

A STUDY OF THE GENERAL SHOP COURSE AS TAUGHT IN THE
INDUSTRIAL ARTS DEPARTMENT OF THE JUNIOR HIGH SCHOOL

by

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PURPOSE OF THE STUDY

The general shop movement has progressed so rapidly within the last few years that it demands the attention and consideration of all those interested in industrial arts and vocational education.

It is the purpose of this study, therefore, to ascertain the manner in which the general shop course is being conducted in the junior high schools in the various states, including the subjects taught, the length of daily periods, in which grades taught, the number of weeks given to each subject, the outstanding methods of instruction and teaching procedures, the manipulative shop practices, and the types of shop used.

INTRODUCTION

The industrial education has in the past been defined as that form of vocational education which is designed to teach some industrial occupation or trade. It covers both the industrial arts and the vocational type of education or training in the industrial field. The industrial arts education includes instruction in the various shop activities, based upon practices with and knowledge of tools, materials, and processes of industry.

The industrial arts movement in the United States began with the Russian system of tool instruction, which was mainly on an exercise basis. Our industrial arts work, even at its very beginning, was somewhat modified by the Swedish sloyd systems (28). In their native lands both systems were essentially vocational; in the United States they became, and still are, pedagogical rather than vocational in nature. From the very start, two types of systems gradually developed: the general shop idea, in which students get experience in different shop activities, without acquiring a high degree of skill in any one line; and the single-shop idea, where the student gets sufficient experiences on a full equipment of tools, machines and materials to prepare him to enter industry in a specific occupation upon the completion of his course.

The general shop is a type of industrial arts set-up which includes work with a number of different kinds of materials and occupational activities. The majority of general shop courses are organized on the plan of a single comprehensive shop to include work in all the activities offered in the course, rather than on the basis of a cycle of shops through which the students are routed as a group for a limited period of work in each activity (10). The comprehensive shop plan makes it possible for a pupil to

work continuously on a project involving more than one activity until it is completed.

Variations of general shop organization (29, p. 12-14) are as follows:

The single comprehensive shop (composite shop) containing several types of plans.

- (a) Group of students work at each type of equipment simultaneously and rotate through them.
- (b) Students work at only one type of equipment which is brought to the foreground. Types of work alternated.

The modified general shop (sometimes called the shop-cycle type) a plan whereby the students are rotated through a series of related unit shops.

The portable general shop - a plan for transporting the teacher and equipment to a number of cooperating schools which share the expense.

It is well also to recognize that the general shop is with us because certain objectives of the industrial arts have been set up, which in turn have led to the development of certain courses of study which can be taught to good advantage in a general shop. These objectives (7), which follow, have been generally accepted:

1. Ability to perform unspecialized activities about

the house, basement, garage, yard, garden, motor car, etc.

2. Ability as a consumer to judge the qualities and values of the products of specialized occupations.

3. Ability, disposition, and habit of observation and reading of things in the world of productive industry as enjoyable and fruitful leisure occupations.

4. A proportional intellectual apprehension of the world of productive industry; of the specialized occupational groups which compose it; and of tools, machines, raw materials, processes, products, etc., involved. Ability to think in terms of realities.

5. Ability to choose one's vocation.

6. A disposition and habit of being up and doing, independent, active, and positive in one's home life and one's affairs in general; not dependent upon others, passive and negative.

7. A disposition and habit of holding one's practical labors to reasonably high standards of performance; of always doing one's best. Dislike of things careless, faulty, incomplete, etc.

8. Ability to appreciate the training and skill required of the craftsman or mechanic and the value of his contributions of service to society.

9. Ability to appreciate the value of organization,

management, and quantity production in the industries.

10. Ability to offer better judgment and sympathetic understanding of the problems of both labor and capital, and a realization of the necessity for greater cooperation between those two indispensable public agencies.

In collaboration with the industrial arts set-up, certain specific objectives (32) have been formulated for the general shop course:

1. To set up ideals of good workmanship; the disposition to do one's best.
2. To promote creative self-expression.
3. To develop attitudes of responsibility, cooperation, thoroughness, accuracy, perseverance, and neatness.
4. To develop mental coordination in the use of common tools and materials.
5. To develop initiative in creative thinking.
6. To awaken avocational and vocational interests.
7. To develop an appreciation of harmonious relations in form, color, and details of design.
8. To develop an understanding of the practical applications of mathematics and science to various common products of the industries.
9. To develop an appreciation of our debt to industrial workers.

TECHNIQUE USED IN THE STUDY

Source of Information

In order to secure first-hand information in regard to the general shop course as it is being conducted in the various schools throughout the United States, the questionnaire method was used.

Questionnaires were sent to ninety-eight schools in the following states: Massachusetts, New York, Oklahoma, Illinois, Nebraska, Colorado, Pennsylvania, Missouri, California, and Kansas. Forty-four replies were received.

In addition to the information obtained from the questionnaire, all material available, including books, magazine articles, and special reports were studied, in order to obtain the view points of others upon the problems pertaining to the general shop course, and in making comparisons with the data obtained from the questionnaire.

THE QUESTIONNAIRE

The following is a duplicate of the portion of the questionnaire from which the findings were taken:

*Units in the General Shop Courses of the Junior High School Including the 7th, 8th, and 9th Grades	Length of daily periods in minutes	Units taught in what grade 7th, 8th or 9th.	Number of weeks given to each unit.	Method of Instruction			Teaching procedure				Manipulative shop procedure		Where taught		
				Rate 1-2-3	Class	Lecture	Demonstration	Illustration	Trips to industry	Exercises	Practicum	Projects	Special Shop	Composite Shop	
Woodworking				Individual											
Mechanical Drawing															
Sheet Metal															
Electricity															
Printing															
Concrete and Cement															
General Metal															
Auto Mechanics															
Machine Shop															
Wood Pattern Making															
Foundry															

* Please indicate units taught and grades where offered, checking on procedures as called for.

Figure 1

THE ANALYSIS OF DATA OBTAINED

As a basis for study, the data was arranged under each of the ten subjects covered, as follows:

The length of daily periods.

In what grade taught (7th, 8th or 9th).

The number of weeks given to each subject.

The methods of instruction.

1. Individual
2. Group
3. Class

The teaching procedure.

1. Lecture
2. Demonstration
3. Illustration
4. Trips

Manipulative shop procedures.

1. Exercise
2. Practicum
3. Project

Where taught.

1. Special shop
2. Composite shop

THE SUMMARIZATION OF RESULTS

Part 1. Woodworking

In this survey woodworking was found to be the subject most commonly taught in the general shop course. The length of daily periods varied from forty-five to ninety minutes. Forty-two and one-half per cent of the schools used sixty minute periods, twenty per cent used fifty-five minute periods, fifteen per cent used fifty minute periods, and ten per cent used forty-five minute periods.

Figure 2 illustrates the comparative length of daily periods used by the various schools.

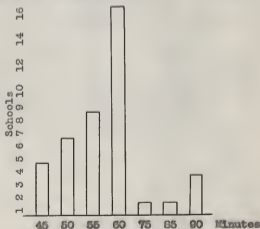


Fig. 2. Graph showing length of daily periods.

Eighty-nine per cent of the schools offered woodworking in their general shop course to the seventh, eighth or ninth grades.

19%	offered woodworking	to all three grades
17%	"	to the 7th and 8th grades
25%	"	to the 7th and 9th grades
14%	"	to the 8th and 9th grades
8%	"	to the 7th grade only
3%	"	to the 8th grade only
14%	"	to the 9th grade only

The time given to this subject varied from six to forty weeks. It was offered for a period of eighteen weeks by thirty per cent of the schools, for a period of thirty-six weeks by twenty-two and one-half per cent, and for a period of twenty weeks by fifteen per cent.

Figure 3 illustrates the comparative number of weeks given to woodworking in the various schools.

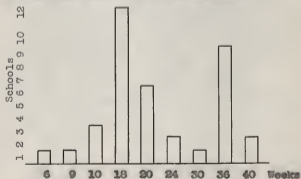


Fig. 3. Graph showing number of weeks given to woodworking.

The methods of instruction were given the following rating: individual instruction, first; group instruction, second; and class instruction, third. Special emphasis was placed on individual instruction for the woodworking classes, due, no doubt, to the particular nature of the subject and to the individual differences which exist among the students.

The following illustrates the rating of the methods of instruction as given by the various schools:

47%	rated	individual	instruction	first		
34%	"	class	"	"	"	"
19%	"	group	"	"	"	"
55%	rated	group	instruction	second		
26%	"	individual	"	"	"	"
19%	"	class	"	"	"	"
49%	rated	class	instruction	third		
27%	"	individual	"	"	"	"
24%	"	group	"	"	"	"

The teaching procedures used in the teaching of woodworking were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth. The nature of the subject seems to lend itself most effectively to the demonstration and illustration procedures, because of the skill that should be mastered in the use of tools.

The teaching procedures were rated as follows by the various schools:

85%	rated	demonstration	procedure	first
7%	"	illustration	"	"
7%	"	lecture	"	"
69%	rated	illustration	procedure	second
32%	"	lecture	"	"
9%	"	demonstration	"	"
39%	rated	lecture	procedure	third
35%	"	illustration	"	"
26%	"	trips	"	"
71%	rated	trips	procedure	fourth
29%	"	lecture	"	"

Of the three manipulative shop procedures eighty-five per cent of the schools were using projects, ten per cent were using exercises, and five per cent were using practicums. This finding of the survey shows that the wood-working project is by far the outstanding manipulative shop procedure, as illustrated in Figure 4.

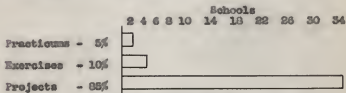


Fig. 4. Graph showing the manipulative shop procedures.

The general shop course has been organized for two types of shops: the special shop, where the students rotate through a series of related shops; and the composite

shop, which is a single large room or shop in which the equipment is organized so that the entire class goes through a number of different divisions in a given order (20, p. 12). This finding of the survey shows that seventy-five per cent of the schools were using the special shop for the teaching of woodworking and twenty-two per cent were using the composite shop.

The special shop is ordinarily used by the larger schools, where there are from four to six related shops through which the students may rotate, remaining from six to nine weeks in each division. Since this survey covered the larger schools only, this finding, consequently, shows a larger number of schools using the special shop.

Part 2

Mechanical Drawing

It was found that mechanical drawing followed wood-working closely in the choice of subjects being taught in the general shop course, with eighty-five per cent of the schools offering it to the seventh, eighth, or ninth grades.

11%	offered mechanical drawing	to all three grades
6%	"	"
11%	"	"
14%	"	"
11%	"	"
3%	"	"
44%	"	"
		to the 7th and 8th grades
		to the 7th and 9th grades
		to the 8th and 9th grades
		to the 7th grade only
		to the 8th grade only
		to the 9th grade only

It is to be particularly noted that forty-four per cent of the schools offered this subject to the ninth grade only.

The time given to mechanical drawing varied from six to forty weeks. It was offered by thirty-five per cent of the schools for a period of eighteen weeks, by fifteen per cent for a period of twenty weeks, by twelve per cent for a period of thirty-six weeks, and by twelve per cent for a period of ten weeks.

Figure 5 illustrates the comparative number of weeks given to mechanical drawing by the various schools.

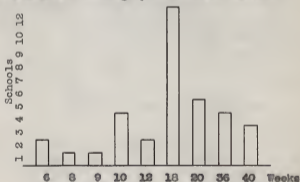


Fig. 5. Graph showing number of weeks given to mechanical drawing.

The length of daily periods varied from forty-five to ninety minutes. Thirty-nine per cent of the schools used sixty minute periods, twenty-one per cent used fifty-five

minute periods, and eighteen per cent used fifty minute periods. The fifty, fifty-five and sixty minute periods were used by the majority of the schools.

Figure 6 illustrates the comparative length of daily periods used in the teaching of mechanical drawing by the various schools.

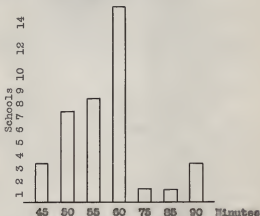


Fig. 6. Graph showing length of daily periods.

The methods of instruction were given the following rating: individual instruction, first; group instruction, second; and class instruction, third. This finding of the survey placed special emphasis on individual instruction for the mechanical drawing classes, probably due to the individual differences in ability which exist among

the students. The rating of the methods of instruction were given as follows by the various schools:

43%	rated individual instruction first		
30%	" class	"	"
18%	" group	"	"
50%	rated group instruction second		
32%	" individual	"	"
18%	" class	"	"
44%	rated class instruction third		
28%	" individual	"	"
28%	" group	"	"

In comparing the methods of instruction used in the teaching of mechanical drawing with those used in wood-working, the final rating is the same with a slight variation in per cent.

The teaching procedures were given the following rating: demonstration, first; lecture, second; illustration, third; and trips, fourth. This finding of the survey shows that the demonstration is the outstanding teaching procedure for mechanical drawing, with lecture rated second, only slightly higher than illustration.

The teaching procedures used in the teaching of mechanical drawing were rated as follows by the various schools:

57%	rated demonstration procedure first		
23%	" illustration	"	"
20%	" lecture	"	"
42%	rated demonstration procedure second		
31%	" lecture	"	"
27%	" illustration	"	"

48%	rated illustration procedure	third
41%	" lecture	" "
11%	" trips	" "
89%	rated trips procedure	fourth
11%	" lecture	" "

Of the three manipulative shop procedures fifty-five per cent of the schools used projects, thirty-seven per cent used exercises, and eight per cent used practicums. This finding of the survey shows that the project was the outstanding manipulative procedure used, doubtless due to the fact that forty-four per cent of the schools offered mechanical drawing only to ninth grade students.

Figure 7 illustrates the comparison of the three manipulative shop procedures used in the teaching of mechanical drawing.

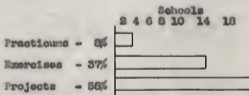


Fig. 7. Graph showing the manipulative shop procedures.

This finding of the survey shows that thirty-five per cent of the schools were using the composite shop for the teaching of mechanical drawing, while sixty-five per cent

were using the special shop or drawing-room. This is due in part to the nature of the course, since the disturbances caused by the other shop activities in a composite shop is a direct hindrance to a successful drawing class.

Part 3

Sheet Metal

Sixty-seven per cent of the schools covered in this survey offered sheet metal in their general shop course to the seventh, eighth, or ninth grades.

The following is a distribution by per cent of the various schools offering sheet metal to any or all of the three grades.

5%	offered sheet metal to all three grades
19%	" " " to the 7th and 8th grades
10%	" " " to the 7th and 9th grades
13%	" " " to the 8th and 9th grades
10%	" " " to the 7th grade only
33%	" " " to the 8th grade only
10%	" " " to the 9th grade only

The number of weeks given to sheet metal varied from two to forty weeks. The majority of the schools offered sheet metal either for nine weeks or for twenty weeks.

Figure 3 on the following page illustrates the comparative number of weeks given to sheet metal by the various schools.

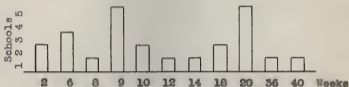


Fig. 8. Graph showing number of weeks given to sheet metal.

The length of daily periods varied from forty to ninety minutes. Thirty-two per cent of the schools used sixty minute periods, thirty-two per cent used fifty-five minute periods, and sixteen per cent used fifty minute periods. The fifty, fifty-five, and sixty minute periods were used by eighty per cent of the schools offering sheet metal.

Figure 9 illustrates the comparative length of daily periods used by the various schools.

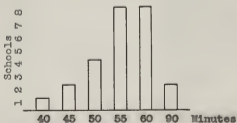


Fig. 9. Graph showing length of daily periods.

The methods of instruction were rated as follows: individual instruction, first; group instruction, second; and class instruction, third. This same rating was given to both woodworking and mechanical drawing, as has been previously shown.

The various schools rated the methods of instruction in sheet metal as follows:

39%	rated	individual	instruction	first
31%	"	group	"	"
30%	"	class	"	"
45%	rated	group	instruction	second
35%	"	individual	"	"
20%	"	class	"	"
47%	rated	class	instruction	third
29%	"	individual	"	"
24%	"	group	"	"

The teaching procedures used were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth.

The various schools rated the teaching procedures for sheet metal as follows:

68%	rated	demonstration	procedure	first
8%	"	lecture	"	"
4%	"	illustration	"	"
63%	rated	illustration	procedure	second
21%	"	lecture	"	"
12%	"	demonstration	"	"
4%	"	trips	"	"

52% rated lecture procedure third
 37% " illustration " "
 11% " trips " "
 78% rated trips procedure fourth
 22% " lecture " "

Eighty-four per cent of the schools used projects and sixteen per cent used exercises as their manipulative shop procedure. This finding of the survey shows that the small sheet metal project is practical as a manipulative shop procedure for the junior high school, as shown in Figure 10.

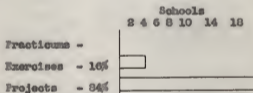


Fig. 10. Graph showing the manipulative shop procedures.

Forty-six per cent of the schools in which sheet metal was being taught, used the composite shop; and forty-four per cent used the special sheet metal shop. This finding of the survey shows that sheet metal is better adapted to the composite shop than either woodworking or mechanical drawing, since the majority of the schools used special shops for woodworking and mechanical drawing.

Part 4
Electricity

In this survey fifty-five per cent of the schools offered electricity in their general shop course to the seventh, eighth, or ninth grades.

5%	offered electricity	to all three grades
9%	"	" to the 7th and 8th grades
14%	"	" to the 7th and 9th grades
19%	"	" to the 8th and 9th grades
14%	"	" to the 7th grade only
25%	"	" to the 8th grade only
14%	"	" to the 9th grade only

The number of weeks given to electricity varied from two to forty weeks. Twenty-six per cent of the schools offered this subject for a period of twenty weeks, thirteen per cent offered it for a period of nine weeks, and thirteen per cent offered it for ten weeks.

Figure 11 illustrates the comparative number of weeks given to electricity by the various schools.

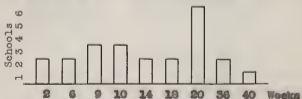


Fig. 11. Graph showing number of weeks given to electricity.

The length of daily periods varied from forty-five to ninety minutes. Twenty-nine per cent of the schools used fifty-five minute periods, twenty-five per cent used fifty minute periods, and twenty-five per cent used sixty-minute periods. Therefore, the fifty, fifty-five, or sixty minute periods were used by seventy-nine per cent of the schools.

Figure 12 illustrates the comparative length of daily periods used by the various schools.

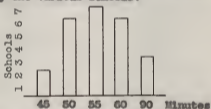


Fig. 12. Graph showing length of daily periods.

The methods of instruction used in the teaching of electricity were given the following rating: individual instruction, first; group instruction, second; and class instruction, third.

The rating of the methods of instruction for electricity was given as follows by the various schools:

48%	rated individual instruction first
29%	" group " "
23%	" class " "

69%	rated	group	instruction	second
21%	"	individual	"	"
11%	"	class	"	"
57%	rated	class	instruction	third
37%	"	individual	"	"
6%	"	group	"	"

The teaching procedures used in the teaching of electricity were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth.

The various schools rated the teaching procedures for electricity as follows:

76%	rated	demonstration	procedure	first
19%	"	lecture	"	"
5%	"	illustration	"	"
46%	rated	illustration	procedure	second
27%	"	lecture	"	"
27%	"	demonstration	"	"
50%	rated	illustration	procedure	third
27%	"	lecture	"	"
23%	"	trips	"	"
77%	rated	trips	procedure	fourth
23%	"	lecture	"	"

Of the three manipulative shop procedures, fifty-five per cent of the schools were using projects, thirty-seven per cent were using exercises, and eight per cent were using practicums. Again the project was the outstanding shop procedure, as shown in Fig. 13 on the following page.

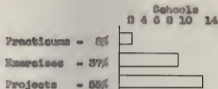


Fig. 13. Graph showing the manipulative shop procedures.

In checking the types of shop used, it was found that fifty-three per cent of the schools were using the composite shop for electricity, while forty-seven per cent were using the special shop.

Part 5

Printing

Forty-one per cent of the schools covered in this survey offered printing in the junior high school, which included the seventh, eighth, and ninth grades.

14%	offered printing	to all three grades
7%	"	" to the 7th and 8th grades
30%	"	" to the 8th and 9th grades
7%	"	" to the 7th grade only
36%	"	" to the 9th grade only

The number of weeks given to this subject varied from two to forty weeks, thirty-four per cent of the schools offering it for a period of twenty weeks; seventeen

per cent for a period of eighteen weeks, and seventeen per cent for a period of thirty-six weeks.

Figure 14 illustrates the comparative number of weeks given to printing by the various schools.

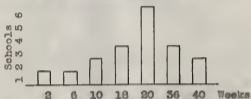


Fig. 14. Graph showing number of weeks given to printing.

The length of daily periods varied from forty-five to ninety minutes. Thirty-nine per cent of the schools used sixty minute periods, while thirty-three per cent used fifty-five minute periods.

Figure 15 illustrates the comparative length of daily periods used by the various schools.

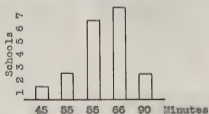


Fig. 15. Graph showing length of daily periods.

The methods of instruction used in the teaching of printing were given the following rating: individual instruction, first; group instruction, second; and class instruction, third.

The rating of the methods of instruction for printing was given as follows by the various schools:

38%	rated	individual	instruction	first
31%	"	group	"	"
31%	"	class	"	"
45%	rated	group	instruction	second
33%	"	individual	"	"
22%	"	class	"	"
57%	rated	class	instruction	third
29%	"	individual	"	"
15%	"	group	"	"

The teaching procedures were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth. These teaching procedures for printing were rated as follows by the various schools:

67%	rated	demonstration	procedure	first
25%	"	lecture	"	"
8%	"	trips	"	"
48%	rated	illustration	procedure	second
27%	"	lecture	"	"
27%	"	demonstration	"	"
33%	rated	lecture	procedure	third
45%	"	illustration	"	"
11%	"	demonstration	"	"
11%	"	trips	"	"
80%	rated	trips	procedure	fourth
20%	"	lecture	"	"

Of the three manipulative procedures, sixty-seven per cent of the schools used projects in the teaching of printing, twenty-two per cent used exercises, and eleven per cent used practicums. Again the project was the outstanding manipulative shop procedure, as shown in Figure 16.

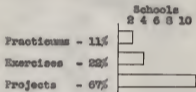


Fig. 16. Graph showing the manipulative shop procedures.

The special print shop was being used by seventy-eight per cent of the schools, and the composite shop was being used by only twenty-two per cent.

Part 6

Concrete and cement

Only sixteen per cent of the schools covered in the survey offered concrete and cement in their general shop course to the seventh, eighth, or ninth grades.

16	$\frac{2}{3}\%$	offered concrete and cement	to the 7th & 8th grades
16	$\frac{2}{3}\%$	" " " "	to the 8th & 9th grades
16	$\frac{2}{3}\%$	" " " "	to the 7th grade only
16	$\frac{2}{3}\%$	" " " "	to the 8th grade only
33	$\frac{1}{3}\%$	" " " "	to the 9th grade only

The number of weeks given to concrete and cement varied from two to thirty-six weeks. Twenty-nine per cent of the schools offered this subject for a period of two weeks, and twenty-nine per cent offered it for a period of twenty weeks.

Figure 17 illustrates the comparative number of weeks given to concrete and cement by the various schools.

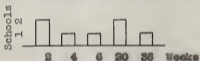


Fig. 17. Graph showing number of weeks given to concrete and cement.

The length of daily periods varied from forty-five to sixty minutes. Fifty-seven per cent of the schools used fifty-five minute periods, twenty-nine per cent used sixty minute periods, and fourteen per cent used forty-five minute periods.

Figure 18 illustrates the comparative length of daily periods used by the various schools.

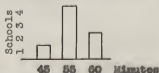


Fig. 18. Graph showing length of daily periods.

The methods of instruction used in the teaching of concrete and cement were given the following rating: group instruction, first; class instruction, second; and class instruction, third.

The rating of the methods of instruction by the various schools was as follows:

50% rated group instruction first
 33 $\frac{1}{3}$ % rated individual instruction first
 16 $\frac{2}{3}$ % rated class instruction first

50% rated class instruction second
 33 $\frac{1}{3}$ % rated group instruction second
 16 $\frac{2}{3}$ % rated individual instruction second

50% rated individual instruction third
 33 $\frac{1}{3}$ % rated class instruction third
 16 $\frac{2}{3}$ % rated group instruction third

Concrete and cement is the only subject taught in the general shop course where group instruction was rated first.

The teaching procedures were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth.

The various schools rated the teaching procedures for concrete and cement as follows:

50% rated demonstration first
 33 $\frac{1}{3}$ % rated lecture first
 16 $\frac{2}{3}$ % rated illustration first

50% rated illustration second
 50% rated demonstration second

50% rated lecture third
 33 1/3% rated illustration third
 16 2/3% rated trips third
 80% rated trips fourth
 20% rated lecture fourth

Eighty-six per cent of the schools used projects as their manipulative shop procedure, and fourteen per cent used exercises.

Fifty per cent of the schools used the special shop for concrete and cement, and fifty per cent of the schools used the composite shop. The special shop was used by the larger schools, while the smaller schools used the composite shop.

Part 7

General Metal

Thirty-four per cent of the schools covered in this survey offered general metal in their general shop course to the seventh, eighth, or ninth grades.

3%	offered general metal to all three grades
8%	" " " to the 7th and 8th grades
8%	" " " to the 7th and 9th grades
15%	" " " to the 8th and 9th grades
23%	" " " to the 7th grade only
23%	" " " to the 8th grade only
15%	" " " to the 9th grade only

The number of weeks given to general metal varied from two to forty weeks. Twenty-nine per cent of the schools offered this subject for a period of twenty weeks, and twenty-two per cent offered it for a period of eighteen weeks.

Figure 19 illustrates the comparative number of weeks given to general metal by the various schools.

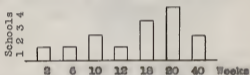


Fig. 19. Graph showing number of weeks given to general metal.

The length of daily periods varied from forty-five to ninety minutes. Thirty-four per cent of the schools used fifty-five minute periods, and twenty per cent used fifty minute periods.

Figure 20 illustrates the comparative length of daily periods used for general metal by the various schools:

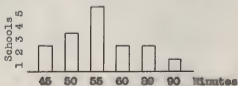


Fig. 20. Graph showing length of daily periods.

The methods of instruction used in the teaching of general metal were given the following rating: individual instruction, first; group instruction, second; and class instruction, third.

The rating of the methods of instruction were given by the various schools as follows:

45%	rated individual instruction first		
33%	" group	"	"
22%	" class	"	"

55%	rated individual instruction second		
34%	" group	"	"
11%	" class	"	"

75%	rated class instruction third		
25%	" group	"	"

The teaching procedures for general metal were given the following rating: demonstration, first; illustration, second; lecture, third; and trips, fourth.

The teaching procedures used in the teaching of general metal were rated as follows by the various schools:

90%	rated demonstration first
10%	rated lecture first

60%	rated illustration second
30%	rated lecture second
10%	rated demonstration second

60%	rated lecture third
40%	rated illustration third

100%	rated trips fourth
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All of the schools teaching general metal in their general shop course were using projects as their manipulative shop procedure. One-half of the schools were using the special shop, while the other half were using the composite shop.

Part B

Auto Mechanics

Only eleven per cent of the schools covered in this survey offered auto mechanics to the seventh, eighth or ninth grade.

23%	offered auto mechanics to the 7th grade only
29%	" " " to the 8th & 9th grades
44%	" " " to the 9th grade only

The number of weeks given to auto mechanics varied from two to nine weeks. Thirty-three and one-third per cent offered it for a period of six weeks, and thirty-three and one-third per cent offered it for a period of nine weeks.

The length of daily periods varied from fifty to ninety minutes. Forty per cent of the schools used sixty minute periods, twenty per cent used fifty-five minute periods, twenty per cent used fifty minute periods, and twenty per cent used ninety minute periods.

The methods of instruction were given the following rating: individual and class instruction, first; group instruction, second; individual and class instruction, third.

The rating of the methods of instruction for auto mechanics were given by the various schools as follows:

50% rated individual instruction first
 50% rated class instruction first
 100% rated group instruction second
 50% rated individual instruction third
 50% rated class instruction third

The teaching procedures were given the following rating: demonstration, first; lecture and illustration, second; illustration and trips, third.

The rating of the teaching procedures for auto mechanics was given by the various schools as follows:

66 $\frac{2}{3}$ % rated demonstration first
 33 $\frac{1}{3}$ % rated lecture first
 33 $\frac{1}{3}$ % rated lecture second
 33 $\frac{1}{3}$ % rated demonstration second
 33 $\frac{1}{3}$ % rated illustration second
 50% rated illustration third
 50% rated trips third

Seventy-five per cent of the schools offering auto mechanics in their general shop course used projects as

their manipulative shop procedure, and twenty-five per cent used exercises.

Seventy-five per cent of the schools used the special auto mechanics shop, and twenty-five per cent used the composite shop.

Part 9

Machine Shop

Sixteen per cent of the schools covered in this survey offered machine shop in their general shop course to the seventh, eighth, or ninth grades.

20%	offered machine shop to the 7th and 8th grades
40%	" " " to the 8th and 9th grades
20%	" " " to the 7th grade only
20%	" " " to the 9th grade only

The number of weeks given to this subject varied from two to thirty-six weeks.

The length of daily periods varied from fifty to sixty minutes. Forty-three per cent of the schools used sixty minute periods, forty-three per cent used fifty-five minute periods, and fourteen per cent used fifty minute periods.

The methods of instruction were given the following rating: individual instruction, first; group instruction, second; and class instruction, third.

The rating of the methods of instruction for machine shop was given as follows by the various schools:

80% rated individual instruction first
20% rated class instruction first

66 $\frac{2}{3}$ % rated group instruction second
33 $\frac{1}{3}$ % rated class instruction second

50% rated individual instruction third
50% rated class instruction third

The teaching procedures were given the following rating: demonstration, first; lecture, second; illustration, third; and trips, fourth.

The rating of the teaching procedures for machine shop was given as follows by the various schools:

80% rated demonstration first
20% rated lecture first

60% rated lecture second
20% rated demonstration second
20% rated illustration second

100% rated illustration third

100% rated trips fourth

Seventy-two per cent of the schools used projects as their manipulative shop procedure, fourteen and two-sevenths per cent used exercises, and fourteen and two-sevenths per cent used practicums.

Eighty-three and one-third per cent of the schools

used special machine shops, while sixteen and two thirds per cent used composite shops.

Part 10

Wood Pattern Making

Only two of the schools covered in this survey, both located in Illinois, offered wood pattern making in their general shop courses.

Both schools offered this subject to the ninth grade only. A period of six weeks was used by one school, and a period of eighteen weeks by the other. One of the schools used fifty minute periods, while the other used ninety minute periods.

Both schools rated demonstration teaching procedure first. Of the manipulative shop procedures, one school used exercises, and the other used projects. The special shop was used by both schools.

SUMMARY AND CONCLUSIONS

The general shop will not supplant the unit or single activity shop; the unit shop will always have a function to perform in many schools. However, the general shop will be used in schools where a series of unit shops are neither practicable nor possible (5).

The general shop should be a place of superior organization, a model of efficiency, both in arrangement of the equipment and in the conduct required of the pupil. A well equipped and well organized general shop provides the opportunity for a greater practical application of high grade initiative with the pupil than any other shop used for teaching the industrial arts.

Woodworking, as conclusively shown in the survey, is the subject most commonly taught in the general shop course. Subjects most frequently combined with it are mechanical drawing, general metal work and electricity. Other subjects offered, in the order of frequency of occurrence in the survey, are sheet metal, printing, general metal, machine shop, auto mechanics, concrete and cement, home mechanics, household mechanics, wood turning, carpentry, upholstering, plumbing, pipe fitting, bookbinding, wood pattern making, forging, acetylene welding, art metal,

weaving, art fibre, ceramics, electric welding, electroplating and photography.

The survey findings indicate that there should be not less than four class periods per week for any general shop subject. The sixty-minute period seems to be the most satisfactory.

The practical or manipulative shop work should not occupy more on the average than one-half of the total time allotted to the subject.

The general shop subjects, as the survey findings show, should serve as finding courses for the pupil as well as for the purpose of general education, and are usually required for the seventh and eighth grades and elective for the ninth grade.

The number of weeks given to each subject depends upon the number of subjects offered in the course. Some schools offer six six-week subjects in the seventh grade and three subjects in the first half of the eighth grade, all subjects being required, and allowing elective work in any one of the nine units in the last half of the eighth year. Other schools use a similar plan, using four nine-week subjects (9).

The required subjects are usually offered for a period covering from two to nine weeks, and the elective subjects

for a period covering from twelve to forty weeks.

The individual method of instruction, as so unanimously reported in the survey, is especially adapted to industrial arts classes because of the particular nature of the subjects taught and the type of students interested in industrial education. It demands that a large per cent of the instructor's time be devoted to the needs of individual members of the class, and, therefore, the individual differences in the pupils are cared for, eliminating much disinterest in the subject, loafing and failure.

The group method, rated second in the survey, may be used to advantage where several boys are working on the same job. Time is saved for the instructor by giving instruction to several boys on the same topic, but there are disadvantages in using this method. It is used principally in the composite shop in smaller schools.

The class method, rated third in the survey, is in more general use in academic subjects, and in general shop subjects where the special shop is used. It is practical only for the purpose of giving general information and instruction.

The demonstration, which is the outstanding teaching procedure, is the presentation by the teacher of the manipulative procedures of the projects taught. The illustration,

rated second, is not as effective as the demonstration. The lecture, rated third, is more generally used in academic subjects, and is used effectively only in presenting related information pertaining to the manipulative procedures. Trips to industrial plants are profitable, however, they are seldom used. Other procedures used are moving pictures and slides, charts and pictures, objective tests, job sheets, instruction sheets, magazines, texts and reference books.

It is evident that the project as a manipulative shop procedure presents the best teaching opportunity, stimulates creative thinking, makes possible a maximum teaching of related subject matter, and permits the caring for individual differences in students. The exercise, rated second, is successfully used in teaching the first tool processes, but does not furnish a ready opportunity for wide instruction. The practicum, rated third, presents opportunity for the teaching of skill, with little related information or motivation of pupil interest.

From teaching experience the writer has observed that the special shop affords greater opportunity in class organization and instruction, but demands more equipment. The composite shop, on the other hand, provides general shop instruction with less equipment, however, with less efficiency.

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