TO DETERMINE THE VALUE OF WORK EXPERIENCE

FOR PROSPECTIVE INDUSTRIAL

ARTS TEACHERS

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THESIS

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By

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CHAPTER I

INTRODUCTION

Teachers of all subjects begin their teaching careers classified as inexperienced. This not only means that teaching is new to them but that in subject matter to be taught they are only beginners. In no other subjects is this more true than those in which manipulative skills are involved. One function of the teacher-training institutions is to prepare prospective industrial arts teachers by practice, in planning and doing, which will allow them to teach the rudiments of the various types of work included in that field.

Industrial arts as taught in our high schools includes work in many of the trades and crafts at which one must work for a number of years before becoming a skilled journeyman. Frank C. Moore, who is director of industrial arts of the Cleveland, Ohio, Public Schools and vice-president of the Industrial Arts Section of the American Vocational Association tells us:

> Teaching is occasioning those activities in the mind of the learner which result in knowledge, power, and skill.
>
> Teachers of industrial arts must select from the vast field of knowledge that which is important, that which is useable, and above all that which fits into the child's experiences and falls within his ability to understand and use.

> "Power" is the ability to use this knowledge in the solution of worthwhile practical problems. "Skill" is the ability to use knowledge and power effectively and efficiently.[1]

If skill is the tying together of knowledge and power, it is surely one of the fundamentals of industrial arts which is part of our general education. What, the, can prospective industrial arts teachers do to gain skill? Should they acquire skill by practical work experience in the subjects they are to teach or can they acquire adequate skills in several trades from the courses taught in College? This brings us to a question of much importance to "teacher-training" institutions.

They must determine skill is of more importance than heretogore thought and if so how their graduates can be given the opportunity for work experience. It is possible that research on this question may help narrow the gap in efficiency between beginning industri[illegible]rts teachers and those with several years teaching ex[illegible]

Statement of the [illegible]

The problem of this study is t[illegible] work experience for the prospective industrial arts teacher. In making this study the following items are of prime importance: (1) What units are taught that require some degree of manipulative skill? (2) What other fun[illegible]tions in school

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[1]Frank C. Moore, "Improving Instruction in Industrial Arts," American Vocational Journal, Vol. 22, No. 1 (May, 1947), p. 7.

and community life fall upon the industrial arts teacher which could better be performed by the teacher with a work experience background? (3) What are the opinions of industrial arts teachers already in service toward work experience? (4) What are the opinions of teacher trainers and supervisors or administrators on work experience? Another important item is the methods by which teacher-training institutions can provide opportunities for work experience for their prospective industrial arts teachers.

Delimitations

This study is limited to industrial arts as taught in the high schools of Texas. Information received from industrial arts teachers, supervisors, administrators and teacher trainers of Texas is the major source of data for this study.

Definition of Terms

Industrial Arts, as used in this study, refers to non-vocational activities in the field of industrial education. It has for its purpose, giving information about and experience in the use of tools, materials and processes incident generally to the home and manufacturing industry.

Work experience is time spent working at some phase of industrial arts where proficiency in problem solving, manipulative skills and general information is increased.

Unit as used in reporting this study does not refer to credits available in the various schools but refers to

divisions or phases of work offered under one or more subjects. For example, in shop II for the nineth grade a student may work in bench metal, welding, sheetmental and forging, four units or phases of work for which one-half credit is given.

A supervisor is one whose duties are confined to planing, directing, and improving the industrial arts curriculum and observing and improving the teaching of these subjects in a single school system.

An administrator has the same duties as a supervisor except that his work covers more than one school system, such as specialists of the state department of education and districts of the state department, or executives of an association.

A teacher trainer is one who directs the training of prospective industrial arts teachers.

Method of Procedure

The questionnaire method was used to collect data for this study. To secure information concerning the units offered in their schools, the functions in their field outside of teaching they are asked to do, and their opinions concerning the value of work experience, a letter (Form No. 1) and a questionnaire (Form No. 2) were sent to one hundred sixty-three industrials arts teachers distributed geographically over the whole of Texas.

To secure information from industrial arts supervisors and administrators concerning some deficiencies of industrial

arts teachers and their opinions on how work experience can make for an enriched teaching program in industrial arts, a letter (Form No. 3) and a questionnaire (Form No. 4) were sent to twelve supervisors distributed over the state and four administrators in the state department of education. The same questionnaire was sent to twelve industrial arts teacher trainers in the senior colleges of Texas.

Personal observations were used to determine opportunities available and methods to use in providing for work experience.

Recent Studies in the Field

There have been few studies made concerning work experience for industrial arts teachers. However, several writers in recent years have called attention to manipulative skills required for teachers in the field. During, and immediately following, the recent war very few studies have been undertaken that were not either directly or indirectly concerned with national defense, war production training, military training and other phases of the national emergency.

One study completed in 1941 was undertaken by the Committee on Research of the National Association of Industrial Teacher Trainers, an affiliate of the American Vocational Association, in response to requests from members at its meeting in St. Louis in December, 1938. The study was planned to investigate the educational preparation of industrial arts teachers throughout the United States. The

following comments concerning trade experience of industrial arts teachers in teacher-training institutions are taken from this study:

> Some time in their careers, 247 or 75 percent of the instructors have had trade or industrial experience varying in time from one to thirty-two years. One third of this group have had one to six years. There should be much valuable technical instructional material and guidance information to pass on to beginning teachers with this array of practical industrial experience represented in the industrial arts teacher education facilities . . .
> . . . . . .
>
> There are 1,218 years represented, with an average of 3.7 years per man based on the total of 329 instructors. The average, based on 247 instructors is, practically, five years.
>
> Industrial experience likely will continue to be one of the credentials of industrial arts teacher educators. With the increasing demand to make education more and more world-like, a good place to start is in the colleges where the teachers are prepared. Many school systems require industrial experience of their industrial arts teachers. How otherwise, except from books, could industries be interpreted? Several colleges that reported, require summer industrial experience of their graduates.[2]

In the same study the teacher-training institutions were asked, "In training teachers, are you placing emphasis on information, manipulative skill, or a balance of the two, according to the kind of work"?[3] Eighty of the ninety schools responding stated that they follow a balance of the two. Three stressed information and four stressed manipulative skill.

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[2]Verne C. Fryklund, Industrial Arts Teacher Education in the United States, Bulletin No. 2, National Association of Industrial Teacher-Trainers Affiliated with the American Vocational Association, 1941, p. 26-27.

[3]Ibid., p. 96.

William T. Bawden, Head of Department of Industrial Education, Pittsburg, Kansas State Teachers College before retiring in 1945, and a leading industrial education teacher-trainer for the last quarter century, recognizes the problem of gaining skills in several trades in the ordinary four-year curriculum. His comments that follow seem to lend importance to the results that can be gained from this study.

> The accepted minimum qualifications of character, personality, appearance, health, vitality, and leadership ability apply to the shop teacher equally with all other teachers; and, in addition, to succeed as a shop teacher one must possess versatility, adaptability, initiative, and first-hand knowledge of industry and of industrial processes.
>
> Finally, we can all agree that the shop teacher must possess the requisite knowledge and skills in the industrial-arts shopwork and drafting subjects he may be called upon to teach.
>
> . . . . . .
>
> From the standpoint of the typical teacher-training institution, the necessary facilities and personnel for preparing competent teachers in a dozen or fifteen shop subjects, in addition to drafting and design, are quite beyond the realm of possibility. From the standpoint of the individual student, the prospective teacher in training, if he succeeds in mastering the elementary processes for four or five shop subjects in the four-year undergraduate curriculum, he is well above average.
>
> . . . . . .
>
> Leaders in the movement for teacher education in industrial-arts have for some time been concerned with the problem of graduate work. Adequate preparation of the industrial-arts teacher seems clearly too great a task for the typical four-year curriculum. As has been pointed out, the industrial-arts teacher needs all the personal and professional qualities that we expect of any other teacher, and in addition, special skills and background that are not required of any other teacher.
>
> . . . . . .
>
> Every prospective teacher of English or mathematics enters upon the four-year teacher-college

> course with a background of from six or eight to ten years of study of the subjects in which he elects his "major". Almost never does the student who elects an industrial-arts major possess anything approaching this familiarity with the field in which he plans to teach. In many cases, he presents himself with no previous instruction whatever in shopwork or drafting. Time must be taken, therefore, from the all-too-short period of four years to build a background and to achieve proficiency in the rudiments of at least three or four branches of shopwork.
>
> Realization of our inability to do a satisfactory job in four years causes us to welcome the opportunity to add a fifth year of graduate study leading to the Master's degree. And it is because we see so many things that we fail to accomplish in four years that we have such great diversity of opinion as to what is best to do in the fifth year. Here is one of the great challenges and one of the great opportunities in the outlook for teacher education in industrial-arts.[4]

Kenneth Beach, Supervisor, Bureau Industrial and Technical Education for the New York State Department of Education, says teachers lower standards where they are required to teach skill subjects in several industrial fields. In the paragraphs that follow he points out reasons for low standards and suggests that it is up to teacher-training institutions as well as school boards to bring about the raising of standards for teachers of industrial arts.

> The industrial-arts teacher today must concern himself with developing in the pupil an active interest in industrial life, avocational activities, creative expression, educational guidance, self-reliance and confidence, orderly methods of procedures, consumer education, good

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[4] William T. Bawden, "The Outlook for Teacher Education in Industrial Arts," Education, Vol. 65, No. 10 (June, 1945), pp. 624-629.

work habits, and cooperation. In addition, the teacher is expected to teach in several industrial fields such as woodworking, auto mechanics, printing, textiles, mechanical drawing, general metal work, ceramics, and electricity.

Need for Higher Standards

This lowering of standards in the workmanship and quality of projects produced is a serious handicap to industrial-arts education and a real detriment to the pupil.

. . . . . .

Holding him to high standards of workmanship is necessary to achieve the objectives of industrial-arts education. How can habits of self-discipline, careful and thoughtful work, the ability to perform elementary skills with tools and an appreciation of good workmanship be developed in the pupil unless high standards are required?

. . . . . .

Another reason why high standards of workmanship should be required is the pre-vocational aspect that industrial arts hold---particularly in the junior and senior years of the senior high school years, it is generally agreed that, if the training is properly given in the latter years, it closely approaches that of vocational education.

Suggestions for Raising Standards

The responsibilities for the above conditions fall basically upon the shoulders of industrial-arts teacher-training institutions and state education departments responsible for setting up certification requirements. The development of the general shop has placed a requirement on the industrial-arts teacher for skills in several fields. As a result, many prospective teachers in their training institutions do not receive sufficient training in any particular field. The training in several fields is spread so thin that standards of performance are considerably reduced . . . It is apparent that the teacher cannot expect good work from his pupils unless he, himself, can do good work.[5]

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[5]Kenneth Beach, "Let Us Keep Our Sights Up," Education, Vol. 63, No. 8 (April, 1943), pp. 458-460.

Ralph W. Whalin, Chairman of the Industrial Arts Department, Eastern Kentucky State Teachers College, has given opportunity for production work to prospective industrial arts teachers at his institution. His description of this program follows.

> The prospective teacher of industrial arts should have broad knowledge and much skill. Yet the latter is difficult to achieve in the average teacher-training institution because of time limitations. Many courses outside of the industrial-arts department are important and necessary for the student. Extra-curricular and outside interests beckon him. However, it is not beyond the realm of possibility to develop in students a rather high degree of manipulative skill.
>
> It is becoming increasingly certain that a teacher cannot be trained in several divisions of an industrial-arts department under a 24 or 30 semester-hour curriculum. Many institutions have long ago accepted this and now require from 40 to 50 semester hours in the major field . . .
>
> Although this is a rather large number of hours to acquire in one field, it is still often difficult to develop a very high degree of skill when this time is spread over 10 to 12 trades. A relatively short period may be devoted to a single division of the department.
>
> In our institution we have recognized this and are attempting to supplement our students' training with some form of production work. Credit is not given, but the students are paid by the hour. This part of our training program usually operates from three to four hours each day. It is under the direction of a faculty member and student foreman.
>
> The program consists of building laboratory furniture and office equipment; machine-shop, welding, sheetmetal maintenance work; and construction work for the college . . .
>
> A majority of our students receive what is equal to two or three years of actual trade experience while in training.
>
> . . . . . .
>
> Whenever we cease to prepare industrial-arts teachers without a rather high degree of skill in several divisions of our field or

> without some mark of a craftsman, we might as well put away our tools and seek some other vocation.[6]

It is one of the objectives of this study to determine whether work such as is described above is recommended by industrial arts teachers, supervisors, and teacher trainers.

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[6]Ralph W. Whalin, "Production Work in Teacher Training," School Shop, VI (December, 1946), pp. 8-10.

CHAPTER II

DIVERSIFICATION OF SUBJECTS TAUGHT UNDER INDUSTRIAL ARTS

Only by making a survey of the different units that are being offered in Texas in the field of industrial arts, can one see how broad is the field, how numerous are the offerings, and how involved is the work. Granting that no one teacher must teach all of the units at one time does not decrease from the importance of being able to teach as many as possible. Many times a teacher whose efforts are confined to a narrow field may lose an opportunity for a job with better pay under better teaching conditions. Positions of supervisors and administrators are usually offered to those whose experiences and capabilities are evident in several phases of industrial arts.

The data presented in Chapter II and III are taken from questionnaires received from one hundred and ten industrial arts teachers in the high schools of Texas. This figure represents sixty-seven per cent of the one hundred and sixty-three sent out. In a few cases more than one teacher represents the same school but the nature of this study calls for data as they apply to each individual rather than to the school which he represents.

From a list of twenty-five of the most common units of work offered in the field of industrial arts, teachers were

asked to check the ones offered in their school. These units were divided under three main divisions of the field; woodwork, metalwork and drawing, plus four units listed under miscellaneous.

Table 1 shows the scope of the industrial arts program in the schools of one hundred ten teachers. One hundred

TABLE 1

OFFERINGS OF SCHOOLS REPRESENTED BY 110 INDUSTRIAL ARTS TEACHERS

TEACHER	Wood Working									Metal Work							Drawing						Misc				TOTAL
	Hand Woodworking	Machine Woodworking	Carpentry	Wood Turning	Pattern Making	Wood Carving	Finishing	Refinishing		Bench Metal	Forging	Machine Shop	Welding	Sheet Metal	Farm Shop	Auto Mechanics	Free Hand Sketching	Machine Drawing	Developing	Architectural Drawing	Cabinet & Furniture Design	Blue Printing	Electricity	Concrete Work	Handicrafts	Pipe Work & Plumbing	
1	X	X		X			X										X										5
2	X	X		X	X		X	X		X							X	X	X	X	X	X			X		14
3	X	X	X	X		X	X	X									X	X			X	X	X		X	X	14
4	X	X	X	X			X	X		X	X	X	X		X		X	X	X		X	X		X		X	18
5	X	X		X		X	X	X		X	X	X	X	X			X	X	X	X	X	X	X		X		19
6	X	X		X		X	X	X		X	X	X	X	X			X	X	X	X	X	X	X				17
7	X	X		X	X		X	X		X	X	X	X	X			X	X	X	X	X	X	X				19
8	X	X	X	X	X	X	X	X		X	X	X	X	X			X	X	X	X	X	X	X				20
9										X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	16
10	X	X	X	X			X	X		X			X				X	X	X	X	X	X	X		X		15
11	X	X		X			X	X		X	X	X	X	X			X	X	X	X	X	X					16
12	X	X		X			X	X				X		X		X	X	X		X		X	X				12
13	X	X		X												X	X	X		X		X					7
14	X	X		X		X	X	X					X			X	X	X	X	X	X	X						14
15	X	X	X	X		X	X	X									X	X	X	X		X						12

TABLE 1 (Continued)

TEACHER	Wood Working								Metal Work							Drawing					Misc				TOTAL
	Hand Woodworking	Machine Woodworking	Carpentry	Wood Turning	Pattern Making	Wood Carving	Finishing	Refinishing	Bench Metal	Forging	Machine Shop	Welding	Sheet Metal	Farm Shop	Auto Mechanics	Free Hand Sketching	Machine Drawing	Developing	Architectural Drawing	Cabinet & Furniture Design	Blue Printing	Electricity	Concrete Work	Handicrafts	Pipe Work & Plumbing	
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X			X	21
17	X	X		X	X	X	X	X	X		X	X	X		X	X	X	X	X	X						17
18	X	X	X	X		X	X	X								X	X		X	X	X					12
19	X	X		X			X	X								X	X									7
20	X	X		X			X	X								X	X	X	X	X						10
21	X	X		X	X		X	X	X	X	X	X	X			X	X	X	X	X	X				X	18
22	X	X		X			X	X								X	X	X	X	X						10
23	X	X		X			X				X	X					X		X		X					9
24	X	X		X			X	X											X							6
25	X	X	X	X	X	X	X	X				X		X		X				X		X		X		14
26	X	X		X			X	X								X	X	X	X		X					10
27	X	X		X			X	X								X	X	X	X							9
28	X	X		X			X	X	X	X	X		X			X	X	X	X	X	X	X				16
29	X	X	X	X			X	X								X	X	X	X	X	X					12
30	X	X		X			X	X																		5
31	X	X		X			X	X								X	X	X	X		X					10
32	X	X		X	X		X	X								X	X	X	X	X	X					12
33	X	X		X		X	X	X	X	X	X	X	X			X	X	X	X	X	X	X		X		19
34	X	X		X			X	X		X		X	X			X	X		X	X	X	X				15
35	X	X		X			X	X	X		X	X	X		X	X	X	X	X		X	X				16
36	X	X					X	X													X					5
37	X	X	X	X	X		X	X								X	X	X	X		X			X		13
38	X		X	X		X	X	X								X	X		X	X	X					10
39	X	X		X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	A	X		21
40	X	X	X	X			X	X		X						X	X	X	X	X	X					12
41	X	X		X			X	X	X	X	X	X		X	X	X	X				X	X			X	15
42	X	X		X			X	X						X		X	X			X	X			X		11
43	X	X		X	X		X	X			X	X	X			X	X	X			X					14
44	X	X		X			X	X			X	X	X		X	X	X	X		X		X	X		X	16
45	X	X		X			X	X								A		X	X							8
46	X	X		X		X	X	X	X	X			X		X		X	X			X	A		X		15

TABLE 1 (Continued)

TEACHER	Woodworking								Metal Work						Drawing					Misc			TOTAL
	Hand Woodworking	Machine Woodworking	Carpentry	Wood Turning	Pattern Making	Wood Carving	Finishing	Refinishing	Bench Metal	Forging	Machine Shop	Welding	Sheet Metal	Farm Shop	Auto Mechanics	Free Hand Sketching	Machine Drawing	Developing	Architectural Drawing	Cabinet & Furniture Design	Blue Printing	Electricity	Concrete Work	Handicrafts	Pipe Work & Plumbing	
47	X	X	X	X			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	20
48	X	X		X			X	X	X	X	X	X	X			X	X	X	X							12
49	X	X	X	X	X		X	X	X	X	X	X	X			X	X	X	X	X	X	X			X	20
50	X	X	X	X			X	X	X	X				X										X		11
51	X	X		X			X	X	X		X	X	X							X	X					11
52	X	X		X			X	X	X				X		X	X	X	X				X		X		13
53	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X		X	X	X	X		X	X	22
54	X	X		X			X		X				X			X	X			X	X	X				12
55	X	X		X			X	X	X	X			X													8
56	X	X		X			X	X																		5
57	X	X		X			X	X								X	X	X								9
58	X	X	X	X			X									X	X	X	X	X	X					11
59	X	X		X		X	X		X	X	X	X	X		X	X	X	X	X	X	X					16
60	X	X		X			X	X																		4
61	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X			X	22
62	X	X		X			X									X	X	X		X	X					9
63	X	X	X	X		X	X									X	X	X	X	X	X					10
64	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X			X	19
65	X	X	X	X	X	X	X	X								X										9
66	X	X	X	X			X										X	X	X	X	X					9
67	X			X			X								X	X	X	X	X							8
68	X	X		X			X	X								X	X		X	X	X					10
69	X	X	X	X			X	X								X	X		X	X	X			X	X	10
70	X	X		X	X	X	X	X	X	X	X	X				X	X	X	X	X	X		X	X	X	19
71	X	X		X	X		X				X	X	X		X	X	X	X	X				X	X		17
72	X	X		X			X				X		X			X	X	X		X	X	X				13
73	X	X	X	X		X	X	X	X	X	X		X			X	X	X			X					14
74	X	X		X		X	X									X	X	X		X						9
75	X	X	X	X			X	X	X	X	X	X	X			X	X	X	X	X	X					17
76	X	X	X	X			X	X								X	X	X	X	X	X					12
77	X	X		X			X	X				X		X	X	X	X		X			X	X			11
78	X	X		X		X	X	X	X				X		X	X								X		8

TABLE 1 (Continued)

TEACHER	Woodworking								Metal Work							Drawing					Misc				TOTAL
	Hand Woodworking	Machine Woodworking	Carpentry	Wood Turning	Pattern Making	Wood Carving	Finishing	Refinishing	Bench Metal	Forging	Machine Shop	Welding	Sheet Metal	Farm Shop	Auto Mechanics	Free Hand Sketching	Machine Drawing	Developing	Architectural Drawing	Cabinet & Furniture Design	Blue Printing	Electricity	Concrete Work	Handicrafts	Pipe Work & Plumbing	
79	X	X	X	X		X	X	X								X	X	X	X	X	X					13
80	X	X	X	X			X	X	X	X	X		X			X	X	X	X	X	X	X				17
81	X	X		X			X	X	X	X	X	X	X			X	X	X	X	X	X					16
82	X	X		X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X			X		19
83	X	X		X			X	X																		4
84	X	X		X			X	X	X	X		X	X													8
85	X	X	X	X			X	X											X							7
86	X	X		X			X	X							X	X	X	X	X		X			X		12
87	X			X		X	X	X	X				X		X	X			X	X				X		9
88	X	X	X	X			X	X						X		X	X		X	X	X					12
89	X	X		X		X	X	X				X			X	X	X	X	X	X	X	X		X	X	16
90	X	X				X	X	X																		6
91	X	X		X			X	X	X		X	X	X		X	X	X		X		X			X		15
92	X	X	X	X			X	X		X				X		X										8
93	X	X		X			X	X	X		X	X	X			X	X	X	X	X	X	X		X		17
94	X	X		X			X	X								X	X	X	X			X				9
95	X						X	X									X									3
96	X	X	X	X			X	X								X	X	X	X	X	X	X				11
97	X	X	X				X	X								X	X	X	X					X		10
98	X	X		X			X	X												X	X					7
99	X	X		X			X	X						X		X	X	X				X		X		11
100	X	X		X			X	X	X	X	X		X		X	X	X	X	X		X	X				16
101	X	X	X	X			X	X								X	X	X	X							9
102	X	X		X			X	X									X	X			X					7
103	X	X	X	X			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		19
104	X	X	X	X			X	X																		6
105	X	X	X	X	X	X	X	X			X	X	X		X	X	X	X	X		X	X				16
106	X	X	X	X		X	X	X								X	X	X	X		X					13
107	X	X		X		X	X	X		X	X	X	X			X	X	X	X	X	X					16
108	X	X		X			X	X								X	X	X	X		X					11
109	X	X		X			X	X		X	X	X	X			X	X	X	X		X					15
110	X	X	X	X		X	X	X			X	X	X		X	X	X	X	X	X	X	X		X		21

nine teachers, or ninety-nine per cent, show that at least some units in woodwork are offered in their school. Teacher number nine reported no woodwork however, he shows such a complete program in the divisions of metalwork, drawing and miscellaneous units that one might believe that woodworking was overlooked in completing the questionnaire. The Table also shows that ninety-nine per cent of the teachers reported a division of mechanical drawing in their program. Sixty-one per cent offer metalwork and forty-eight per cent offer one or more of the miscellaneous units, which are electricity, concrete work, handicrafts, and pipe work and plumbing. Sixty-two or fifty-six per cent reported offerings in all three of the major divisions.

Table 2 gives a breakdown of the frequency with which units are offered in each of the divisions. Hand woodworking and woodturning are the most popular units in the woodworking division. Each is reported by one hundred nine teachers which is ninety-nine per cent of those reporting. Finishing and machine woodworking were also reported by more than ninety per cent of those responding. Pattern making is by far the least popular of the woodworking units since it was checked on only seventeen, or fifteen per cent, of the questionnaires.

TABLE 2

FREQUENCY OF OFFERINGS IN SCHOOLS REPRESENTED BY 110 INDUSTRIAL ARTS TEACHERS

Unit	Number of Teachers Whose School Offers Unit	Per Cent of Teachers Whose School Offers Unit
Woodworking		
Hand Woodworking	109	99
Machine Woodworking	102	93
Carpentry	37	34
Wood Turning	109	99
Pattern Making	17	15
Wood Carving	32	29
Finishing	106	96
Refinishing	86	78
Metal Work		
Bench Metal	52	47
Forging	39	35
Machine Shop	43	39
Welding	44	40
Sheet Metal	49	45
Farm Shop	15	14
Auto Mechanics	24	22
Drawing		
Free Hand Sketching	86	78
Machine Drawing	85	77
Developing	66	60
Architectural Drawing	71	65
Cabinet & Furniture Design	59	54
Blue Printing	68	62
Miscellaneous		
Electricity	32	29
Concrete Work	4	04
Handicrafts	30	27
Pipe Work & Plumbing	12	11

In the metalwork division bench metal and sheet metal lead, being reported fifty-two and forty-nine times respectively. Farm shop and auto mechanics are reported with the least frequency, both being mentioned on less than twenty-five per cent of the questionnaires. Machine shop, welding, and forging are grouped closely behind bench metal and sheet metal, in fact, close enough for all five to be considered as units to be offered in a program of general metalwork.

Drawing seems, according to Table 2, the most well-balanced of all the divisions as all units were checked from fifty-nine to eighty-six times or by from fifty-four to seventy-eight per cent. Free hand sketching is offered most frequently could well be the fact that it is used in all shops to show quickly, details and parts in conversation between students and in "shop talks" by the instructor. Machine drawing probably ranks high because it has been used extensively in the past for developing mechanical skill, accuracy, neatness and technique of students of drawing. Actually, all of the other phases of drawing are used more in conjunction with all of the miscellaneous types of shop and home work.

Of the units listed under miscellaneous, only electricity and handicrafts are being offered with any degree of

regularity. They have been developed as a course in recent years and handicraft appears to be one of the fastest growing units of any in the field. It seems that the main cause of its fast development is the new industrial growth in plastics, dyes, plexiglass, and tools and machines to work with them.

Concrete work is practically non-existent in the industrial arts curriculum as it was checked only four times by the teachers responding. There are several causes that may be keeping work in concrete and mortar from being made available to students:

(1) Concrete must be poured at the place it is to remain.

(2) School is not a desirable place for storing and mixing materials that go into concrete.

(3) Forms must be built and installed at the place of pouring.

(4) When a concrete project is started it cannot be stopped until it is completed.

(5) Teachers have not had experience or training in concrete work.

Actually many concrete and mortar jobs or repairs can be done around homes and businesses with a minimum amount of training.

Pipe work and plumbing, which was checked by twelve teachers has been of minor importance as a unit to offer students of industrial arts. The small amount of plumbing

that is offered is usually done in conjunction with a bench metal or a general metal class. Even though most homes, school buildings and business buildings are now equipped with some type of plumbing,and many are equipped completely with all the latest plumbing products, schools are not offering any work even in the upkeep and repair of such equipment.

Here again one may wonder why experience in such a field as plumbing, which affects our home and industrial life so universally is left out of the industrial arts curriculum in practically all schools. When the so-called "skill" subjects were taught in the old manual training shops plumbing was practically non existent. Most of the skill subjects have been carried on in some degree and a few others have been added. Plumbing has not been added to the industrial arts curriculum as yet.

The twenty-five units making up all of the divisions are ranked in Table 3 according to the frequency with which they are checked. The woodworking division claims the four top ranking units with a fifth unit ranking five and one-half, along with the highest ranking unit in the division of drawing. All of the units in drawing are ranked consecutively from five and one half through eleven. The next five ranks, twelve through sixteen, all fall to the division of metal work. The nine units ranked from seventeen through twenty-five are made up of three units from woodwork, two units from metalwork and

TABLE 3

RANK OF OFFERINGS IN SCHOOLS REPRESENTED
BY 110 INDUSTRIAL ARTS TEACHERS

Units Offered	Frequency	Rank
Hand Woodworking	109	1.5
Wood Turning	109	1.5
Finishing	106	3
Machine Woodworking	102	4
Refinishing	86	5.5
Free Hand Sketching	86	5.5
Machine Drawing	85	7
Architectural Drawing	71	8
Blue Printing	68	9
Developing (Sheet Metal)	66	10
Cabinet &Furniture Design	59	11
Bench Metal	52	12
Sheet Metal	49	13
Welding	44	14
Machine Shop	43	15
Forging	39	16
Carpentry	37	17
Wood Carving	32	18.5
Electricity	32	18.5
Handicrafts	30	20
Auto Mechanics	24	21
Pattern Making	17	22
Farm Shop	15	23
Pipe Work & Plumbing	12	24
Concrete Work	4	25

the four units which were grouped under"Miscellaneous." As a division, woodworking ranks first with an average frequency of seventy-five, followed by drawing, metalwork and miscellaneous with average frequencies of seventy-two, thirty-eight and eighteen respectively.

It is interesting to note that two schools offer twenty-two of the twenty-five units and eight schools offer twenty or more units. This is shown in Table 4. Only three

TABLE 4

SCHOOLS REPRESENTED OFFERING COMPARATIVE NUMBER OF UNITS

Number of Units Offered	Number of Schools Offering Units
22	2
21	3
20	3
19	7
18	2
17	6
16	11
15	6
14	6
13	5
12	11
11	8
10	9
9	10
8	6
7	5
6	3
5	4
4	2
3	1

schools offer less than five units. Seventy, or sixty-four per cent of the schools offer eleven or more units. The average offering of the schools represented is approximately thirteen units. This gives a clear picture of the diversity of the industrial arts program in the Texas high schools. It also shows the many different types of work an industrial arts teacher may be called upon to teach even in his first year of teaching.

CHAPTER III

FUNCTIONS PERFORMED BY INDUSTRIAL ARTS TEACHERS THAT FALL WITHIN THE SCOPE OF THEIR TEACHING FIELD

Functions Performed For The School

In most schools teachers are asked to perform functions for the school or community that fall within the scope of their teaching fields. There is reason to believe that industrial arts teachers, due to the nature of their field, are asked to perform or have their classes perform many functions in connection with constructing, maintaining, and repairing equipment and apparatus for the school in which they teach.

There are those who would denounce this practice and there are those who would have it in their school. It is outside the realm of this study to judge the merits of either practice. It was a part of this study, however, to determine how extensively this practice is carried on in the field of industrial arts and what per cent of the teachers are asked to participate in such functions besides keeping up their regular class work. There is a possibility that if it is a common practice for industrial arts teachers to furnish a large part of the work required to maintain a school plant, they will be better prepared to do so if they have a more diversified work experience background.

Part II of the questionnaires sent to the industrial arts teachers contained twenty-seven "typical" jobs or functions grouped under the divisions of woodwork, mechanical drawing, metalwork and miscellaneous. These twenty-seven jobs are not meant to be a complete list of jobs but a list of sample or typical jobs compiled by the author from eight years of school maintenance experience and checked by one who has spent twenty-four years supervising various types of maintenance work. They were also compared with jobs commonly performed in the maintenance shop of this institution. Teachers were asked to check the jobs that they had been asked to perform.

First to be considered is the number of teachers indicating that they participate in the performance of many of these jobs and to what degree. Only three teachers out of the one hundred ten indicate that they do not do any extra jobs for their school in any manner. This is shown in Table 5.

TABLE 5

DISTRIBUTION OF TEACHERS ACCORDING TO NUMBER OF TYPICAL JOBS CHECKED

Number of Jobs Checked	Number of Teachers	Per Cent of Jobs Checked
27	2	100
26	2	96
25	1	93

TABLE 5 (Continued)

Number of Jobs Checked	Number of Teachers	Per Cent of Jobs Checked
24	5	89
23	2	85
22	2	81
21	1	77
20	2	74
19	2	70
18	5	67
17	4	63
16	10	59
15	4	56
14	8	52
13	6	48
12	5	44
11	4	41
10	3	37
9	10	33
8	5	30
7	7	26
6	4	22
5	5	19
4	1	15
3	3	11

TABLE 5 (Continued)

Number of Jobs Checked	Number of Teachers	Per Cent of Jobs Checked
2	3	7
1	1	4
0	3	0

The other one hundred seven teachers take part in school maintenance activities in varying degrees, one teacher checking only one job and two teachers checking all twenty-seven or one hundred per cent of the jobs listed. It can readily be seen that ten teachers checked nine or thirty-three per cent of the twenty-seven jobs, and ten teachers checked sixteen or fifty-nine per cent of the jobs. Fifteen teachers or fourteen per cent checked over seventy-five per cent of the jobs and fifty teachers, which is forty-five per cent of the total, checked over fifty per cent of the jobs lists. The average number of jobs checked by the one hundred seven teachers is twelve and nine-tenths. This indicates that as a group, the industrial arts teachers of Texas can expect to perform jobs such as upkeep and repair at almost any school in which they teach.

Next to be considered are the jobs an industrial arts teacher will most likely be asked to perform for the school in which he teaches. Table 6 gives the number of teachers

checking each job listed in the questionnaire.

TABLE 6

FUNCTIONS WHICH INDUSTRIAL ARTS TEACHERS ARE ASKED TO PERFORM

Typical Jobs	Number of Times Checked and Per Cent of 110 Teachers Responding	
	Number	Per Cent
Wood Work		
Build book shelves for your school	83	75
Help build stage equipment and scenery	90	82
Plane off doors	54	49
Replace broken window panes	33	30
Repair or build playground equipment	62	56
Repair equipment and apparatus in the gymnasium	65	59
Repair loose hinges	43	39
Repair or make bulletin boards and picture frames	86	72
Repair a broken chair	90	82
Mechanical Drawing		
Layout playground areas	26	24
Draw projects for students to build	66	60
Sketch or draw out something a teacher or the school wants to build	66	60
Draw plans for an addition or repairs to your school	37	34
Make charts or posters for the school	56	51
Figure floor space in your school building	31	29

TABLE 6 (Continued)

Typical Jobs	Number of Times Checked and Per Cent of 110 Teachers Responding	
	Number	Per Cent
Miscellaneous		
Advise or help in concrete and mortar work	20	18
Replace burned out fuses	48	44
Repair faulty electric extensions, outlets, or switches	49	44
Oil electric motors or fans	54	49
Metal Work		
Repair door closers	28	25
Weld broken equipment	45	41
Tighten a leaky pipe	16	15
Solder a broken instrument	53	48
Sharpen cutting tools	69	63
Straighten bent playground equipment or other apparatus	41	37
Make sheet metal repairs	30	27
Repair yard tools	39	35

Of the jobs listed under woodwork, building stage equipment and scenery was checked by ninety teachers, as was repairing broken chairs. This is eighty-two per cent of the one hundred ten teachers responding. Two of the most difficult jobs listed under woodwork, repairing and building playground equipment and repairing equipment and apparatus in the gymnasium, were checked by fifty-six and

fifty-nine per cent of the teachers respectively. Four more jobs distributed among the other three divisions were checked by more than fifty per cent of the teachers.

The jobs listed under woodwork were generally checked by a larger number of the teachers with those under mechanical drawing, miscellaneous, and metalwork, following in that order.

For a list of jobs chosen at random without previous statistics all of the twenty-seven items were checked with amazing frequency. Such frequency indicates a very wide range of possible jobs that an industrial arts teacher may be called upon to perform. There must be a great number of jobs which are not so common with which various industrial arts teachers may be confronted. Surely a large number would not be so difficult or complicated but many are likely to require a broad background of work experience in various trades if they are to be done in an efficient and skillful manner.

Several respondents included letters or notes with their returned questionnaires. One teacher with eighteen years teaching experience stated that he found the experiences listed on the questionnaire just a biginning in the life of an industrial arts teacher. He further stated that a teacher making positive responses to the job check-list makes his department and himself indispensable to the school in which he works.

Communities that have no vocational schools must depend upon industrial arts to give their youth an introduction to the trades. However, it seems as if communities can derive many benefits from a program that calls for the participation of their youth, under the direction of the industrial arts teacher, in an effort to maintain better their schools, community buildings, and the homes in which the students live. Building projects alone in college shop classes does not tend to furnish enough practical work experience to allow for efficient performance on the part of the teacher in such a varied program.

Summer Employment of One Hundred Ten Industrial Arts Teachers

Beside the many functions performed for the school during the school year, it is interesting to see just how the industrial arts teachers spend the summer months. Do they work for the school in repairing and maintaining the buildings? Do they work elsewhere in the field of industrial arts? Do their teaching duties include summer teaching?

The teachers were asked these questions and Table 7 indicates the summer employment of one hundred ten industrial arts teachers. Teachers 5, 38, 75, 92, and 96 failed to answer some of the questions. Four teachers, 4, 21, 48 and 69, indicated that they take part in all three activities.

TABLE 7

SUMMER EMPLOYMENT OF 110 INDUSTRIAL ARTS TEACHERS

Teacher	Are you sometimes employed for a portion of the summer to do any maintenance work on your school plant?		Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?		Do your teaching duties include summer teaching?	
	Yes	No	Yes	No	Yes	No
1		X		X		X
2		X	X			X
3	X			X		X
4	X		X		X	
5	X			X	X	
6	X		X			X
7		X	X			X
8	X		X			X
9	X		X			X
10	X			X		X
11	X		X			X
12		X	X			X
13		X		X		X
14	X		X			X
15		X				X
16	X		X			X
17		X	X			X
18		X	X			X
19	X		X			X
20	X		X			X
21	X		X		X	
22	X		X			X
23		X	X			X
24	X			X		X
25	X		X			X
26		X	X			X
27		X	X			X
28	X		X			X
29	X			X		X
30		X		X		X
31		X	X			X
32	X			X		X
33		X	X			X
34		X	X			X
35	X		X			X
36	X			X		X
37		X	X			X

TABLE 7 (Continued)

TEACHER	Are you sometimes employed for a portion of the summer to do any maintenance work on your school plant?		Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?		Do your teaching duties include summer Teaching?	
	Yes	No	Yes	No	Yes	No
38			X			X
39	X		X			X
40		X	X			X
41	X		X			X
42	X		X			X
43		X	X			X
44	X		X			X
45	X		X			X
46	X			X		X
47		X	X			X
48	X		X		X	
49		X		X		X
50		X	X			X
51		X	X			X
52		X	X			X
53		X	X			X
54	X			X		X
55	X		X			X
56		X	X			X
57		X	X			X
58	X			X		X
59	X		X			X
60	X			X		X
61	X		X			X
62		X	X			X
63		X	X			X
64		X	X			X
65		X	X			X
66	X		X			X
67	X		X			X
68	X		X			X
69	X		X		X	
70	X		X			X
71	X			X		X
72		X	X			X
73	X		X			X
74		X	X			X
75	X		X			
76		X		X		X

TABLE 7 (Continued)

TEACHER	Are you sometimes employed for a portion of the summer to do any maintenance work on you school plant?		Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?		Do your teaching duties include summer teaching?	
	Yes	No	Yes	No	Yes	No
77		X	X		X	
78		X	X			X
79		X		X		X
80		X	X			X
81		X	X			X
82		X	X			X
83	X			X		X
84		X	X			X
85		X		X		X
86	X		X			X
87	X		X			X
88	X			X		X
89		X		X		X
90	X		X			X
91	X			X		X
92						X
93	X			X	X	
94		X		X		X
95		X	X			X
96		X				X
97		X	X			X
98		X	X			X
99		X		X	X	
100		X	X			X
101	X			X		X
102		X	X			X
103		X	X			X
104		X		X		X
105	X			X		X
106		X	X			X
107		X	X			X
108		X		X		X
109		X	X			X
110		X	X			X

Table 8 shows the distribution of the teachers who gave like answers to the series of questions. Four teachers

TABLE 8

DISTRIBUTION OF INDUSTRIAL ARTS TEACHERS ACCORDING TO THEIR COMMON ANSWERS

TEACHER	Are you sometimes employed for a portion of the summer to do any maintenance work on your school plant?		Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?		Do your teaching duties include summer teaching?	
	Yes	No	Yes	No	Yes	No
16	X			X		X
28	X		X			X
4	X		X		X	
1		X	X		X	
1		X		X	X	
11		X		X		X
42		X	X			X
2	X			X	X	

checked "yes" to the series of questions and eleven checked "no" to the entire series. Sixteen are employed for summer maintenance work and do not work elsewhere in the field of industrial arts or teach during summer school. Twenty-eight teachers are employed for summer maintenance work, and also work in the field of industrial arts at other places but do

not teach. Forty-two teachers work elsewhere in the field of industrial arts. Ninety-nine of the one hundred ten teachers, or ninety per cent, work in some phase of industrial arts during the summer. Only ten per cent of the teachers spend their time in other ways.

Table 9 shows the number and per cent of teachers employed in some phase of industrial arts during the summer.

TABLE 9

NUMBER AND PER CENT OF TEACHERS EMPLOYED AT SOME PHASE OF INDUSTRIAL ARTS DURING THE SUMMER

Question	Yes		No	
	Number	Per Cent	Number	Per Cent
Are you sometimes employed for a portion of the summer to do any maintenance work on your school plant?	51	47	57	53
Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?	77	72	30	28
Do your teaching duties include summer teaching?	8	7	101	93

Table 9 shows that forty-seven per cent of the one hundred ten teachers are employed for maintenance work by their schools. Seventy-two per cent work elsewhere at some phase of work considered to be in the field of industrial

arts. Seven per cent teach during summer school. Many of the teachers are included in more than one group, thus accounting for more than one hundred per cent.

This indicates that industrial arts is a twelve-month proposition to most teachers. That is, they spend nearly the entire year working at some phase of industrial arts.

CHAPTER IV

OPINIONS OF INDUSTRIAL ARTS TEACHERS, TEACHER TRAINERS, SUPERVISORS, AND ADMINISTRATORS TOWARD WORK EXPERIENCE

In determining the value of work experience for industrial arts teachers it is well to consult those who are in the field of industrial arts in various capacities. In this chapter, opinions of the following groups toward work experience will be discussed: (1) Teachers of industrial arts, (2) industrial arts teacher trainers, (3) supervisors of industrial arts and (4) administrators of industrial and vocational education.

Questions concerning work experience were included in the questionnaire sent to industrial arts teachers. A battery of ten questions was sent to the teacher trainers, supervisors, and administrators. The first five of these questions were concerned with deficiencies of beginning industrial arts teachers. The last five questions were concerned with correcting the deficiencies caused by lack of work experience on the part of beginning teachers.

Teachers of Industrial Arts

Table 10 shows the responses given by the one hundred ten industrial arts teachers who returned the questionnaires

sent them. Nine teachers failed to give their age and teaching experience, and teacher 23 did not answer the first

TABLE 10

OPINIONS OF INDUSTRIAL ARTS TEACHERS TOWARD WORK EXPERIENCE

TEACHER	AGE	YEARS TEACHING EXPERIENCE	Would you have been better prepared to teach had you spent a portion of your preparatory time in part time work related to the subjects which you teach?		Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does not add to their preparatory time?	
			Yes	No	Yes	No
1	40	19	X		X	
2	46	20	X		X	
3	43	25		X	X	
4	..	..		X	X	
5	28	6	X		X	
6	29	7	X		X	
7	43	22	X		X	
8	46	23	X		X	
9	41	18	X		X	
10	30	8	X		X	
11	..	..	X		X	
12	29	8	X			X
13	..	..	X		X	
14	44	22	X		X	
15	42	18	X		X	
16	46	21	X		X	
17	38	14	X		X	
18	25	1	X		X	
19	41	20	X		X	
20	44	22	X		X	
21	43	20	X		X	
22	35	13	X		X	
23	33	6			X	
24	38	17	X		X	
25	33	8	X		X	
26	30	2	X		X	
27	30	8	X		X	
28	37	15	X		X	
29	41	16	X		X	
30	..	..	X		X	

TABLE 10 (Continued)

TEACHER	AGE	YEARS TEACHING EXPERIENCE	Would you have been better prepared to teach had you spent a portion of your preparatory time in part time work related to the subjects which you teach?		Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does not add to their preparatory time?	
			Yes	No	Yes	No
31	31	6	X		X	
32	37	13	X		X	
33	..	..	X		X	
34	32	3	X		X	
35	31	10	X		X	
36	..	...		X	X	
37	29	1	X		X	
38	30	5	X			X
39	42	14	X		X	
40	40	11	X		X	
41	50	30	X		X	
42	54	29	X		X	
43	36	10	X			X
44	40	17	X		X	
45	25	2	X		X	
46	31	10	X		X	
47	25	5	X		X	
48	44	10		X		X
49	32	6	X		X	
50	34	8	X		X	
51	38	17		X		X
52	25	3	X		X	
53	40	17	X		X	
54	48	26	X		X	
55	25	1	X		X	
56	39	16	X		X	
57	38	16	X		X	
58	41	18	X		X	
59	48	25	X		X	
60	42	20	X		X	
61	28	6	X		X	
62	34	4	X		X	
63	45	23	X		X	
64	26	2	X		X	
65	..	..	X		X	
66	29	6	X		X	

TABLE 10 (Continued)

TEACHER	AGE	YEARS TEACHING EXPERIENCE	Would you have been better prepared to teach had you spent a portion of your preparatory time in part time work related to the subjects which you teach?		Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does not add to their preparatory time?	
			Yes	No	Yes	No
67	47	23	X		X	
68	30	3	X		X	
69	50	23	X		X	
70	57	36	X		X	
71	22	1	X		X	
72	32	12	X		X	
73	37	7	X		X	
74	27	1	X		X	
75	42	23	X		X	
76	45	23	X		X	
77	26	1	X		X	
78	33	8	X		X	
79	48	27	X		X	
80	51	16	X		X	
81	44	25	X		X	
82	38	18	X		X	
83	..	..	X		X	
84	25	2	X		X	
85	24	2	X		X	
86	52	24	X		X	
87	34	13	X		X	
88	42	19	X		X	
89	45	21	X		X	
90	40	14	X			X
91	33	10	X		X	
92	26	1	X		X	
93	26	2	X		X	
94	24	2	X		X	
95	..	..				
96	39	14	X		X	
97	37	12	X		X	
98	47	25	X		X	
99	32	7	X		X	
100	50	20	X		X	

TABLE 10 (Continued)

TEACHER	AGE	YEARS TEACHING EXPERIENCE	Would you have been better prepared to teach had you spent a portion of your preparatory time in part time work related to the subjects which you teach?		Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does not add to their preparatory time?	
			Yes	No	Yes	No
101	36	13	X		X	
102	27	6	X		X	
103	32	11	X		X	
104	36	11	X		X	
105	50	6	X		X	
106	58	26	X		X	
107	37	14	X		X	
108	26	1	X		X	
109	30	10	X		X	
110	41	17		X		X
Total			102	6	102	7

question. Teacher 95 failed to answer either question. The average age of the teachers giving this information is 37.1 years and the average teaching experience is 13.1 years. Teacher 70 has taught thirty-six years and eight teachers have taught one year. To this question, "Would you have been better prepared to teach had you spent a portion of your preparatory time in part-time work related to the subjects which you teach?" one hundred two teachers of the one hundred eight responding answered "yes"; only six answered "no". Those answering "yes" represent ninety-four per cent of the teachers responding. To the second question,

"Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience?", one hundred two teachers answered "yes" also, and only seven teachers answered "no". The teachers answering "yes" again represent ninety-four per cent of all those responding to the question.

Of the teachers answering "no" to the questions, only three were consistent. That is, only three answered "no" to both questions. It is highly improbable that a teacher could answer "yes" to one question and "no" to the other and still be able to back up his response with any valid reasons.

A grouping of the teachers according to teaching experience is shown in Table 11. It is noted that only

TABLE 11

DISTRIBUTION OF TEACHERS ACCORDING TO TEACHING EXPERIENCE

YEARS TEACHING EXPERIENCE	NUMBER OF TEACHERS	Would you have been better prepared to teach had you spent a portion of your preparatory time in part time work related to the subjects which you teach?		Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does not add to their preparatory time?	
		Yes	No	Yes	No
1-5	21	21	0	20	1
6-10	23	21	1	20	3
11-15	15	15	0	14	1
16-20	20	18	2	18	2
21-25	16	15	1	16	0
26-30	5	5	0	5	0
31-35	0	0	0	0	0
36-40	1	1	0	1	0
*	9	6	2	8	0
Total	110	102	6	102	7

*Nine teachers did not give their teaching experience.

twenty-one, or nineteen per cent, of the teachers have taught five years or less. The 6-10 year group contains the largest number of teachers with twenty-three. Fifty-one teachers have taught sixteen or more years. This is fifty per cent of the teachers who gave information concerning age and teaching experience.

Table 11 reveals very little difference in the way the various groups responded to the questions. The only real difference is that no one with over twenty years experience gave a negative answer to the second question and only one gave a negative answer to the first question.

Some teachers added notes in answering the questions on work experience. Some common expressions were: "I did and found such time well worth while". "I had my own furniture shop while in college and have found the experience profitable." "I think work experience should be required." "I spent some time in trades and it was a big help to me."

The teachers as a whole definitely agree that work experience would have been instrumental in making them better teachers, and, they also agree that every beginning industrial arts teacher needs a work-experience background in the subjects he is to teach.

Industrial Arts Teacher Trainers

Teacher trainers should be well aware of some deficiencies of the graduates turned out by their respective institutions. Industrial arts teacher trainers, after four

years of personal contact and after receiving reports on their graduates in the field should be conscious of deficiencies of beginning industrial arts teachers that are caused by lack of work experience in the subjects which they teach.

Eleven teacher trainers made responses to the questionnaire sent them. Table 12 shows how they checked the first five questions which concern deficiencies of beginning teachers.

TABLE 12

DEFICIENCIES OF BEGINNING INDUSTRIAL ARTS TEACHERS AS EXPRESSED BY TEACHER TRAINERS

Teacher Trainer	Do you find beginning industrial arts teachers inadequately trained for the work in many of the phases of industrial arts?		Does lack of work experience in the trades commonly associated with industrial arts account for some of the deficiencies of beginning teachers?		Do beginning teachers express a common desire for trade or job experience?		Do you want industrial arts teachers who are interested in an industrial arts curriculum that is broader than woodwork, metalwork, and mechanical drawing?		Do you find most beginning industrial arts teachers inadequately prepared for work beyond the fields of woodwork, metalwork, and mechanical drawing?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	X		X		*	X	X		X	
2	X		X		*		X		X	
3	X		X				X		X	
4	*		X		X	X	X		X	
5	X		X				X		X	
6		X	X		X	X	X		X	
7			X				X		X	
8	X		X		*		X		*	
9	X			X	X		X		X	
10	X		X		X		X		X	
11	X		X		X		X		X	
Total	9	1	10	1	4	4	11	0	10	0

*Teacher Trainer did not Respond.

Nine teacher trainers, or ninety per cent, find beginning teachers are inadequately trained for work in many phases of industrial arts. Only one checked "no" to this question; one did not respond. Ten, out of the elven responding to question two, find that lack of work experience accounts for some of the deficiencies of beginning teachers. The figure represents ninety-one per cent of those responding to the question. Only one answered in the negative. Teacher trainers, four answering "yes" and four answering "no", failed to reach any kind of an agreement as to whether or not beginning teachers express a common desire for work experience, four answering "yes" and four answering "no". The teachers themselves were overwhelmingly in favor of work experience, however, and the fact that they have not expressed a common desire for it to teacher trainers does not take away from its value. The teacher trainers are unanimous on questions 4 and 5. That is, they all want teachers who are interested in a curriculum that is broader than woodwork, metalwork, and mechanical drawing; and they all find that beginning teachers are inadequately prepared to do good work beyond these three divisions.

Now that lack of work experience has been agreed upon by teacher trainers as causing some of the deficiencies of beginning teachers, recommendations as expressed by the same group will be discussed.

Table 13 shows the recommendations for work experience as expressed by teacher trainers.

TABLE 13

RECOMMENDATIONS FOR WORK EXPERIENCE AS EXPRESSED BY TEACHER TRAINERS

Teacher Trainer	Would work experience in various trades on the part of the teacher add enrichment to teaching efforts in industrial arts subjects?		Would part time jobs at various trades while in college tend to eliminate apparent lack of experience of the beginning teacher?		Would you prefer a practice whereby students receive pay for working at various trades while in college?		Would you prefer a practice whereby students receive school credit for working at various trades while in college?		If work experience is available, should it be required of all prospective industrial arts teachers?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	X		X		X		X		X	
2	X		X			X	X			X
3	X			X	X			X		
4	X		X		X		X		X	
5	X		X		X			X	X	
6	X		X		*		X			
7	X		X		X			X		X
8	X		X		X			X		
9	*		*			X		X	*	
10	X		*		X		X		X	
11	X		X		X		X		X	
Total	10	0	8	1	8	2	5	6	6	2

*Teacher Trainer did not Respond.

Teacher trainers agree one hundred per cent that work experience would add enrichment to teaching efforts, and express the opinion by a majority of eight to one that part-

time jobs at various trades while in college would tend to eliminate apparent lack of experience on the part of the beginning teacher. One did not respond to the former question, which is question one in Table 13, and two did not respond to the latter, question two. They further agree, by eight to two, that they prefer a practice whereby students receive pay for working at various trades while in college. They are about evenly divided on the question of granting credit to students for working while in college, five being willing to grant credit and six preferring not to grant credit.

Six teacher trainers say if work experience is available, it should be required of all prospective industrial arts teachers, and two say that it should not be required. Three did not respond to this last question.

As Table 13 clearly shows, the ten teacher trainers expressed opinions that work experience will help add enrichment to the teaching of industrial arts; that part-time jobs while in college would tend to eliminate apparent lack of experience; that a practice whereby students receive pay for working at various trades while in college is desirable; and that if work experience is available, it should be required. They express a slight preference for not granting school credit for work experience.

Industrial Arts Supervisors

Many of the larger school systems of Texas have supervisors to aid in administering the industrial arts program within the school system. These men usually have had a very

successful teaching career over a period of years before being appointed to such positions. They are careful to see that beginning teachers get off to a good start.

Table 14 gives the answers of supervisors concerning deficiencies of beginning industrial arts teachers.

TABLE 14

DEFICIENCIES OF BEGINNING INDUSTRIAL ARTS TEACHERS AS EXPRESSED BY SUPERVISORS

Supervisor	Do you find beginning industrial arts teachers inadequately trained for the work in many of the phases of industrial arts?		Does lack of work experience in the trades commonly associated with industrial arts account for some of the deficiencies of beginning teachers?		Do beginning teachers express a common desire for trade or job experience?		Do you want industrial arts teachers who are interested in an industrial arts curriculum that is broader than woodwork, metalwork, and mechanical drawing?		Do you find most beginning industrial arts teachers inadequately prepared for work beyond the fields of woodwork, metalwork, and mechanical drawing?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	X		X			X	X		X	
2	X		X			X	X		X	
3	X		X			X	X		X	
4	X		X			X	X		X	
5	X		X			X	X		X	
6	X		X		X		X		X	
7	X		X		X		X		X	
8	X		X			X	X		X	
9		X	X		X		X		X	
10	X				X		X		X	
11	X			X		X	X			X
Total	10	1	10	1	4	7	11	0	10	1

Ten of the eleven supervisors, which is ninety-one per cent of those returning the questionnaires, find that beginning teachers are inadequately trained for work in many phases of industrial arts. One supervisor reports that beginning teachers are not inadequately trained. They report by the same percentages that lack of work experience accounts for some of the deficiencies of beginning teachers. Seven, or sixty-four per cent, report that beginning teachers do not express a common desire for work experience, as against four who report that they do.

Supervisors are one hundred per cent in agreement on the next question, as all eleven want teachers who are interested in a curriculum that is broader than woodwork, metal work, and mechanical drawing. Yet ten of the eleven report that beginning teachers are not adequately prepared to work beyond these three phases of work.

As to the recommendations supervisors make concerning work experience, all eleven agree that it would add enrichment to teaching efforts in industrial arts. Nine supervisors think that part time jobs at various trades while in college would tend to eliminate apparent lack of experience of the beginning teacher while two think that it would not. By the same figures, they prefer a practice whereby students receive pay for working at various trades while in college. They also prefer, by ten to one, a practice of giving college credit for the same type of work, and by the same figures,

ten to one, they agree that if work experience is available, it should be required of all prospective industrial arts teachers.

Table 15 show the recommendations for work experience as expressed by the supervisors.

TABLE 15

RECOMMENDATIONS FOR WORK EXPERIENCE AS EXPRESSED BY SUPERVISORS

Supervisor	Would work experience in various trades on the part of the teacher add enrichment to teaching efforts in industrial arts subjects?		Would part time jobs at various trades while in college tend to eliminate apparent lack of experience of the beginning teacher?		Would you prefer a practice whereby students receive pay for working at various trades while in college?		Would you prefer a practice whereby students receive school credit for working at various trades while in college?		If work experience is available, should it be required of all prospective industrial arts teachers?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	X		X		X		X		X	
2	X		X		X	X	X		X	
3	X		X		X		X		X	
4	X		X		X		X		X	
5	X		X		X		X		X	
6	X		X	X	X	X	X		X	
7	X		X		X		X		X	
8	X		X		X		X		X	
9	X		X		X		X		X	
10	X		X		X		X		X	
11	X		X	X	X		X	X		X
Total	11	0	9	2	9	2	10	1	10	1

Supervisors are in accord with the teacher trainers in agreeing that lack of work experiences cause many of the deficiencies of beginning teachers, and they also agree with them that it should be required of prospective teachers as an aid in eliminating some of these deficiencies.

Administrators of Industrial Arts and Vocational Education

In order to obtain a more complete coverage of persons in the state who are well informed in the field of industrial arts, state directors and administrators of industrial and vocational education in the state department of education were also consulted on the matter of work experience for industrial arts teachers. The four individuals who were thus consulted are in contact with supervisors and teacher trainers as well as the teachers themselves.

They were unanimous in their opinions, as is shown in Table 16, that beginning industrial arts teachers are inadequately trained for work in many phases of their field; that lack of work experience causes many deficiencies of beginning teachers; and that they want industrial arts teachers who are interested in a curriculum that is broader than woodwork, metalwork, and mechanical drawing. They all find, however, that industrial arts teachers are not adequately trained for work beyond these fields.

Table 16 shows the deficiencies of beginning industrial arts teachers as expressed by the administrators.

TABLE 16

DEFICIENCIES OF BEGINNING INDUSTRIAL ARTS TEACHERS AS EXPRESSED BY ADMINISTRATORS

Administrator	Do you find beginning industrial arts teachers inadequately trained for the work in many of the phases of industrial arts?		Does lack of work experience in the trades commonly associated with industrial arts account for some of the deficiencies of beginning teachers?		Do beginning teachers express a common desire for trade or job experience?		Do you want industrial arts teachers who are interested in an industrial arts curriculum that is broader than woodwork, metalwork, and mechanical drawing?		Do you find most beginning industrial arts teachers inadequately prepared for work beyond the fields of woodwork, metalwork, and mechanical drawing?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	X		X			X	X		X	
2	X		X			X	X		X	
3	X		X			X	X		X	
4			X			X	X			
Total	4	0	4	0	0	4	4	0	4	0

As for recommendations, the administrators still agree unanimously that work experience on the part of the teacher would add enrichment to teaching efforts; that part-time jobs would tend to eliminate apparent lack of work experience of the beginning teacher; and, if work experience is available, it should be required of all prospective industrial arts teachers. All four administrators prefer a practice

whereby students receive pay for working at various trades while in college, but only three of the four approve of giving college credit for the same type of work. Table 17 points out these facts.

TABLE 17

RECOMMENDATIONS FOR WORK EXPERIENCE AS EXPRESSED BY ADMINISTRATORS

Administrator	Would work experience in various trades on the part of the teacher add enrichment to teaching efforts in industrial arts subjects?		Would part time jobs at various trades while in college tend to eliminate apparent lack of experience of the beginning teacher?		Would you prefer a practice whereby students receive pay for working at various trades while in college?		Would you prefer a practice whereby students receive school credit for working at various trades while in college?		If work experience is available, should it be required of all prospective industrial arts teachers?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1 2 3 4	X X X X		X X X X		X X X X		X	X X X	X X X X	
Total	4	0	4	0	4	0	1	3	4	0

A Comparison of Opinions Expressed by Industrial Arts Teachers, Teacher Trainers, Supervisors, and Administrators

Table 18 shows a comparison of the opinions of teacher trainers, supervisors, and administrators on the deficiencies of beginning industrial arts teachers.

TABLE 18

COMPARISON OF OPINIONS OF TEACHER TRAINERS, SUPERVISORS, AND ADMINISTRATORS ON DEFICIENCIES OF BEGINNING INDUSTRIAL ARTS TEACHERS

Group	Do you find beginning industrial arts teachers inadequately trained for the work in many of the phases of industrial arts?		Does lack of work experience in the trades commonly associated with industrial arts account for some of the deficiencies of beginning teachers?		Do beginning teachers express a common desire for trade or job experience?		Do you want industrial arts teachers who are interested in an industrial arts curriculum that is broader then woodwork, metalwork, and mechanical drawing?		Do you find most beginning industrial arts teachers inadequately prepared for work beyond the fields of woodwork, metalwork, and mechanical drawing?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Teacher Trainers	9	1	10	1	4	4	11	0	10	0
Supervisors	10	1	10	1	4	7	11	0	10	1
Administrators	4	0	4	0	0	4	4	0	4	0
Total*	23	2	24	2	8	15	26	0	24	1

*Difference in totals on the various questions is due to the fact that some respondents did not answer one or more questions.

In reviewing the data presented in this chapter, it is found that ninety-four per cent of the industrial arts teachers responding to the questions say they would have been better prepared to teach had they spent a portion of their preparatory time in part-time work related to the subjects which they teach; and ninety-four per cent of these same teachers go so far as to recommend that prospective industrial arts teachers be given opportunity for work experience if it does not add to their preparatory time.

Ninety-two per cent, as is shown in question one of Table 18, of the teacher trainers, supervisors, and administrators combined, say that lack of work experience in the trades commonly associated with industrial arts accounts for some of the deficiencies of beginning teachers.

As shown in Table 19, one hundred per cent of these three groups say that work experience in the various trades would add enrichment to teaching efforts in the industrial arts program. Eighty-seven and five-tenths per cent of these combined groups are of the opinion that part-time jobs at various trades while in college would tend to eliminate apparent lack of experience of the beginning teachers; and eighty-three per cent of them say if work experience is available it should be <u>required</u> of <u>all</u> prospective industrial arts teachers.

TABLE 19

COMPARISON OF OPINIONS OF TEACHER TRAINERS, SUPERVISORS, AND ADMINISTRATORS ON RECOMMENDATIONS FOR WORK EXPERIENCE

Group	Would work experience in various trades on the part of the teacher add enrichment to teaching efforts in industrial arts subjects?		Would part time jobs at various trades while in college tend to eliminate apparent lack of experience of the beginning teacher		Would you prefer a practice whereby students receive pay for working at various trades while in college?		Would you prefer a practice whereby students receive school credit for working at various trades while in college?		If work experience is available, should it be required of all prospective industrial arts teachers?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Teacher Trainers	10	0	8	1	8	2	5	6	6	2
Supervisors	11	0	9	2	9	2	10	1	10	1
Administrators	4	0	4	0	4	0	1	3	4	0
Total*	25	0	21	3	21	4	16	10	20	3

*Difference in totals on the various questions are due to the fact that some respondents did not answer one or more questions.

Both the teachers and the teacher trainers, supervisors and administrators are highly in favor of work experience for prospective industrial arts teachers. The teachers are

even more nearly unanimous in their agreement than are the latter groups. Now, the big question which should be of much concern to the teacher-training institutions is, do they have the opportunities and methods for making work experience available to prospective industrial arts teachers?

CHAPTER V

OPPORTUNITIES AND METHODS FOR PROVIDING WORK EXPERIENCE

Opportunities

In an institution such as North Texas State Teachers College there should be found many opportunities for providing work experience for students who are in training to become industrial arts teachers. At this writing this institution is composed of twenty-one buildings of brick, tile and concrete constructions, and some forty buildings of frame construction.

There is also other equipment such as laboratory apparatus, classroom chairs and desks, shelves, bookcases, museum cases, office equipment and many more items. There are three large kitchens and dining halls fully equipped, with another under construction. There are automobiles, trucks, power mowers and other machinery to maintain and repair. Fans, electric motors and other electrical appliances are constantly in need of attention.

All maintenance and repair work, along with building alterations and the construction of new equipment, constitute a major item in the college budget. About one hundred thousand dollars is spent annually for these items.

Many of the opportunities for work experience can be classed under phases or units that are considered to be in the field of industrial arts. These different types of work include; (1) electricity, (2) automobile mechanics, (3) carpentry and construction, (4) cabinet making and mill work, (5) sheetmetal, (6) bench metal, (7) welding, (8) plumbing, (9) building maintenance, (10) concrete, mortar, and brick work, (11) machine shop, (12) printing, (13) finishing and refinishing, (14) drafting and design, and (15) surveying, landscaping and flood control. A brief description of work that could be done in these fields follows:

(1) Electrical work on the campus would include checking and repairing motors to fans, shop machinery, kitchen appliances, sewing machines, water coolers and other similar equipment. Checking for shorts in light circuits, replacing burned out fuses, repairing switches and extensions would also be included. Altering circuits, running new circuits and replacing deteriorated electrical wiring, along with numerous miscellaneous jobs, would also need to be done.

(2) The upkeep of automobiles, trucks, power lawn mowers, and other portable engines offers work in most of the phases of automobile mechanics. The preventive maintenance alone for these vehicles is a continuous task. Doing overhauls and repairs that could be made in a garage with a minimum of equipment would be invaluable to a person who later is to teach automobile mechanics.

(3) Carpentry and construction work make up a great deal of the woodwork done on the campus. There is the repair work to be done to the wooden construction in all of the buildings. There are alterations of partitions and openings to be made. Construction work of both a permanent or a temporary nature is in constant demand. The repairing of roofs, floors and windows are probably the largest items in carpentry repair.

(4) Cabinet making and mill work is called for both in making new furnishings and repairing old ones. Items such as desks, tables, shelves, book cases, cabinets, and showcases are made in the cabinet shop. New or replacement doors, window sashes, door and window frames, and trimming materials are part of the mill work to be done.

(5) Sheet metal repairs are done on roofs around chimneys, ventilators, and louvers. There are also to be repaired or replaced cabinet tops, vats and drains in the science laboratories, flashing and termite shields on the frame structures, metal-top tables, down spouts and gutters. Any number of small jobs and soldering jobs also need to be done.

(6) Bench metal work is required in making repairs to devices such as door closers, hinges, metal brackets, metal beds, mechanical kitchen equipment and sharpening all kinds of cutting tools. Making or repairing metal parts for any other equipment requires bench metalwork.

(7) Welding is required in rejoining broken parts made from the common metals. It is also used in the fabrication and joining of metal in all types of metal construction.

(8) Plumbing is a major item in the maintenance of an institution that contains living quarters, kitchens, and bathroom facilities. There are faucets to repair, valves to replace, old pipe to replace, showers and flushing apparatus to repair and new lines to run. There are also steam lines and radiators to maintain.

(9) Building maintenance would include a program of periodical inspections of roofs, foundations, hidden structures, and partitions, with emphasis upon looking for leaks, dry rot, termites, cracks and shifting of structural members. Inspections would also be made for cleanliness in such places as kitchens and restrooms, and safety around fire escapes, stairways and ceilings.

(10) Work in either repairs or new construction is always in demand in concrete, brickwork, mortar and plastering. There are concrete steps, sidewalks, terraces or drainage sewers to be constructed. Brick and tile walls need repairing or altering. Plaster walls need patching and new partitions need building or old ones torn out and smoothed.

(11) Machine shop work may be necessary on metal parts made or repaired in any of the other phases of work. Automobile parts may need turning, polishing or grinding. Shafts for any mechanical equipment may need to be turned down and

fitted. Other parts often need to be shaped or drilled in order to fit properly. Some machines used in machine shops are lathes, drill presses, grinders, portable electric drills, presses, punches, shapers and milling machines.

(12) A print shop could do all printing required by the college. Several items that could be printed include tablet forms, all miscellaneous forms, bulletins, newspapers and annuals. Work experience in a print shop where the above items are printed would be very valuable to a prospective teacher of printing.

(13) Finishing new construction and refinishing old construction are required almost continuously. Outside and inside painting is in progress when weather permits. Staining, filling and varnishing of new cabinet construction is required. Persons working in a paint shop get experience in handling and mixing paint, varnish, shellac, lacquer and paint and varnish removers. They also learn the best finishes for the different kinds of woods.

(14) There is a constant need for the designing and drafting of plans for equipment to be made in the shops, or construction or alterations to be made on the buildings. Much time can be saved by the shop mechanic if drawings are available for items that are to be constructed.

(15) In the field of surveying, landscaping, and flood control there is much work to be done, especially if new construction is underway or has recently been completed. There

are sidewalks and drainage ditches to lay out, curbs and terraces to line off and even underground storm sewers to run. This work also needs to be done around playgrounds, tracks, parking lots and similar places. Grade lines for new buildings or buildings to be moved are also required.

Some of the above phases of work can be combined in the process of establishing the various maintenance shops or departments. There should be a general woodshop which would include carpentry, cabinet making and mill work, building maintenance, and concrete, mortar, and brick work; a general metalshop would include bench metal, sheet metal, welding and machine shop. The paint shop would take care of refinishing as well as finishing. The plumbing shop, electrical shop, and automobile garage would stand as separate units, as would the paint shop. Designing and drafting, along with surveying, landscaping and flood control layout, would well fit into a drafting and planning department.

All of the shops from which workers must go to all parts of the physical plant of the college in order to perform their jobs should have a central location if it is at all possible. A warehouse in connection with the shops would be desirable.

Due to the fact that many industrial arts teachers are required to teach several different units in their field, it would be well to have students gain work experience in as many of the above phases as possible. It would also be

advisable to establish a minimum and maximum limit for the number of hours a student can spend in each phase. Each phase should be weighted as to the comparative length of time required to gain a certain degree of skill and as to the importance of the particular phase of work in the industrial arts curriculum. For example, cabinet making and mill work may be given a minimum weight of five hundred hours, whereas concrete, mortar, and brickwork may be allotted a minimum of only two hundred hours. Methods of administering a program of this type will be discussed later.

Other opportunities for gaining work experience are not confined to the teacher training institutions. Time spent working in various trades and industries considered to be in the field of industrial arts will tend to add skill and knowledge to abilities of the prospective industrial arts teacher. These jobs may be part-time while in school or may be summer jobs between school terms.

Some of the jobs at which a prospective industrial arts teacher could work and at the same time build up a work experience background are cabinet maker, furniture maker, carpenter, painter, draftsman, electrician, welder, machinist, upholsterer, patternmaker, sheetmetal worker and architect. Others may include concrete finisher, brick mason, auto mechanic, lumber yard clerk, plumber, machinery supply clerk, material supply clerk, engineer, and building or trade foreman.

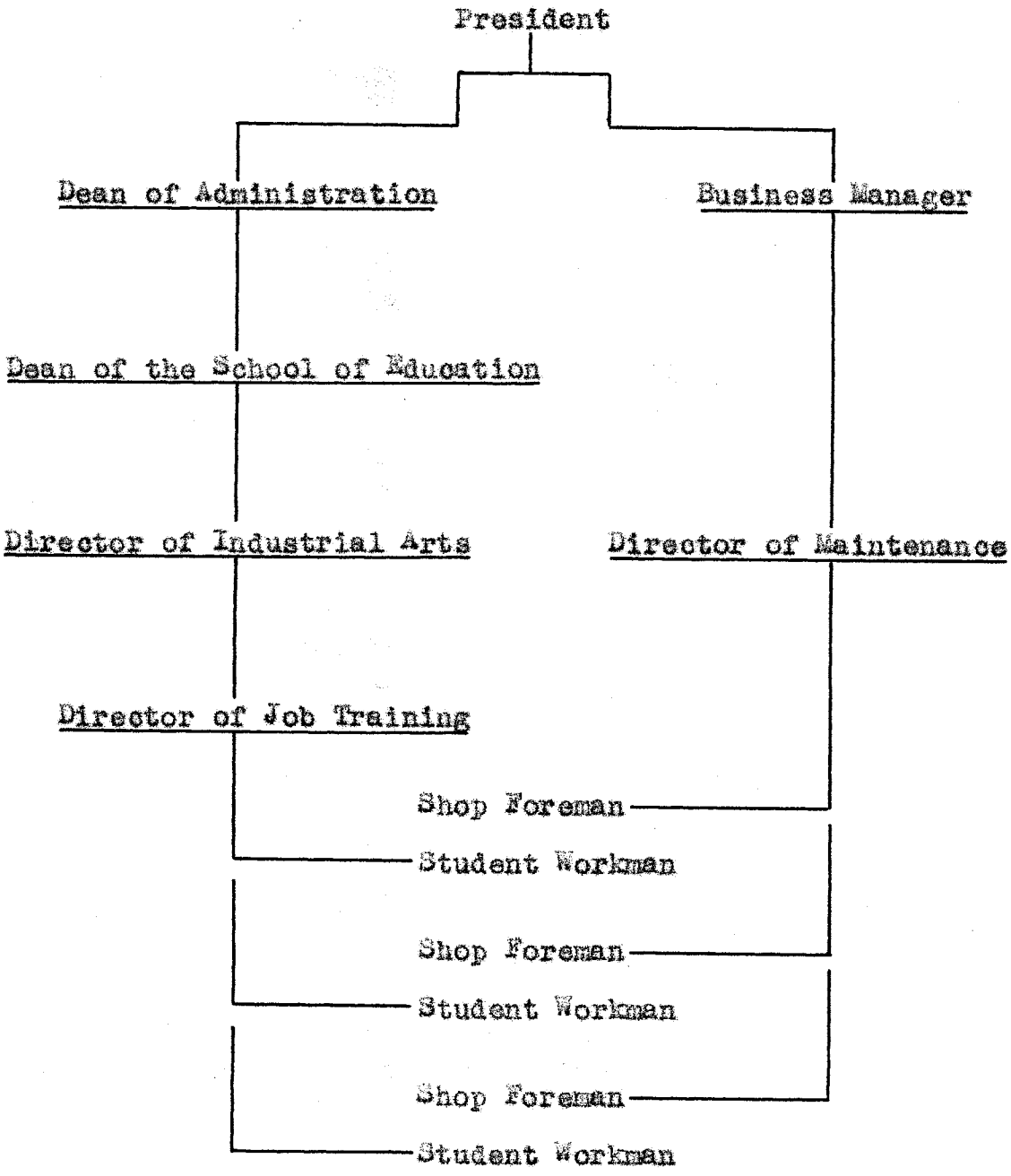
Methods

Methods used in administering any training program often will determine its success or failure. A most undesirable method from the standpoint of training is one in which there is no supervision or guidance on the part of a qualified teacher trainer. In order to administer adequately a work experience training program such as is mentioned at the beginning of the chapter, there should be a well-planned chain of authority from the highest administrative officials down to the student who is participating in the program. This authority should work in two directions. First, there are the policies concerning the financial abilities of the college as to the type and amount of maintenance work to be done. Starting in the office of the president, these policies are carried on by the business office, the superintendent of maintenance, the respective shop foreman, and are terminated by the person who actually performs the work.

As to the training of prospective teachers, the policies again may be approved in the office of the president or originated by him. This chain leads through the dean of administration, dean of the school of education, director of the department of industrial arts, director of job training, and this time terminates with the prospective industrial arts teacher who is gaining a work-experience background by working in one of the maintenance shops. Figure 1 shows a schematic diagram of the administration of a work experience program.

Figure 1

THE ADMINISTRATION OF A WORK EXPERIENCE PROGRAM



Granting that all administrative officials of the college are sympathetic toward, and have confidence in a work experience program for prospective industrial arts teachers, the burden of responsibility for the success of such a program must fall directly upon the industrial arts department. However, in order to have more effective training, the director of maintenance and all of the shop foremen must not only be well qualified for their duties, both in training and efficiency, but must be able to work with and help young men who have had little or no experience to become proficient in their work. Although not trained as teachers, they must be capable of guiding and directing the young worker so that his growth in work experience will be profitable.

Although the director of job training should be the general counselor for the industrial arts department, the director of the department with the aid of his entire staff should recommend or approve of the policies concerning this job training. Some of the duties of the director of job training besides being one of the regular members of the industrial arts faculty might include:

1. Act as personnel guidance director of industrial arts majors.

2. Keep personnel records concerning work experience, industrial arts courses completed, and teacher recommendations of all students of sophomore standing or above.

3. Arrange for placing and rotating the students in the various shops in a manner that will insure a broad work-experience background to all participants.

4. Determine if the work experiences the students are receiving are of a nature that will increase their knowledge and efficiency in some phase of industrial arts.

5. Act as coordinator between shop foreman and students when it is necessary to gain better production or better training.

6. With the aid or approval of the department as a whole, weigh each phase of work as to its difficulty and its general worth to an industrial arts curriculum.

7. Teach a course or courses in production methods in some of the phases of work, i.e., carpentry, cabinet making, concrete work and other related courses.

8. See that participation on the part of the student is not so great as to be a detriment to other college work.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The findings of this study may be briefly summarized as follows:

1. One hundred ten (sixty-seven per cent) of the one hundred sixty-three high school industrial arts teachers of Texas to whom they were mailed, answered and returned the questionnaires used in this study. Eleven (ninety-two per cent) each of the supervisors and teacher trainers and four (one hundred per cent) of the administrators of the state department of education responded to the questionnaires sent them concerning deficiencies of and recommendations for beginning industrial arts teachers.

2. Ninety-nine per cent of the teachers reported that at least one or more units of woodwork are offered in their schools; ninety-nine per cent reported at least one or more units of mechanical drawing are offered; sixty-one per cent reported one or more units of metal work are offered. Fifty-six per cent report offerings in all three divisions.

3. Of the miscellaneous units, electricity was reported

by twenty-nine per cent of the teachers, handicrafts by twenty-seven per cent, pipe work and plumbing by sleven per cent, and concrete work by only four per cent.

4. Under the division of woodwork, ninety-nine per cent of the teachers reported that hand woodwork and wood turning were offered in the schools in which they teach. Ninety-six per cent reported finishing; ninety-three per cent reported machine woodwork; seventy-eight per cent reported refinishing. The other subjects in order of their frequency were carpentry, wood carving, and patternmaking.

5. In the division of mechanical drawing seventy-eight per cent of the teachers reported freehand sketching; seventy-seven per cent reported machine drawing; sixty-five per cent reported architectural drawing; sixty-two per cent reported blue printing; sixty per cent reported developing (sheet metal); and, fifty-four per cent reported cabinet and furniture design.

6. In the division of metal work forty-seven per cent reported bench metal; forty-five per cent reported sheet metal; forty per cent reported welding; thirty-nine per cent reported machine shop; and thirty-five per cent reported forging. Automobile mechanics and farm shop were reported by twenty-two and fourteen per cent, respectively.

7. Two schools offer twenty-two of the twenty-five units and eight schools offer twenty or more units. Sixty-four per cent of the schools offer eleven or more. The average offering of the schools represented is approximately

thirteen units. Only three schools offer less than five.

8. Ninety-seven per cent of the teachers responding indicate they perform some functions in connection with constructing, maintaining and repairing equipment and apparatus for the schools in which they teach. Eighty-two per cent of the teachers indicate that they take considerable part in the performance of these functions.

9. Forty-seven per cent of the teachers responding indicate that they are employed for a portion of the summer to do maintenance work on their school plant. Seventy-two per cent work elsewhere during the summer at some phase of work considered to be in the field of industrial arts, and seven per cent teach in summer school. The total number of teachers included in the three groups is ninety-nine or ninety per cent of all the teachers responding. Ten per cent of the teachers do other than industrial arts work during the summer.

10. The average age of the industrial arts teachers responding to the questionnaires is thirty-seven and one-tenth years, and the average teaching experience is thirteen and one-tenth years.

11. Ninety-four per cent of the teachers reported that they would have been better prepared to teach had they spent a portion of their preparatory time in part time work related to the subjects which they teach.

12. Ninety-four per cent of the teachers recommend

that prospective industrial arts teachers be given opportunities for practical work experience.

13. Ninety per cent of the teacher trainers find beginning industrial arts teachers inadequately trained for work in many phases of industrial arts; ninety-one per cent reported that lack of work experience accounts for some of the deficiencies of beginning teachers; one hundred per cent want teachers who are interested in a curriculum that is broader than woodwork, metal work and mechanical drawing; and, one hundred per cent find that beginning teachers are inadequately prepared to do good work beyond these three divisions.

14. Teacher trainers agree one hundred per cent that work experience in the various trades on the part of the teacher would add enrichment to teaching efforts in industrial arts subjects; eighty-eight per cent agree that part-time jobs at various trades while in college would tend to eliminate apparent lack of experience on the part of the beginning teacher; and, eighty per cent prefer a practice whereby students receive pay for working at various trades while in college. Seventy-five per cent of the teacher trainers say if work experience is available, it should be required of all prospective industrial arts teachers.

15. Of the eleven industrial arts supervisors responding, ninety-one per cent find beginning teachers inadequately trained for work in many of the phases of industrial arts;

ninety-one per cent reported that lack of work experience accounts for some of the deficiencies of beginning teachers; one hundred per cent want teachers who are interested in a curriculum that is broader than woodwork, metal work, and mechanical drawing; and, ninety-one per cent report that beginning teachers are not adequately prepared to work beyond these three phases.

16. Supervisors agree one hundred per cent that work experience in the various trades on the part of the teacher would add enrichment to teaching efforts in industrial arts subjects; eighty-two per cent agree that part-time jobs at various trades while in college would tend to eliminate apparent lack of work experience on the part of the beginning teacher; and ninety-one per cent agree that if work experience is available, it should be required of all prospective industrial arts teachers.

17. Administrators are unanimous in their agreement that beginning teachers are inadequately trained for work in many phases of industrial arts; that lack of work experience causes many deficiencies of beginning teachers; and that they want industrial arts teachers who are interested in a curriculum that is broader than woodwork, metalwork, and mechanical drawing. They all find, however, that beginning industrial arts teachers are not adequately trained beyond these fields.

18. Administrators also agree unaminously that work

experience on the part of the teacher would add enrichment to teaching efforts; that part-time jobs at various trades while in college would tend to eliminate apparent lack of experience of the beginning teacher; and, that if work experience is available it should be required of all industrial arts teachers.

Conclusions

The following conclusions have been gained from this study:

1. Beginning industrial arts teachers can expect to be called upon to teach several units in the field of industrial arts.

2. Beginning industrial arts teachers can expect to be called upon to perform maintenance and repair jobs for their schools.

3. Work experience in various trades is a valuable part of the training of industrial arts teachers.

4. Industrial arts teachers will be better prepared to teach if they spend a portion of their preparatory time in part-time work related to the subjects which they are to teach.

5. Beginning industrial arts teachers are not adequately trained in many of the phases of industrial arts.

6. Industrial arts teachers should be interested in a curriculum that is broader than woodwork, metalwork and mechanical drawing.

Recommendations

The following recommendations are offered:

1. Work experience should be made available to prospective industrial arts teachers during their preparatory period of training.

2. Work experience should be as varied as is practicable.

3. There should be a maintenance system planned that will allow for full participation on the part of all industrial arts students.

4. A regular member of the industrial arts faculty should be in charge of job training for its students.

5. There should be a minimum work experience requirement for all industrial arts majors who earn a teaching certificate.

6. All prospective industrial arts teachers should be well trained in woodwork, mechanical drawing, and metal work, as over fifty per cent of all schools offer work in all three of these phases.

7. A minimum of six hours should be offered in electricity and the same number in handicrafts, as almost one third of the schools offer these subjects.

Suggested Studies

Further study along this line is suggested as follows:

1. There should be a study made to determine what

specific phases of work experience are the most desirable for prospective industrial arts teachers.

2. There should be a follow-up study made of all graduates who teach industrial arts to determine the effectiveness of a work-experience background.

APPENDIX

Form 1

Dear Sir:

I am making a study of the value of practical work experience as a part of the training of Industrial Arts teachers. It is my desire to obtain information from you concerning your job as a teacher of Industrial Arts.

A knowledge of the subjects you teach and what related functions you perform at your school is very important to this study. Your opinion on the questions in Part III is especially valuable in determining the attitudes of the teachers in your field toward practical work experience.

Will you kindly fill out the enclosed questionnaire and return same in the self-addressed stamped envelope as soon as possible.

Sincerely yours,

John Karnes

Form 2

_____ Age _____ Years Teaching Experiance

Part I

Place a check (✓) mark by the items that are included in any of the Industrial Arts courses offered in your school.

Woodworking

_____1. Hand Woodworking
_____2. Machine Woodworking
_____3. Carpentry
_____4. Wood turning
_____5. Pattern making
_____6. Wood Carving
_____7. Finishing
_____8. Refinishing

Drawing

_____1. Free hand sketching
_____2. Machine drawing
_____3. Developing (sheet metal etc.)
_____4. Architectural drawing
_____5. Cabinet and furniture design
_____6. Blue printing

Metal Work

_____1. Bench metal
_____2. Forging
_____3. Machine shop
_____4. Welding
_____5. Sheet metal
_____6. Farm shop
_____7. Auto mechanics

Miscellaneous

_____1. Electricity
_____2. Concrete work
_____3. Handicrafts
_____4. Pipe work and plumbing

Part II

Teachers are sometimes asked to assist in functions at school that fall within the scope of their teaching field and experience. Please check (✓) the items listed in Part II that indicate the types of work which you or your classes have been called upon to do.

Are you sometimes asked to:

1. Woodwork

_____1. Build book shelves for your school?
_____2. Help build stage equipment and scenery?
_____3. Plane off doors.
_____4. Replace broken window panes.
_____5. Repair or build playground equipment.

_____6. Repair equipment and apparatus in the gymnasium.
_____7. Repair loose hinges.
_____8. Repair or make bulletin boards and picture frames.
_____9. Repair a broken chair.

2. Mechanical drawing

_____1. Layout playground areas.
_____2. Draw projects for students to build.
_____3. Sketch or draw out something a teacher or the school wants to build.
_____4. Draw plans for an addition or repairs to your school plant.
_____5. Make charts or posters for the school.
_____6. Figure floor space in your school building.

3. Metal work

_____1. Repair door closers.
_____2. Weld broken equipment.
_____3. Tighten a leaky pipe.
_____4. Solder a broken instrument.
_____5. Sharpen cutting tools.
_____6. Straighten bent playground equipment or other apparatus.
_____7. Make sheet metal repairs.
_____8. Repair yard tools.

4. Miscellaneous

_____1. Advise or help in concrete and mort r work.
_____2. Replace burned out fuses.
_____3. Repair faulty electric extensions, outlets, or switches.
_____4. Oil electric motors or fans.

Part III

Please check (✓) yes or no to the following questions:

YES	NO	
___	___	1. Are you sometimes employed for a portion of the summer to do any maintenance work on your school plant?
___	___	2. Do you work elsewhere during the summer at some phase of work considered to be in the field of Industrial Arts?
___	___	3. Do your teaching duties include summer teaching?

YES	NO	
___	___	4. Would you have been better prepared to teach had you spent a portion of your preparatory time in work related to the subjects which you teach?
___	___	5. Would you recommend that prospective industrial arts teachers be given opportunity for practical work experience while in college if it does <u>not</u> add to their preparatory time?

Form 3

Dear Sir:

I am making a study of the value of practical work experience as a part of the training of industrial arts teachers. It is my desire to obtain information from teacher-trainers and administrators concerning the proficiency of beginning Industrial Arts teachers.

It is important that teacher-trainers and administrators or supervisors be consulted when studies are being made concerning the preparation of teachers.

Will you kindly fill out the enclosed questionnaire and return same in the self-addressed stamped envelope as soon as possible.

Sincerely yours,

John Karnes

Form 4

As a public school administrator or an Industrial Arts teacher-trainer, will you please check (✓) yes or no to the following questions:

YES	NO	
___	___	1. Do you find beginning Industrial Arts teachers inadequately trained for the work in many of the phases of Industrial Arts?
___	___	2. Does lack of work experience in the trades commonly associated with Industrial Arts account for some of the deficiencies of beginning teachers?
___	___	3. Do beginning teachers express a common desire for trade or job experience?
___	___	4. Do you want Industrial Arts teachers who are interested in an Industrial Arts curriculum that is broader than Woodwork, Metalwork, and Mechanical Drawing?
___	___	5. Do you find most beginning Industrial Arts teachers inadequately prepared for work beyond the fields of Woodwork, Metalwork, and Mechanical Drawing?
___	___	6. Would work experience in various trades on the part of the teacher add enrichment to teaching efforts in Industrial Arts subjects?
___	___	7. Would part-time jobs at various trades while in college tend to eliminate apparent lack of experience of the beginning teacher?
___	___	8. Would you prefer a practice whereby students received pay for working at various trades while in college?
___	___	9. Would you prefer a practice whereby students receive school credit for working at various trades while in college?
___	___	10. If work experience is available, should it be required of all prospective Industrial Arts teachers?

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