aid in over and check the items on the reverse side, it will be greatly Attached is a questionnaire which is part of a survey attemptin the state of Michigan. It is a survey directed, primarily, toward mproving Industrial Arts teacher preparation. Now turn the card ing to discover the trends in Industrial Arts general shop classes c/o J. A. Fuzak John M. Shemick Section 1. THIS SIDE OF CARD IS FOR ADDRESS Sincerely, REPLY CARO 00 Michigan East Lansing, Michigan State College **Division of Education** JOHN M. SHEMICK appreciated. Dear

The Follow-up Card for Post-card Questionnaire



The questionnaire has had a high rate of return. Will you take just a moment to check the items on the card and drop it in the mail today? Please help make this a completely successful survey. It will be greatly appreciated.

Sincerely,

in Mr. Shemick

John M. Shemick

The Major Survey Questionnaire

	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	
On Industri	ial Arts General Shop	leacher Preparation
"Gitt wonth TOO OD +	····	
Carpentry		Electricity
Machine Shop		Printing
Benchmetal		Textiles
Artmetal		Design
Sheetmetal		Drafting
Metal Forging		Leather work
Welding		Cerami cs
Foundry		Plastics

- 17. In the column "Now" indicate the approximate number of hours you now teach the listed areas in your general shop.
 - In the column "Fut" indicate the number of hours you expect or may be planning to teach in your general shop, in the future. 18.
- In the column "Exp" indicate the number of months of work experience you have had in the listed areas. (If any) 19.

Yes ... No 20. Do you wish a copy of the results of this questionnaire?

The Letter of Introduction for Major Survey Questionnaire May 10, 1951

Dear Mr. Smith,

I am making a survey of Industrial Arts general shop classes at the (7-8-9) grade levels in Michigan. This survey is being directed toward those schools having just one Industrial Arts teacher. I have selected this particular situation because it occurs so frequently.

The over-all objective of this survey is to aid in improving Industrial Arts teacher preparation for general shop situations. The specific aims are to study (1) the preparation that the general shop teachers have had in the various areas of Industrial Arts; (2) the areas offered the students in general shop classes; (3) the organization employed by the shop teacher in instructing the general shop class.

Your participation in this survey is vital for there is no information available or compiled about general shops in Michigan. The results of the questionnaire will be confidential and tabulated to discover trends of general shops in Michigan. Will you help me make a genuine and concrete contribution to Industrial Arts? It is you, and you alone, who can produce the information I seek.

Tabulation of the results of the questionnaire will begin on May 21st. If you <u>could</u> return the answered questionnaire <u>before</u> that date, it will be greatly appreciated.

Thank you for the time and consideration that you have given this letter and questionnaire.

Sincerely, alu M. Shemick

John M. Shemick

The Follow-up Card for Major Survey Questionnaire

Michigan State College May 28, 1951 A questionnaire, dealing with Industrial Arts general shops, has been sent to you. Perhaps you have set it aside or over-looked it while sorting your mail. The returns on the questionnaire have been high. Will you take just a moment and check through the items and send it in today? Please help make this a completely successful survey. It will be greatly appreciated. Sincerely, lun M. Shemick John M. Shemick

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